



CHITTAGONG MEDICAL UNIVERSITY JOURNAL

Volume 02 Issue 01 March 2022

Editorial

- Philosophical Aspects of Education □ 1
✉ *M I Khan*

Commentaries

- Consequences of Polypharmacy in the Elderly □ 5
✉ *S Paul*

Review Article

- Dengue Fever : A Review □ 8
✉ *J Das*

Original Articles

- Immunohistochemical Overexpression of P53 Protein in Premalignant and Malignant Uterine Cervical
□ Lesion at Chittagong Medical College □ 15
□ *I Sultana F U Ahmed*
- A Comparative Study of Clinicobacteriological Profile of Sepsis between Neonatal (0-28 days) and
□ Post Neonatal Age (29-90 days) in a Non-Government Medical College Hospital □ 20
□ *R Ahmed M N Huda Q-E-Elahi E E Ullah F Akter M M Uddin*
- Study on Prevalence of Non Communicable Diseases among the Expatriates Attending in
□ Chattagram International Medical College Hospital □ 25
□ *M K Islam M A Hossain M Khanom M R Karim M J Uddin M A I Chowdhury*
- Status of Emergency Health Services at Major Hospitals in Chattogram □ 30
□ *K Sultana M J Uddin*
- Analysis of Chemical Composition of Urinary Stones: A Prospective Study □ 34
□ *M H Meah M M U Haque M M Rahaman A M Mozassem*
- Prevalence and Clinical Pattern of “Discharging Ear”- in the ENT Out Patient Department of a
□ Non-government Medical College Hospital □ 39 □
□ *M Afroz M Z Hussain M P I Sharif M S A Khan M A Rahman*
- Polypharmacy, Drug Adherence and Multimorbidity in Geriatric Patients □ 44
□ *B Barua M K Dutta I I Khan*
- Patterns of Smoking Behaviors among the Physicians, Chattogram, Bangladesh □ 50
□ *R S R Biswas F K Chowdhury T K Nath J D Nath S M H Mamun*



Chittagong Medical University Journal (CMUJ)

Editorial Board

Chief Advisor

Professor Dr. Md. Ismail Khan
Vice Chancellor
Chittagong Medical University

Chief Editor

Professor Dr. Pradip Kumar Dutta

Managing Editor

Professor Dr. M A Hassan Chowdhury

Members

Professor Dr. Md Abdus Sattar
Professor Dr. Aniruddha Ghose
Professor Dr. Md. Hafizul Islam
Professor Dr. Mohammed Monowar UI Haque
Dr. Hasina Nasreen
Dr. Md Mamunur Rashid
Dr. Bidduth Barua
Dr. Ireen Sultana
Dr. Mahid Bin Ameen
Dr. Saiful Amin
Dr. Rumana Rashid

Editorial Advisors

Principal, Chittagong Medical College
Principal, Cumilla Medical College
Principal, Abdul Malek Ukil Medical College
Principal, Cox's Bazar Medical College
Principal, Rangamati Medical College
Principal, Chandpur Medical College
Principal, Chattogram Maa-O-Shishu Hospital Medical College
Principal, BGC Turst Medical College
Principal, Chattogram International Medical College
Principal, Southern Medical College
Principal, Marine City Medical College
Principal, Eastern Medical College
Principal, Central Medical College
Principal, Mainamoti Medical College
Principal, Brahmanbaria Medical College
Principal, Institute of Applied Health Sciences
Principal, Chattogram International Dental College

Correspondence

Office of the Registrar

Chittagong Medical University
BITID Building, Faujdarhat
Chattogram, Bangladesh
Cell : +88 01785 92 22 47
Email : research@cmu.edu.bd

Published by

Office of the Publication & Research
Chittagong Medical University

Printed by

New Computer Suporna
Chattogram, Bangladesh.
Cell ☎ : ☎ +88 01819 80 30 50
Email ☎ : ☎ abedulhuq1960@gmail.com
☎ ☎ supornacomputer@yahoo.com

Chittagong Medical University Journal (CMUJ) is an official publication of Chittagong Medical University (CMU) Chattogram, Bangladesh.
Editorial Board is not responsible for the content (s) and comment (s) communicated through published articles.

Philosophical Aspects of Education

Md. Ismail Khan^{1*}

Broadly speaking all academic disciplines have their own philosophy or general guiding principles and theoretical frame works. Education as liberal arts subjects is no exceptions. It is the branch of applied or practical philosophy concerned with the nature and aims of education and the philosophical problems arising from educational theory and practice. Philosophy of education has a long and distinguished history in the Western philosophical tradition, from Socrates' battles with the sophists to the present day. Many of the most distinguished figures in that tradition incorporated educational concerns into their broader philosophical agendas.^{1,2}

Philosophy in its widest sense means love of knowledge. "*Philos*" means love and "*Sophia*" means knowledge. Philosophy aims at knowledge of truth. The concept of education is directly related to the concept of life itself. It leads in the various spheres of life. The objective of life was to secure freedom from the bondage of the material world. And bondage is the result of ignorance; liberation is the result of knowledge and liberation can be attained through a constant search for truth.³

Philosophy in a general sense is conceived a person's "sum of his fundamental beliefs and convictions". It is a guide for living; because the issues it addresses are basic and pervasive, determining the course we take in life. Hence we can say that all the aspects of human life are influenced and governed by the philosophical consideration. The education of a people is determined by its philosophy or scheme of life. Many noted thinkers have emphasized the importance of philosophy in human life. Man wants to know himself and also tries to lead his life in the light of his

knowledge of himself and of the world. Desire for knowledge springs from the rational nature of man. It is an attempt to satisfy this rational nature and eternal desire of man. It is not, therefore, a luxury but a necessity. Aldous Huxley (1894-1963) an eminent English writer, observes in his book "Ends and Means" that "men live in accordance with their philosophy of life, their conception of the world. It is impossible to live without a metaphysic. According to Schopenhauer "Every man is a born metaphysician".⁴

Entomologically, the term "Education" has been derived from Latin word – "*Educare*", "*Educere*" and "*Educatum*". "*Educare*" means "to rise up or bring up or nourish". It indicates that the child is to be brought up or nourished keeping certain aims and ideals. The term "*Educere*" denotes "to lead out or to draw out". In this regard, education through its process draws out of the best what is inside the child." "*Educatum*" indicate the act of teaching or training. It throws light on the principles and practice of teaching. The term *Educare* or *Educere* mainly indicates development of the latent faculties of the child. In Indian language education means "*Siksha*" which has been derived from Sanskrit verbal root "*Shash*", which means to discipline, to control, to order, to direct, to rule etc. Education in this sense means controlling or disciplining the behavior of an individual. There is another term in Sanskrit, which throws light on the nature of education. It is "*Vidya*" which means knowledge. The term "*Vidya*" has originated from "*Bid*" meaning knowledge / to know/ acquire knowledge. Hence education in broader sense is any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense, education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another. Webster defines education as the process of educating or teaching. Educate is further defined as "to develop the knowledge, skill, or character. Thus, from these definitions, we might assume that the purpose of education is to develop the knowledge, skill or character of students."⁵

1. □ Vice Chancellor
□ Chittagong Medical University, Chattogram, Bangladesh.

*Correspondence to: □ [Professor \(Dr\) Md. Ismail Khan](#)
□ Cell: +88 01720 96 43 06
□ Email: ismailbangladesh@yahoo.com

Submitted on □ 27th February 2022
Accepted on □ 5th March 2022

Hence, the term education has a wide connotation. It is difficult to define education by single definition. Philosophers and thinkers from Socrates to Dewey in west and a host of Indian philosophers have attempted to define education. However education can be understood as the deliberate and systematic influence exerted by a mature through instruction and discipline. It means the harmonious development of all the powers of the human being, physical, social, intellectual, aesthetic and spiritual. The essential elements in the educative process are a creative mind, a well integrated self, socially useful purposes and experience related to the interests of the individual, needs and abilities of the individual as a of a social group. Broadly we can say, Education is a social process that intends to modify the behavior of the pupil in a social desirable direction through learning.

Socrates said, “Knowledge is virtue”. His followers pointed out that mere knowledge of what is right is not actually competent to lead right actions because our actions are guided as much by reason as by blind impulses. Unless these impulses are controlled, action cannot fully follow the dictates of reason.

So mere knowledge in the theoretical sense of what is right does not lead to our goal. To carry into practice what we consider to be right constitutes virtue. Such practice is only possible when we can control our desires and impulses and can rationalise them.

The philosophies of education are significant and wide-ranging, touching many other branches of philosophy, such as metaphysics, epistemology and axiology. Despite its long and diverse history, it only emerged as a systematic branch of philosophy in the latter half of the 20th century. Metaphysics in education explores the nature of reality. It provides a base for educational thought by establishing knowledge, truths and values. The history of the philosophy of education started in ancient philosophy and has remained an important topic to the present day. Thousands of years ago Aristotle presented a classification of knowledge, which divided the whole complex of human knowledge into three forms: *episteme* (Scientific knowledge) *techne* (Skill and crafts) and *phronesis* (Often translated as practical wisdom). Aristotelianism is a philosophical tradition inspired by the work of Aristotle, usually characterized by deductive logic and an analytic inductive method in the study of natural philosophy and metaphysics. The Aristotle model of communication is the widely

accepted and the most common model of communication where the sender sends the information or a message to the receivers to influence them and make them respond and act accordingly. Aristotle's most famous achievement as logician is his theory of inference, traditionally called the syllogistic. According to a conventional view, Plato's philosophy is abstract and utopian, whereas Aristotle's is empirical, practical and commonsensical.

There are four major educational philosophies, each related to one or more of the general or world philosophies. They are: **Perennialism**, **Essentialism**, **Progressivism** and **Social Reconstructionism**. A mix of more than two philosophies is called Eclecticism. These educational philosophies focus heavily on what we should teach and also the curriculum aspect.⁶

Perennialism

Perennialism focuses on to teach ideas of truth and logic that are everlasting (‘Perennial or eternal’). Perennialism values knowledge that transcends time. Perennialists are primarily concerned with the importance of mastery of the content and development of reasoning skills. The adage “the more things change, the more they stay the same” summarizes the perennialists’ perspective on education. That means despite apparent changes or advancements, certain fundamental aspects or patterns remain unchanged over time. Learning is to seek enduring truths which are constant, not changing. It includes essential cognitive courses like mathematics, science, history, language etc. Cultivation of the intellect is the highest priority in a worthwhile education. Perennialism is subject-centered and teacher-centered philosophy where the teachers are the main actors on the stage. Here, the teaching is by Socratic method: i) Oral exposition (Commentary and explanation) ii) Lecture and explication (Analysis and meaning). The goal of a perennialist educator is to teach students to think rationally and develop mind that can think critically. Learning happens following Jean Piaget’s cognitive theory (1930) which states that children learn through direct and active interaction with the environment. In this philosophy, skills are developed in a sequential manner. The loftiest accomplishments of humankind are emphasized.

Essentialism

Essentialism includes philosophies of Realism (Feeling) and Idealism (Believing). Essentialists believe that there is a common core of knowledge that

needs to be transmitted to students in a systematic, disciplined way. It gives emphasis on teaching the essentials and the core of the curriculum is essential knowledge and skills and academic rigor. Although this educational philosophy is similar in some ways to Perennialism, Essentialists accept the idea that this core curriculum may change. Essentialism is the educational philosophy of teaching basic skills. Teaching should be practical, preparing students to become valuable members of society. It should focus on facts - the objective reality out there--and "the basics," training students to read, write, speak, and compute clearly and logically. Schools should not try to set or influence policies. Teaching should be practical and real but not artificial and theoretical (Rabindranath Tagore). Students should be taught hard work, respect for authority, and discipline. This philosophy advocates training the mind. Essentialism is also a subject-centered philosophy and the teachers impart knowledge mainly through conducting lectures. The goal of curriculum is to develop citizens by instilling core knowledge and a hard work ethic and mental discipline. Assessments are done to show sufficient competence to prove a valuable member of civilized society. Rather than "teaching as banking," in which the educator deposits information into students' heads. William C. Bagley (1874-1946) was one of the most influential advocates of essentialism. Paulo Freire (1927-1997) saw teaching and learning as a process of inquiry that would enable people to create in change in their lives by inventing and reinventing the world.

Progressivism

Progressivists believe that individuality, progress, and change are fundamental to one's education. Believing that people learn best from what they consider most relevant to their lives, progressivists center their curricula on the needs, experiences, interests, and abilities of students. Progressivism was developed by John Dewey's (1859-1952) pragmatism theory that emphasizes the teaching and learning should focus on keeping things practical and need to learn by doing. Education is "Preparing a person to face everyday life" (Dewey). The learner is a problem solver and thinker who makes meaning through his or her individual experience in the physical and cultural context. Effective teachers provide experiences so that students can learn by doing. Curriculum content is derived from student interests and questions.

Social Reconstructionism

Social reconstructionism is a philosophy that emphasizes the addressing of social questions and a quest to create a better society and worldwide democracy. Reconstructionist educators focus on a curriculum that highlights social reform as the aim of education. Theodore Brameld (1904-1987) was the founder of social reconstructionism, in reaction against the realities of World War II. George Counts (1889-1974) recognized that education was the means of preparing people for creating this new social order. For social reconstructionists and critical theorists, curriculum focuses on student experience and taking social action on real problems, such as violence, hunger, international terrorism, inflation and inequality. Strategies for dealing with controversial issues (Particularly in social studies and literature), inquiry, dialogue, and multiple perspectives are the focus. Community-based learning and bringing the world into the classroom are also strategies. The root word of Constructivism is "construct." Basically, Constructivism is the theory that knowledge must be constructed by a person, not just transmitted to the person. People construct knowledge by taking new information and integrating it with their own pre-existing knowledge.⁷ It means they are actively involved in seeking out information, creating projects, and working with material being presented versus just sitting and listening to someone "talk at them".

Briefly, Perennialism focuses on human concerns that have caused concern for centuries, revealed through 'great works'.⁸ It focuses on great works of art, literature and enduring ideas. Essentialism emphasizes skills and subjects that are needed by all in a productive society. This is the belief in "Back to Basics". Progressivism provides instruction features problem-solving and group activities and the instructor acts as a facilitator as opposed to a leader and Social Reconstructionism emphasizes instruction focuses on significant social and economic problems in an effort to solve them.⁸

It is concluded, therefore, that the philosophy of education is an extremely important discipline nowadays and its application is undoubtedly effective as a tool to deal with human issues, as well as its effects and causes.

The issues related to education cannot be articulated without the presence of philosophy. Since the beginnings of the formation of the social unit, both

have been discussed and experienced as coherent subjects and included in the teaching perspective, with several ideas guided by the first philosophers and perpetuated in order to develop the student's critical sense and make him able to exercise the argumentative sense and develop self-knowledge and reflection. It is necessary to understand philosophers and their propositions, so that a new understanding of reality is approached. This understanding of the real is paramount for the environment, because in society there is an assiduous search for those capable of making a difference. Thus, we can conceptualize the

philosophy of education as being a set of ideas that defines what education is like and how important it is not only in the school context, but also for social life, making us capable of developing knowledge, skills and attitudes towards the facts that surround us and remain rooted in society. Therefore, philosophy seeks to form more critical citizens who know how to analyze the facts with the capacity to understand reality and who play their roles as agents of society, proposing solutions to the challenges found in a globalized and information-saturated world.

REFERENCES

1. □ Curren, Randall R. *Aristotle on the Necessity of Public Education*, Lanham, MD: Rowman & Littlefield. 2000.
2. □ Curren, Randall R. "Education, History of Philosophy of", revised second version, in *Routledge Encyclopedia of Philosophy Online*. 2018. doi:10.4324/9780415249126-N014-2.
3. □ Brubacher J.S. *Modern Philosophies of Education*. McGraw-Hill Book Company, New York. 1961.
4. □ *Philosophy of Education*. *Stanford Encyclopedia of Philosophy*. 2018.
5. □ Aggarwal JC, *Essentials of Educational Psychology*, Vikas Publishing House Pvt Ltd. 2014.
6. □ Natha A. *Educational Psychology*, Publisher. Allyn & Bacon. 2006.
7. □ Woolfolk, A. *Educational psychology*. 10th Edition. 2007.
8. □ Ornstein AC, *Foundations of Education*. Wadsworth Publishing. 2003.

Consequences of Polypharmacy in the Elderly

Sujat Paul^{1*}

Do Polypharmacy are Associated with the Outcome of Dementia and Depression among the Geriatric Patients?

The number of geriatric population (≥ 65 years) has been increasing over last decade. Polypharmacy is very common in geriatric patients because of their multiple co-morbidities. This commentary will be focused on finding out prevalence of polypharmacy (Pattern- prescriptions and non-prescriptions, commonly prescribed medications) common co-morbidities, adherence to medications, irrational use of drugs, inappropriate dosing among geriatric patients in contrast with their dementia and depression status at the time of hospital admission.

As physiological changes associated with ageing affect a person's handling and response to drugs, using multiple medications may cause problems such as the increased risk of inappropriate use of medications (Including drug-drug interactions and duplications of therapy), higher healthcare costs, adverse drug events, medication non-adherence, decreased functional status and geriatric syndromes. Unfortunately, large clinical trials often exclude geriatric people and those with co-morbidities.

Until recently, only limited data have been available regarding polypharmacy associated health problems among geriatric patients in Bangladesh. Knowledge of the nature and extent of polypharmacy in general practice, to establish the degree of polypharmacy that leads to health problems in geriatric patients should have to be gathered so that we can identify and raise awareness of major adverse health outcome associated with polypharmacy in geriatric patients.

Polypharmacy (ie, the use of multiple medications usually ≥ 5 and/or the administration of more medications that are clinically indicated, representing unnecessary drug use) is common among the geriatric populations for many years.¹ The incidence of chronic disease is both linked to polypharmacy, which is defined by the World Health Organization as the administration of multiple drugs concurrently or an excessive number of drugs.² Study revealed that the increasing number of drugs and age were both associated with the incidence of dementia.³ A previous study reported a case of dementia that was reversed following the withdrawal of some prescribed drugs, and the authors emphasized the grave implications of polypharmacy on multiple comorbidities in dementia patients.^{4,5} Moreover, constant exposure to polypharmacy can result in cognitive impairment, that may, in long-term, develop into dementia.⁶ Up to 30 percent of hospital admissions in the elderly may be associated with drug related problems.⁷ Another study by Kersten et al showed the concomitant use of ≥ 3 psychotropic/opioid drugs in geriatric patients was associated with reduced hand-grip strength.⁸ Nearly 50% of older adults take one or more medications that are not medically necessary.

Polypharmacy in geriatric patients continues to increase and is a known risk factor for important morbidity and mortality. In the population of over 65-year olds, 16.4% receiving 10 or more medications.⁹ A study of 236 ambulatory patients aged ≥ 65 years by Lipton et al found that almost 60% of patients were taking medications that were suboptimal or lacking an indication.¹⁰ Concurrent use of multiple medications can increase the risk of adverse drug reactions. The risk of Adverse Drug Reactions (ADRs) is 15% with two medications, and increases to 58% with five medications and 82% with over seven medications.¹¹ There is also a positive correlation between number of days staying in hospital with an increase in number of drugs. Increased one day stay by an elderly lead to an increase in number of drugs by 0.296 in admitted elderly and 0.095 at discharge.¹ In a prospective cohort study of older hospitalized adults taking 5 or more

1. Professor of Medicine & Principal
 Marine City Medical College, Chattogram, Bangladesh.

*Correspondence to: [Professor \(Dr\) Sujat Paul](#)
 Cell: +88 01711 76 25 82
 Email: dr.sujatpaul@gmail.com

Submitted on 8th February 2022
Accepted on 20th February 2022

medications, the prevalence of a potential hepatic cytochrome enzyme-mediated, drug-drug interaction was 80%. The probability of a drug-drug interaction increased with the number of medications. In the elderly, non-compliance is stated as being as high as 50% and the likelihood rises with the number of medications prescribed. Hanlon et al found that both the number of prescription (Odds Ratio [OR] 1.28, 95% CI, 1.21-1.36) and non-prescription (OR, 1.17, 95% CI, 1.12-2.35) medications increase the risk of inappropriate prescribing.⁷

In one of our studies the average age of individuals was 65.56±6.9 years and 62 were men. The prevalence of polypharmacy, dementia and drug non-adherence was respectively, 56%, 47% and 49%. Patients with polypharmacy were more likely to be non-adherent (Odds ratio: 2.4, 95% CI: 1.1-5.4, p=0.039) and demented (Odds ratio: 3.38, 95% CI: 1.1-11.8, p=0.019) than the elderly patients without polypharmacy.¹²

Table I Association between dementia and polypharmacy

Polypharmacy □	Dementia present □	Dementia absent □	p value
No □	15 (31.9) □	29 (54.7) □	0.022*
Yes □	32 (68.1) □	24 (45.3) □	

*Chi-square test.

Table II Association between polypharmacy with dementia and drug compliance

Polypharmacy □ with dementia □	Drug compliance □ good (n=51) □	Drug compliance □ bad (49)	p value
Yes □	12 (23.5) □	20 (40.8) □	0.064*
No □	39 (76.5) □	29 (59.2) □	

*Chi-square test.

Polypharmacy was the independent predictor for drug non-adherence.¹² Pasina and colleagues, 2014, reported that polypharmacy is very common among older adults and is significantly contributes to poor adherence to therapies.¹³ Khatun UF et al reported that the frequency of polypharmacy was high among elderly people admitted in medicine wards of a tertiary level hospital of Bangladesh.¹² According to her study, prevalence of polypharmacy, dementia and drug non-adherence was respectively, 56%, 47% and 49% in southern part of Bangladeshi population. Patients with polypharmacy were more likely to be non-adherent (Odds ratio: 2.4, 95% CI: 1.1-5.4, p=0.039) and demented (Odds ratio: 3.38, 95% CI: 1.1-11.8, p=0.019) than the elderly patients without polypharmacy. In a study conducted in Taiwan, the risk of dementia increases steadily with the increased number of medications used and age in older people. Cerebrovascular disease, diabetes mellitus, chronic kidney disease and hypertension also correlated with the risk of dementia in that study.³ Another study conducted in South Korea also identified a significant association between polypharmacy and the incidence of dementia among elderly.⁶

Results of the literature review revealed that polypharmacy continues to be a significant issue regarding nonadherence and dementia in the elderly. More research has to be conducted in this issue. There is a gap in the literature regarding the interventions implemented by primary care providers to address polypharmacy. Judicious use of drugs is mandatory to reduce this risk of dementia. Health care professionals (Doctor, Pharmacist, Nurse) should be aware of the risks and fully evaluate all medications at each geriatric patient visit to prevent polypharmacy from occurring.

REFERENCES

1. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in Elderly Patients. *The American Journal of Geriatric Pharmacotherapy*. 2007;5(4):345-351.
2. Definition of an older or elderly person, Health statistics and information systems. WHO. <http://www.who.int/healthinfo/survey/ageingdefnolder/en/>.
World Population Ageing 2013 - the United Nations. https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.
3. Lai SW, Lin CH, Liao KF, Su LT, Sung FC, Lin CC. Association between polypharmacy and dementia in older people: A population-based case-control study in Taiwan, *Geriatrics & gerontology international*. 2012;12(3):491–498.
4. Evans MD, Shinar R, Yaari R. Reversible dementia and gait disturbance after prolonged use of valproic acid, *Seizure* 2011; 20(6):509–511.
doi: 10.1016/j.seizure.2011.02.009 PMID: 21435910.
5. Gupta M, Singh R, Singh K, Lehl SS. Reversible dementia and gait disturbance as a result of polypharmacy. *BMJ case reports*. 2013, Epub 2013/03/28.
6. Park J-W, Song HJ, Sohn HS, Kwon J-W. The Association between Polypharmacy and Dementia: A Nested Case-Control Study Based on a 12-Year Longitudinal Cohort Database in South Korea, *PLoS ONE*. 2017;12(1):1-17.
7. Hanlon et al. Adverse Events After Discontinuing Medications in Elderly Outpatients, *Arch Intern Med*. 1997;157(19):2205-2210. doi:10.1001/archinte.1997.00440400055007.
8. Kersten H, Hvidsten LT, Gløersen G, Wyller TB, Wang-Hansen MS. Clinical impact of potentially inappropriate medications during hospitalization of acutely ill older patients with multimorbidity, *SCANDINAVIAN JOURNAL OF PRIMARY HEALTH CARE*. 2015;33(4):243–251.
9. Marengoni A, Onder, G. Guidelines, polypharmacy, and drug-drug interactions in patients with multimorbidity. *BMJ*. 2015. 350:h1059. doi:10.1136/bmj.h1059 PMID: 25761379.
10. Lipton HL, Bero LA, Bird JA, McPhee SJ. The impact of clinical pharmacists's consultations on physicians' geriatric drug prescribing. A randomized controlled trial, *Med Care*. 1992;30: 646-658.
11. Masodi N. Polypharmacy: To err is human, to correct divine, *British Journal of Medical Practitioners*. 2008;1(1):6–9. www.bjmp.org/files/sept2008/bjmp0908namasoodi.pdf.
12. Khatun U F et al. Assessment of Frequency of Polypharmacy along with its Relation to Dementia and Drug Adherence among Admitted Geriatric Patients in Medicine Wards of a Tertiary Care Hospital. *Journal of Medicine*. 2023;24(1):3-9. DOI:10.3329/jom.v24i1.64897.
13. Pasina L, Brucato AL, Falcone C, Cucchi E, Bresciani A, Sottocorno M et al. Medication non-adherence among elderly patients newly discharged and receiving polypharmacy. *Drugs & aging*. 2014;31(4):283-289.

Dengue Fever : A Review

Joyabrata Das^{1*}

ABSTRACT

Background: Dengue is an acute viral illness caused by RNA virus of the family Flaviviridae and spread by Aedes mosquitoes. Presenting features may range from asymptomatic fever to dreaded complications such as hemorrhagic fever and shock. Acute-onset high fever, muscle and joint pain, myalgia, cutaneous rash, hemorrhagic episodes, and circulatory shock are the commonly seen symptoms. Early and accurate diagnosis is critical to reduce mortality. Although dengue virus infections are usually self-limiting, dengue infection has come up as a public health challenge in the tropical and sub tropical nations. This review aims to summarize the overall scenario of dengue including disease burden, diagnosis, differential diagnosis, investigation, management and prevention.

Methodology: This current study is a narrative review of published studies and articles by searching PubMed Scopus and Google Scholar. Structured search strategy using appropriate keywords and title.

Conclusion: It has depicted the overall dengue situation of Bangladesh and identified gaps in dengue management and provided future perspective to prevent impending outbreaks across.

Key words: Cutaneous rash; Dengue virus; Hemorrhagic episodes; Public health.

INTRODUCTION

The WHO classifies DF into two groups: Uncomplicated and severe. Severe cases are linked to excessive hemorrhage, organ impairment or severe plasma escape, and the remaining cases are considered uncomplicated.

According to the 1997 classification, dengue can be divided into undifferentiated fever, DF and DHF.

DHF was further subdivided into grades I–IV.

Grade I: Only mild bruising or a positive tourniquet test

Grade II: Spontaneous bleeding into the skin and elsewhere

Grade III: Clinical sign of shock

Grade IV: Severe shock - feeble pulse and blood pressure cannot be recorded.

Grades III and IV comprise DSS.

New Revised WHO Dengue Case Classification by Severity

a) Dengue without warning signs: Group-A (Send home).

- Probable Dengue: Live in/travel to dengue endemic area. Fever and 2 of the following criteria: Nausea, vomiting, Rash, Aches and pains, Tourniquet test positive, Leucopenia on Warning sign.

Laboratory Confirmed dengue: (Important when no sign of plasma leakage).

b) Dengue with warning signs: Group-B (Referred for in-hospital care). Severe abdominal pain or tenderness, Persistent vomiting >3 times/day, Persistent diarrhoea >3 times/day, Clinical fluid accumulation, Mucosal bleed, Lethargy, restlessness, Liver enlargement >2cm, Laboratory : Increase in Hematocrit (Hct). concurrent with rapid decrease in platelet count, Requiring strict observation and medical intervention.

c) Severe dengue: Group-C (Require emergency management).

i) Severe Plasma Leakage leading to : Shock (DSS), Fluid accumulation with respiratory distress.

ii) Severe Bleeding as evaluated by clinician.

iii) Severe Organ Involvement Liver: AST or ALT ≥ 1000, CNS: Impaired consciousness, Heart failure, oedema.

iv) Metabolic and electrolytes abnormalities.

Recently, Dengue fever in Bangladesh is appearing with some atypical clinical and biochemical features such as absence of antigen, more presenting e leukopenia more than thrombocytopenia, more liver dysfunction (Like rise of aminotranferases hypoalbuminemia) than change in Hct.

The aim of this review is to explore the typical clinical features of dengue with respect to Bangladesh perspective.

1. Professor of Medicine & Principal
 Southern Medical College
 Chattogram, Bangladesh.

*Correspondence to: Professor (Dr) Joyabrata Das

Cell: +88 01819 31 83 34

Email: drdasjb@gmail.com

Submitted on 12th February 2022

Accepted on 22th February 2022

SEARCH STRATEGY

Available studies and abstract were identified through PubMed (1980-2022), Scopus and Google. Key search topics were "Dengue Fever : A Review and relevant articles from references lists of reviewed articles were also searched. The search terms were the following keywords used in combination: "Breakbone fever; Cutaneous rash; Dengue virus; Hemorrhagic diathesis; Public health."

DISCUSSION

Undifferentiated fever is seen mostly in the primary infection but may also occur following the initial secondary infection. Clinically, it is difficult to differentiate from numerous other viral diseases and often remains undiagnosed. DF follows both primary and secondary infections and is most frequently encountered in adults and older children. Onset of symptoms is characterized by a biphasic, high-grade fever lasting for 3 days to 1 week. Severe headache (Mainly retrobulbar), lassitude, myalgia and painful joint, metallic taste, appetite loss, diarrhea, vomiting and stomachache are the other reported manifestations. Dengue is also known as breakbone fever because of the associated myalgia and pain in joints. Of patients with DF, 50–82% report with a peculiar cutaneous rash. The initial rash is the result of capillary dilatation, and presents as a transient facial flushing erythema, typically occurring before or during the first 1–2 days of fever. The second rash is seen at 3 days to 1 week following the fever, and presents as an asymptomatic maculopapular or morbilliform eruption. Sometimes, individual lesions may merge and present as widespread confluent erythematous areas with pinpoint bleeding spots and rounded islands of sparing, giving a typical appearance of "white islands in a sea of red." The cutaneous rash is usually asymptomatic, and pruritis is reported only in 16-27% cases. Bleeding episodes are infrequently seen in DF, although epistaxis and gingival bleeding, substantial menstruation, petechiae/purpura and Gastrointestinal Tract (GIT) hemorrhage can occur.¹⁻⁴

Dengue Hemorrhagic Fever (DHF) is frequently seen during a secondary dengue infection. However, in infants it may occur during a primary infection due to maternally attained dengue antibodies. The proposed diagnostic criteria for DHF includes clinical parameters acute-onset febrile phase – high-grade fever lasting from 2 days to 1 week. Hemorrhagic episodes (At least one of the following forms):

Petechiae, purpura, ecchymosis, epistaxis, gingival and mucosal bleeding, GIT or injection site, hematemesis and/or malena Positive tourniquet and hepatomegaly. Laboratory parameters are Thrombocytopenia (Platelet count <100,000/cu mm).

The hemorrhagic episodes in DHF are associated with multifactorial pathogenesis. Vasculopathy, deficiency and dysfunction of platelets and defects in the blood coagulation pathways are the attributed factors. Decreased production of platelets and increased destruction of platelets may result in thrombocytopenia in DHF. The impaired platelet function causes the blood vessels to become fragile and this results in hemorrhage.⁵⁻⁶

The clinical course of DHF is characterized by three phases are Febrile, Leakage and Convalescent phase. High-grade fever of acute onset along with constitutional signs and facial erythema characterizes the commencement of the febrile illness. The initial febrile illness is marked by a morbilliform rash and hemorrhagic tendencies. The fever persists for 2 days to 1 week and then drops to normal or subnormal levels when the patient either convalesces or advances to the plasma leakage phase. High plasma escape cases are marked by frank shock with low pulse pressure, cyanosis, hepatomegaly, pleural and pericardial effusions, and ascites. Severe ecchymosis and gastrointestinal bleeding followed by epistaxis may also be noted in a few cases. Bradycardia, confluent petechial rashes, erythema, and pallor are seen during this phase. Dengue Shock Syndrome (DSS) is defined as DHF accompanied by an unstable pulse, narrow pulse pressure (<20 mmHg) restlessness, cold, clammy skin and circumoral cyanosis. Progressively worsening shock, multiorgan damage, and disseminated intravascular coagulation account for a high mortality rate associated with DSS. The shock persists for a short span of time and the patient promptly recovers with supportive therapy.^{7,8}

Clinical Signs of Dengue Shock Syndrome: Cool extremities, delayed capillary refill time, lethargy or restlessness (which may be a sign of reduced brain perfusion), tachypnoea or kussmaul's breathing tachycardia, weak pulse, narrow pulse pressure (pulse pressure \leq 20 mmHg with increased diastolic pressure, e.g. 100/80 mmHg) hypotension (Defined as systolic pressure <80 mmHg for those aged <5 years or 80 to 90 mmHg for older children and adults).

Expanded Dengue Syndrome: Unusual manifestations with severe organ involvement such as liver, kidneys, brain or heart associated with Dengue infection reported in DHF and also in DF who do not have evidence of plasma leakage. These unusual manifestations may be associated with co-infections, co-morbidities or complications of prolonged shock.^{9,10}

Other Features: Oral features are infrequently seen in dengue virus infection and are more commonly associated with DHF. Erythema, crusting of lips and tongue and soft palatal vesicles constitute the prominent oral features in dengue virus infection. A study reported higher cases involving the mucosa with scleral injection (90%), whereas Sanford noticed vesicular eruptions of the soft palate (>50%). A study reported numerous hemorrhagic bullae on the sublingual mucous membrane, lateral surface of the tongue, and floor of the mouth. Brown-colored plaque like lesions with a rough surface were seen on the buccal mucosa that showed bleeding on touch along with spontaneous bleeding from the gingiva and the tongue. Petechiae, purpura, ecchymoses and nasal bleeding have also been reported. Another study reported bleeding gums, hemorrhagic plaques and inflamed tonsils in a dengue-infected patient.¹¹⁻¹⁴

Lab Diagnosis

CBC

NS1 antigen (Within 5 days)

ICT for Dengue IgG & IgM (After 5 days)

ALT & AST

Serum Electrolytes

Chest X-ray

Ultrasonography of Abdomen.

A decreased number of white blood cells (Leukopenia), accompanied by a decreased number of platelet count (Thrombocytopenia) and raised PCV, initial changes on laboratory examinations. Microbiological laboratory testing confirms the diagnosis of DF. Virus segregation in cell cultures, nucleic acid demonstration by Polymerase Chain Reaction (PCR) and serological detection of viral antigens (Such as NS1) or particular antibodies are the preferred microbiological assays.¹⁵ Viral segregation and nucleic acid demonstration provide precise diagnosis, although the high cost limits the availability of these tests. Chest X-ray and Ultrasonography of Abdomen to see the plasma leakage.^{16,17}

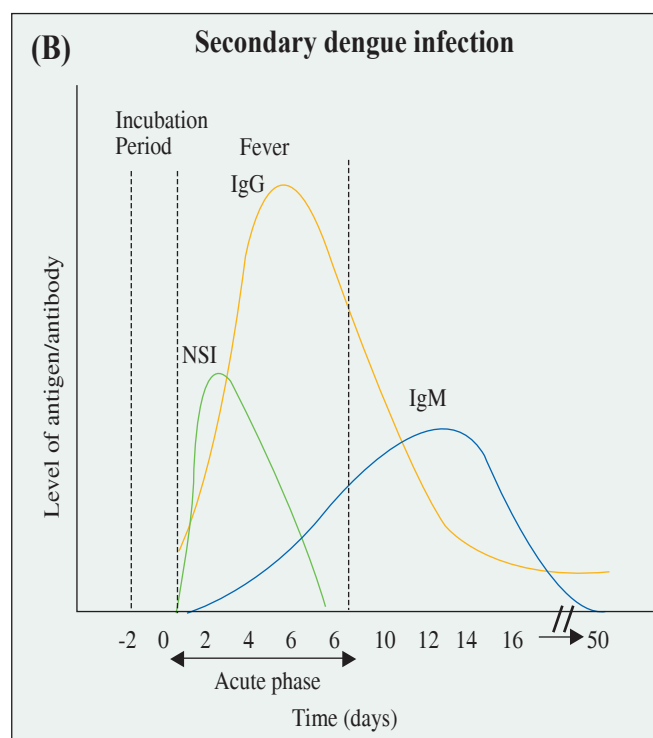
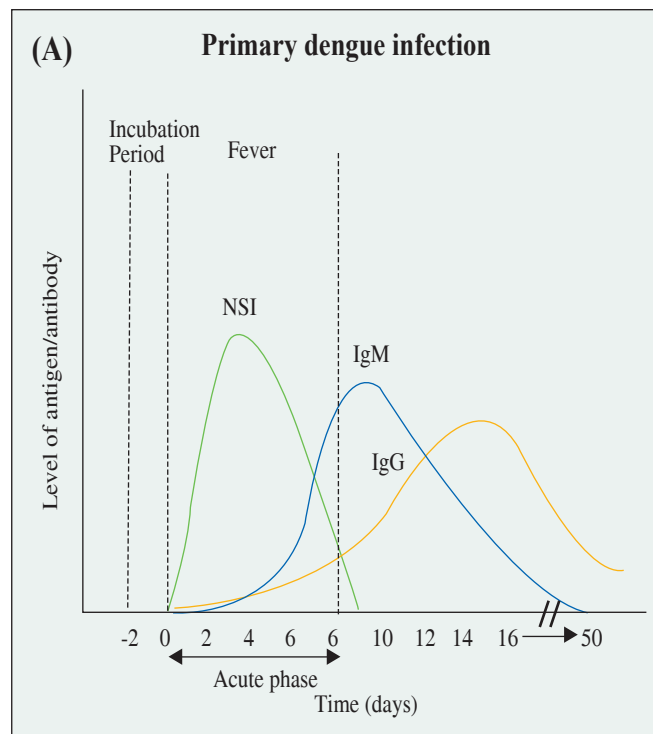
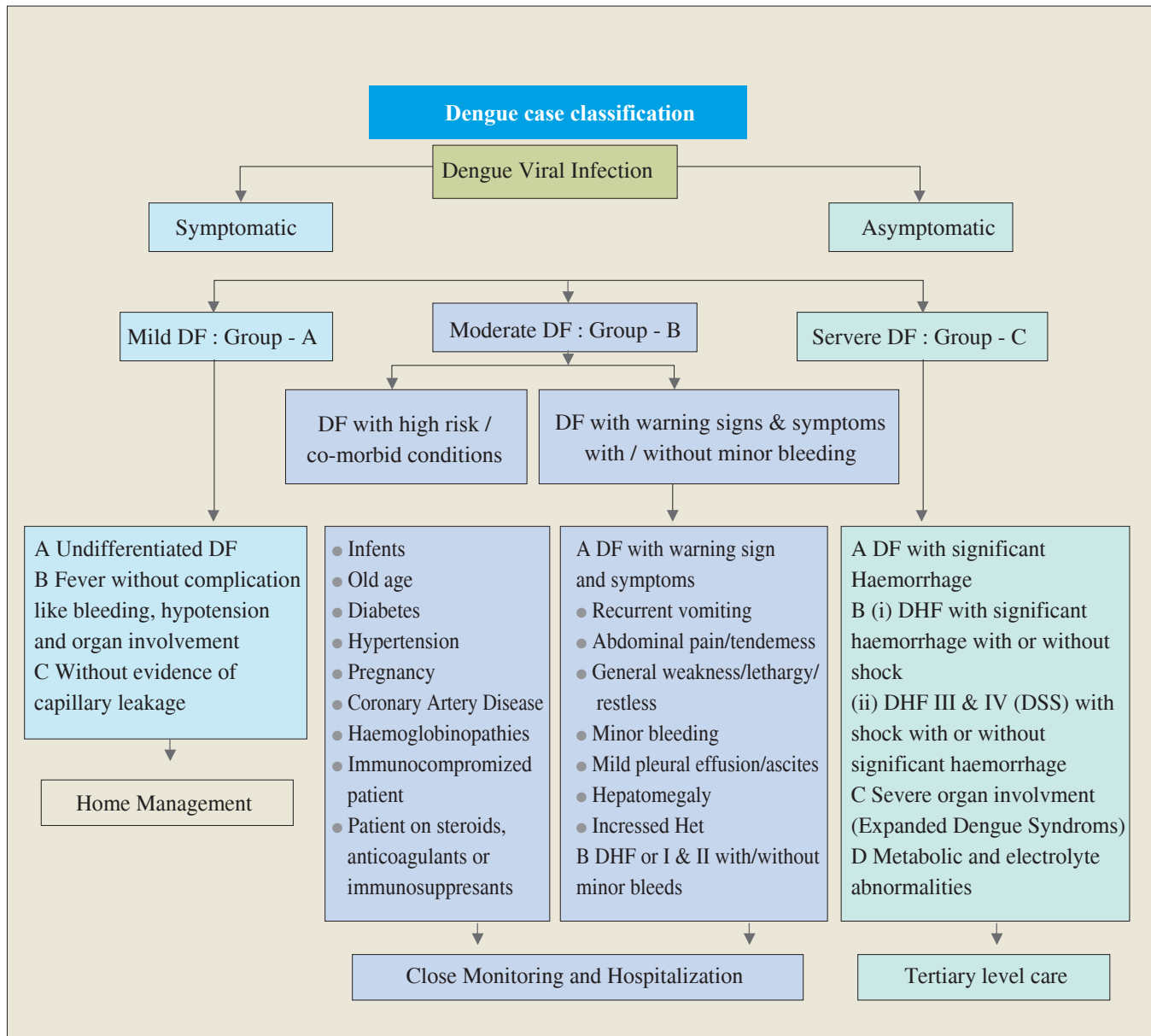


Figure 1 The level of NS1, IgM and IgG for primary and secondary dengue infection. (A) During primary infection, NS1 and IgM are detectable starting day 0 onwards and day 3 onwards, respectively, while IgG can only be detected on day 10 onwards. (B) For secondary infection, IgG level is used to differentiate both primary and secondary infection by presenting very significant level during acute phase due to rapid anamnestic IgG reaction

Management of Dengue Infection: Its shown in the following Algorithm



Fluid replacement and antipyretic therapy with paracetamol is the preferred therapy following the febrile phase. Care should be taken not to use other nonsteroidal antiinflammatory drugs. Judicious fluid administration forms the mainstay of treatment during the critical phase of the infection. Normal saline, Ringer's Lactate, and 5% glucose diluted 1:2 or 1:1 in normal saline, plasma, plasma substitutes, or 5% albumin are the routinely administered fluids. WHO guidelines summarize the following principles of fluid therapy: Oral fluid supplementation must be as plentiful as possible. However, intravenous fluid administration is mandatory in cases of shock, severe

vomiting, and prostration (Cases where the patient is unable to take fluids orally) Crystalloids form the first-line choice of intravenous fluid (0.9% saline) Hypotensive states that are unresponsive to boluses of intravenous crystalloids, colloids (e.g., dextran) form the second-line measures. If the patient remains in the critical phase with low platelet counts, there should be a serious concern for bleeding. Suspected cases of bleeding are best managed by transfusion of fresh whole blood. In dengue fever, we have to avoid NSAID's and intramuscular injections.^{18,19}

Ongoing Research on Dengue Treatment and Vaccination:-^{20,18,21,22,13,17,14,23-26,16,27-29}

Therapeutic agents	DENV serotypes	Target	Highlights
Peptide inhibitor	All	DENV NS1	Unique binding sites of NS1 targeted by peptides.
Synthetic peptide	DENV2	NS1	Generation of synthetic peptide with unique epitope which is immunogenic towards anti-peptide antibody in rabbits as a potential serotypic specific detection tools.
Peptide inhibitor	DENV1-4	DENV E proteins	MLH40 peptide (24–31 μM) manage to inhibit all serotypes and 80% inhibition effect against DENV2 was achieved at 100 μM.
Peptide inhibitor	All	stem domain of DENV E proteins	DN59 possesses great inhibitory activity to all DENV serotypes at low concentration. It also able to disrupt viral membrane and release viral genome.
Neutralizing antibody	DENV-1	CC' loop of DIII	Neutralizing activity of antibody which targets on cryptic epitopes can be affected by genotypic variation of DENV.
Broadly neutralizing antibody	All	EDE	Monoclonal antibodies which bind to the EDE shows broadly neutralizing effect for all DENV serotypes.
Neutralizing human monoclonal antibody	All	N/A	Utilization of gene modification in DNA plasmids to express 1G7C2_hG1-LALA antibodies which can provide cross neutralization effect to all DENV serotypes without ADE activity.
Bispecific antibody	All	EDII, EDIII domain	This bispecific antibody maintains the binding abilities from its parental antibodies and possess better neutralizing effect against DENV.
Vaccine candidate	DENV	Modified NS1 wing domain	Generation of mAb 33D2 which possess both in-vitro and in-vivo inhibition.
Vaccine candidate	DENV	Modified NS1	Do not cross react with platelets or uninfected endothelial cells and the prolonged bleeding time induced by DENV is reduced significantly using dengue haemorrhagic mouse model
Vaccine candidate	DENV2	E protein and NS1	Combination of E protein-based and NS1-derived DNA vaccines provide potent immunity protection in immunized mice model.
Antiviral agent	All	C protein	A small molecule ST-148 had been discovered to have inhibition reaction on the replication of four serotypes of DENV
Antiviral agent	DENV2	C protein	Virions assembled with inhibitor-bound capsid tetramers cannot uncoats the nucleocapsid well and resulting in DENV replication inhibition.
Virus inhibitor	Different serotypes and genotypes	NS3-NS4B complex	JNJ-A07 shows promising inhibitory activities against different 21 combinations of genotypes and serotypes by blocking the NS3 and NS4B interaction.
Anti-dengue therapeutic	-	NS2B-NS3 protease	Latarcin peptide (Ltc 1) significantly inhibits the spreading and replication of virus by interacting with NS2B-NS3 protease
Neutralizing antibody	DENV2	EDIII	mAb DB32–6 is the clone with strongest neutralizing activity, it was further converted to humanized antibody which preserved its original neutralizing effect against different strains of DENV2.

Prevention

Control of mosquito (Vector) transmission, development of dengue vaccine, and antiviral drugs constitute future directions with an aim to prevent and treat dengue infection. Control of mosquito (Vector) transmission can be done by keeping guppies (*Poecilia reticulata*) or copepods (*Doridicola agilis*) in standing water, and infecting the mosquito population with bacteria of the *Wolbachia* genus. Due to the progressing transmission and enhancing severity of dengue infection, the necessity to develop a dengue

vaccine has gained considerable importance. There is a worldwide public health need for a safe, effective and economic tetravalent dengue vaccine. Complex pathology, the prerequisite to control four virus serotypes, and inadequate investment by vaccine designers have hindered vaccine advancement. Scrupulous attempts are aimed to develop antiviral drugs that can be used to manage DF and avoid the life-threatening episodes.^{23,20,25,27,30}

Bangladesh Perspective: Outbreak at a glance in Bangladesh: As of 20 November 2022, a total of 52 807 laboratory-confirmed dengue cases and 230 related deaths have been reported by the Ministry of Health & Family Welfare of Bangladesh since 1 January 2022 with a Case Fatality Rate (CFR) of 0.44%. Dengue is endemic in Bangladesh however a surge of cases started in June 2022. Currently, all eight divisions in the country are reporting cases and deaths. This is the second- largest outbreak since 2000, with the largest having occurred in 2019. The current dengue outbreak is unusual in its scale and seasonality. Between 1 January and 20 November 2022, a total of 52 807 dengue cases including 230 related deaths (Case fatality rate = 0.44%) were reported by the Ministry of Health & Family Welfare (MOHFW). According to information available for 40% of reported cases (n=20 982) the median age is 25 years (Range: 0 - 89) with males accounting for 60% of the cases. This is the second highest annual number of cases since 2000, the highest having occurred in 2019, when 101 354 cases including 164 deaths were reported. The most affected division is Dhaka, accounting for 70.6% of cases and 60.4% of deaths. Dhaka city, the largest city in Bangladesh, located in Dhaka division, has reported 64.5% (n= 34 071) of the total number of cases. Other affected divisions include

Chattogram division (13.2% of cases and 24.8% of deaths) and Khulna division (5.5% of cases and 4.8% of deaths). The high incidence of dengue cases this year is taking place in the context of an unusual amount of rainfall since June 2022, accompanied by high temperatures and high humidity which have resulted in an increased mosquito population throughout Bangladesh. In 2019, Bangladesh reported the highest number of dengue cases (101,354 cases), and the possible drivers of the outbreak were described as the introduction of a new serotype DENV-3, unusually prolonged wet season, and resistance to insecticides used by the local authorities.³¹

CONCLUSION

Dengue has evolved as a global life-threatening public health concern, affecting around 2.5 billion individuals in more than 100 countries. The physician should be aware about the varied clinical manifestations of this condition and ensure an early and adequate treatment plan. Future directions to combat this dreadful disease aim at methods of mosquito control, development of vaccine and antiviral drug regimen.

DISCLOSURE

None.

REFERENCES

1. Bhamarapravati N. Pathology and Pathogenesis of DHF. New Delhi: WHO Meeting. 1980. [Google Scholar].
2. Whitehorn J, Simmons CP. The pathogenesis of dengue. *Vaccine*. 2011;29:7221–7228. [PubMed] [Google Scholar].
3. Guzman MG, Kouri G. Dengue and dengue hemorrhagic fever in the Americas: Lessons and challenges. *J Clin Virol*. 2003;27:1–13. [PubMed] [Google Scholar].
4. Revised and Expanded ed. New Delhi: WHO. World Health Organization. Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever. 2011. [Google Scholar].
5. Whitehorn J, Farrar J. Dengue. *Br Med Bull*. 2010;95:161–73. [PubMed] [Google Scholar].
6. Geneva, Switzerland: World Health Organization. WHO. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control. Part 1.1.6: Dengue case classification. 2009;10–12. [Google Scholar].
7. Ranjit S, Kissoon N. Dengue hemorrhagic fever and shock syndromes. *Pediatr Crit Care Med*. 2011;12:90–100. [PubMed] [Google Scholar].
8. Ahmed FU, Mahmood CB, Sharma JD, Hoque SM, Zaman R, Hasan MH. Dengue fever and dengue haemorrhagic fever in children the 2000 outbreak in Chittagong, Bangladesh. *Dengue Bulletin*. 2001;25:33–39. [Google Scholar].
9. Narayanan M, Aravind MA, Thilothammal N, Prema R, Sargunam CS, Ramamurthy N. Dengue fever epidemic in Chennai—a study of clinical profile and outcome. *Indian Pediatr*. 2002;39:1027–1033. [PubMed] [Google Scholar].
10. Chen LH, Wilson ME. Dengue and chikungunya infections in travelers. *Curr Opin Infect Dis*. 2010;23:438–444. [PubMed] [Google Scholar].
11. Waterman SH, Gubler DJ. Dengue fever. *Clin Dermatol*. 1989;7:117–122. [PubMed] [Google Scholar].
12. Itoda I, Masuda G, Sugauma A, Imamura A, Ajisawa A, Yamada K, et al. Clinical features of 62 imported cases of dengue fever in Japan. *Am J Trop Med Hyg*. 2006;75:470–474.

REFERENCES

13. S.K. Austin, K.A. Dowd, B. Shrestha, C.A. Nelson, M.A. Edeling, S. Johnson, T.C. Pierson, M.S. Diamond, D.H. Fremont Structural basis of differential neutralization of DENV-1 genotypes by an antibody that recognizes a cryptic epitope *PLoS Pathog.* 2012;8(10). Article e1002930.
14. S. Benjathummarak, A. Yamanaka, T. Krasae, C. Pipattanaboon, S. Injampa, P. Pitaksajjakul, P. Ramasoota Plasmid DNA encoding neutralizing human monoclonal antibody without enhancing activity protects against dengue virus infection in mice *Asian Pac. J. Trop. Med.* 2021;14(7):299-308.
15. Guzman MG, Halstead SB, Artsob H, Buchy P, Farrar J, Gubler DJ et al. Dengue: A continuing global threat. *Nat Rev Microbiol.* 2010;8(Suppl):S7–16.
16. L.A. Byk, A.V. Gamarnik Properties and functions of the Dengue virus capsid protein *Annu. Rev. Virol.* 2016;3(1):263-281.
17. W. Dejnirattisai, W. Wongwiwat, S. Supasa, X. Zhang, X. Dai, A. Rouvinski, A. Jumnainsong, C. Edwards, N.T.H. Quyen, T. Duangchinda, et al. A new class of highly potent, broadly neutralizing antibodies isolated from viremic patients infected with dengue virus *Nat. Immunol.* 2015;16(2):170-177.
18. L.A. Guevarra Jr, K.J.O. Boado, F.B.B. Ceñidoza, M. Imbao, M.J.G. Sia, L.M.M Dalmacio. A synthetic peptide analog of in silico-predicted immunogenic epitope unique to dengue virus serotype 2 NS1 antigen specifically binds immunoglobulin G antibodies raised in rabbits *Microbiol. Immunol.* 2020;64(2):153-161.
19. S.J.F. Kaptein, O. Goethals, D. Kiemel, A. Marchand, B. Kesteleyn, J.F. Bonfanti, D. Bardiot, B. Stoops, T.H.M. Jonckers, K. Dallmeier et al. A pan-serotype dengue virus inhibitor targeting the NS3-NS4B interaction *Nature.* 2021;598 (7881) 504-509.
20. P. Songprakhon, T. Thaingtamtanha, T. Limjindaporn, C. Puttikhunt, C. Srisawat, P. Luangaram, T. Dechtawewat, C. Uthaiyibull, S. Thongsima, P.T. Yenchitsomanus et al. Peptides targeting dengue viral nonstructural protein 1 inhibit dengue virus production *Sci. Rep.* 2020;10 (1):12933.
21. A. Panya, N. Sawasdee, M. Junking, C. Srisawat, K. Choowongkamon, P.T. Yenchitsomanus. A peptide inhibitor derived from the conserved ectodomain region of DENV membrane (M) protein with activity against dengue virus infection *Chem. Biol. Drug Des.* 2015;86 (5):1093-1104.
22. Hrobowski et al. Peptide inhibitors of Dengue virus and West Nile virus infectivity. *Virology Journal.* 2005;2(1):49.
23. X. Shi, Y. Deng, H. Wang, G. Ji, W. Tan, T. Jiang, X. Li, H. Zhao, T. Xia, Y. Meng et al. A bispecific antibody effectively neutralizes all four serotypes of dengue virus by simultaneous blocking virus attachment and fusion. *MAbs.* 2016;8 (3):574-584.
24. Y.C. Lai, Y.C. Chuang, C.C. Liu, T.S. Ho, Y.S. Lin, R. Anderson, T.M. Yeh Antibodies against modified NS1 wing domain peptide protect against Dengue virus infection. *Sci. Rep.* 2017;7 (1) :6975.
25. S.W. Wan, Y.T. Lu, C.H. Huang, C.F. Lin, R. Anderson, H.S. Liu, T.M. Yeh, Y.T. Yen, B.A. Wu-Hsieh, Y.S. Lin. Protection against dengue virus infection in mice by administration of antibodies against modified nonstructural protein 1. *PLoS ONE.* 2014;9 (3):e92495.
26. P.B. A. Pinto, T.A.C. Barros, L.M. Lima, A.R. Pacheco, M.L. Assis, B.A.S. Pereira, A.J.S. Gonçalves, A.S. Azevedo, A.G.C. Neves-Ferreira, S.M. Costa et al. Combination of E- and NS1-derived DNA vaccines: the immune response and protection elicited in mice against DENV2 *Viruses.* 2022;14 (7):1452.
27. H. Xia, X. Xie, J. Zou, C.G. Noble, W.K. Russell, L.M.F. Holthausen, K.H. Choi, M.A. White, P.Y. Shi. A cocrystal structure of dengue capsid protein in complex of inhibitor *Proc. Natl Acad. Sci.* 2020;117:17992-18001.
28. H.A. Rothan, H. Bahrani, N.A. Rahman, R. Yusof Identification of natural antimicrobial agents to treat dengue infection: in vitro analysis of laticin peptide activity against dengue virus. *BMC Microbiol.* 2014;14:140.
29. P.C. Li, M.Y. Liao, P.C. Cheng, J.J. Liang, I.J. Liu, C.Y. Chiu, Y.L. Lin, G.J. Chang, H.C. Wu. Development of a humanized antibody with high therapeutic potential against dengue virus type 2 *PLOS Negl. Trop. Dis.* 2012;6 (5):e1636.
30. National Guideline link: <https://dghs.gov.bd/images/docs/Guideline/NationalGuidelineforDengue2018.pdf>.
31. Ahsan et al. Possible drivers of the 2019 dengue outbreak in Bangladesh : The need for a robust community level surveillance system. *J. Med. Entomol.* 2021;58:37-39.

Immunohistochemical Overexpression of P53 Protein in Premalignant and Malignant Uterine Cervical Lesion at Chittagong Medical College

Ireen Sultana^{1*} Farid Uddin Ahmed²

ABSTRACT



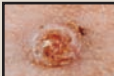
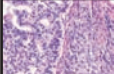
Background: Cervical cancer ranks as the 2nd most common cancer among Bangladeshi women between 15 and 44 years of age. The secondary biomarker p53 has been studied at various centers in the world and has been found to be dysregulated in cervical cancers. This study was undertaken to observe the expression and association of p53 in premalignant and malignant cervical lesions and also with their histopathological subtypes.

Materials and methods: The present cross-sectional descriptive study was conducted, from May 2018 to November 2018. Patients with premalignant and malignant cervical lesions of epithelial origin were included, while those with other pathological entities were excluded. A total of 50 patients were finally enrolled for this study. Cases with p53 expression in more than 10% cells were considered positive for p53 overexpression.

Results: Out of 50 cases, 24 cases were Cervical Intraepithelial Neoplasia (CIN), 25 cases were squamous cell carcinoma (SCC) and remaining 1 was adenosquamous carcinoma. Among 24 CIN cases, 70.8%, 25.0%, and 4.2% were respectively, CIN 1, CIN 2 and CIN 3. In SCC, 20.0% were well differentiated, 68.0% were moderately differentiated and rest 12% was poorly differentiated or undifferentiated. P53 expression was observed in 16 (32.0%) cases. Among CIN it was 16.7% and in cervical carcinoma cases 46.2% ($p=0.026$). Though P53 expression decreased with increasing grade of CIN and increased with increasing grade of SCC the differences were statistically insignificant ($p = 0.36$ and $p=0.45$ respectively).

Immunohistochemical Overexpression of P53 Protein in Premalignant and Malignant Uterine Cervical Lesion at Chittagong Medical College

GRAPHICAL ABSTRACT

Materials and methods	Results															
<p>Cross Sectional Descriptive Study</p> <p>Samples - 50</p>  <p>Age</p> <p><40 Years <input type="checkbox"/> 38%</p> <p>41 - 60 Years <input type="checkbox"/> 46%</p> <p>>60 Years <input type="checkbox"/> 16%</p> <p>Premalignant 48%</p> <p>Intraepithelial Neoplasia - 24</p>  <p>Malignant 52%</p> <p>Squamous Cell Carcinoma - 25</p>  <p>Adenosquamous Carcinoma - 1</p> 	<p>P53 Overexpression</p> <table border="1"> <thead> <tr> <th>Type of Lesion <input type="checkbox"/></th> <th>Positive <input type="checkbox"/></th> <th>Negative <input type="checkbox"/></th> <th>P53 Positivity <input type="checkbox"/></th> <th>p-Value</th> </tr> </thead> <tbody> <tr> <td>CIN (Premalignant) <input type="checkbox"/></td> <td>4 <input type="checkbox"/></td> <td>20 <input type="checkbox"/></td> <td>16.67%</td> <td></td> </tr> <tr> <td>Malignant <input type="checkbox"/> (Squamous Cell Carcinoma Adenosquamous Carcinoma)</td> <td>13 <input type="checkbox"/></td> <td>13 <input type="checkbox"/></td> <td>50% <input type="checkbox"/></td> <td>.006</td> </tr> </tbody> </table>	Type of Lesion <input type="checkbox"/>	Positive <input type="checkbox"/>	Negative <input type="checkbox"/>	P53 Positivity <input type="checkbox"/>	p-Value	CIN (Premalignant) <input type="checkbox"/>	4 <input type="checkbox"/>	20 <input type="checkbox"/>	16.67%		Malignant <input type="checkbox"/> (Squamous Cell Carcinoma Adenosquamous Carcinoma)	13 <input type="checkbox"/>	13 <input type="checkbox"/>	50% <input type="checkbox"/>	.006
Type of Lesion <input type="checkbox"/>	Positive <input type="checkbox"/>	Negative <input type="checkbox"/>	P53 Positivity <input type="checkbox"/>	p-Value												
CIN (Premalignant) <input type="checkbox"/>	4 <input type="checkbox"/>	20 <input type="checkbox"/>	16.67%													
Malignant <input type="checkbox"/> (Squamous Cell Carcinoma Adenosquamous Carcinoma)	13 <input type="checkbox"/>	13 <input type="checkbox"/>	50% <input type="checkbox"/>	.006												

Conclusion : P53 Overexpression can differentiate premalignant lesion from malignant lesion.

Sultana I et al.

Ctg Med Uni J. 2022;2(1): 15-19.

- Deputy College Inspector, Chittagong Medical University
 Chattogram, Bangladesh.
- Associate Professor of Community Medicine
 Rangamati Medical College, Rangamati, Bangladesh.

*Correspondence to: Dr. Ireen Sultana Cell: +88 01727 62 06 00 Email: ireen_sultana@yahoo.comSubmitted on 15th February 2022Accepted on 20th February 2022

Conclusion: Based on the study results P53 expression could be suggested as a marker for differentiating malignant from premalignant lesions.

Key words: Cervical Cancer; Premalignant cervical lesion; P53 Expression.

INTRODUCTION

Cervical cancer is a leading cause of death in women of reproductive age group worldwide.¹ The estimated

age-standardized incidence and mortality rates of cervical cancer in Bangladesh were approximately 10.6 and 7.1 per 100 000 women, respectively, in 2018.² While curable in the early stages, the prognosis for advanced stage cervical malignancy is poor.³ Today, great efforts have been made to identify novel biomarkers aiming to improve detection of the invasive cervical cancer at the earliest stage possible.

There are two types of biomarkers in cervical cancers, i.e., primary and secondary. The primary biomarker is HPV DNA. The secondary biomarkers include tumor suppressor genes and proto-oncogenes (P53, p16, c-fos protein, Fra-1, RB- protein, telomerase, and Ki67) potential serum markers (Squamous cell carcinoma antigen), cell adhesion matrix proteins (CD44) and miRNA.⁴

The secondary biomarker p53 has been studied at various centers in the world and has been found to be deregulated in cervical cancers. The p53 gene acts as tumor suppressor and is present on the short arm of chromosome 17 (17p13.1).⁵ It regulates proliferation of cells by promoting transcription of other genes controlling cell cycle.⁶ The wild type of p53 gene helps in DNA repair by delaying the progression from G phase to the S phase of cell cycle.⁶ This function is defective in the cells with mutant, stabilized, or inactivated p53 protein, and thus, these cells carry on replication of the abnormal DNA.⁷ The inactivation of wild-type p53 gene is the most common genetic alteration in human carcinogenesis.⁸ Various authors have reported the variable expression of p53 in premalignant and malignant lesions of cervix.⁹⁻¹⁵

This study was undertaken to observe the expression and association of p53 and grades of p53 in premalignant and malignant cervical lesions and also with their histopathological subtypes.

MATERIALS AND METHODS

The present cross sectional descriptive study was conducted in the Department of Pathology, at a tertiary care teaching institute of Chattogram, Bangladesh from May 2018 to November 2018. Patients with premalignant and malignant cervical lesions of epithelial origin diagnosed on small biopsy or hysterectomy specimens were included, while those with other pathological entities were excluded. Cases with inadequate biopsy material were also excluded.

A total of 53 patients were finally enrolled for this study. The cervical biopsy and hysterectomy specimens received were processed for routine

□

paraffin embedding, and 3 to 5 μ m thick sections were made from paraffin-embedded blocks. These sections were stained with hematoxylin and eosin (H and E) and also for p53 antibody using polymerbased immunohistochemistry kit of DAKOLSAB+ Kit peroxidase (Dako Corporation Den-mark) along with appropriate positive controls. All microscopic slides were evaluated for histomorphological and immunohistochemical staining pattern.

P53 scoring was assessed by estimating the percentage of positively stained nuclei in fields of their maximum density with a 40 \times objective in 10 high-power fields. Cases with p53 expression in more than 10% cells were considered positive for p53 overexpression. In the present study, the following semiquantitative grading system for p53 expression was used. Percentage of cells showing p53 expression was counted in 10 HPF and p53 expression was graded into gpor grades. No staining (0), 1+ (1% to 10% cells showing p53 expression), 2+ (10% to 50% cells showing p53 expression) and 3+ (more than 50% cells showing p53 expression).

Data were analyzed for descriptive statistics in terms of frequency and percentage. Association of p53 expression in premalignant and malignant lesions was compared by applying Pearson's Chi-square test. Statistical analysis was performed using SPSS version 23 and $p < 0.05$ was considered statistically significant at 95% significance level.

RESULTS

In the present study, of total 50 cases, 52.0% of cases represented malignant lesions and 48.0% of cases represented pre-malignant lesions. A largest number of cases were observed in the age range of 41–60 years comprising 46.0%, followed by age range of <40 years, comprising 38.0%. Only 16.0% of cases were observed in elderly females more than 60 years. The mean age of presentation was 45.1 ± 14.7 years. Among the 24 premalignant lesions, CIN 1 was more common comprising 70.8% of cases, while CIN 2 and CIN 3 comprised only 25.0% and 4.2% of the premalignant cases respectively. Among the malignant cases, only two histological types were observed, i.e., Squamous Cell Carcinoma (SCC) and Adenocarcinoma, majority being SCC, and only one is adenocarcinoma. In the present study, 32.0% of cases were positive for p53 overexpression, while 68.0% were negative.

Table I Demographic and clinical characteristics of the patients

Variables	Frequency	Percentage
Age		
<40 years	19	38.0
40-60 years	23	46.0
>60 years	8	16.0
Histological type		
Cervical Intraepithelial Neoplasia (CIN)	24	48.0
CIN 1	17	70.8
CIN 2	6	25.0
CIN 3	1	4.2
Squamous cell carcinoma	25	50.0
Well differentiated (Grade I)	17	70.8
Moderately differentiated (Grade II)	6	25.0
Poorly differentiated (Grade III)	1	4.2
Adenosquamous carcinoma	1	2.0
P 53 IHC score		
0	25	50.0
1+	9	18.0
2+	9	18.0
3+	7	14.0
P 53 expression		
Negative	34	68.0
Positive	16	32.0

Among the premalignant lesions, 16.7% of cases were positive for p53 overexpression, while among the malignant lesions, 46.2% were positive for p53 overexpression and the results were statistically significant ($p = 0.026$). However, there was no significant association between grades of CIN and p53 overexpression. Similarly, no significant association was found between grades of SCC and p53 overexpression.

Table II Association between histopathological grade and p53 expression

Variables	P53 over expression		p value
	Negative	Positive	
CIN (n=24)			
CIN 1	13 (65.0)	4 (100.0%)	
CIN 2	6 (30.0)	0 (0.00%)	0.360
CIN 3	1 (5.0)	0 (0.00%)	
SSC (n=25)			
Grade I	2 (15.4)	3 (25.0)	
Grade II	9 (69.2)	8 (66.7)	0.450
Grade III	2 (15.4)	1 (8.3)	
Lesion type (n=50)			
Premalignant (24)	20 (83.33%)	4 (16.67%)	0.06
Malignant (26)	13 (50)	13 (50)	

Among more than 60 years age group all the cases were malignant lesions and in the age group of less than 40 years the majority (73.7%) of the cases were premalignant and the association between age range and premalignant/malignant lesions was statistically significant ($p=0.002$). However, there was no significant association between age group and p53 overexpression ($p=0.285$).

Table III Association age group with histopathological type and P53 overexpression

Variables	Age group			p value
	<40 years	40-60 years	>60 years	
Lesion type				
Malignant	14 (73.7)	10 (43.5)	0 (0)	0.002
Premalignant	5 (26.3)	13 (56.5)	8 (100.0)	
P53 overexpression				
Negative	12 (63.2)	18 (78.3)	4 (50.0)	0.285
Positive	7 (36.8)	5 (21.7)	4 (50.0)	

DISCUSSION

In this study, among the 50 studied cases, there were 24 cases of CIN, 25 cases of SCC and one cases of adenosquamous carcinoma. The malignant cases were significantly older than the premalignant cases in the present study. This finding was correlated with other studies.^{16,18} Present study revealed a wide spectrum of histopathological subtypes of carcinoma of cervix. Among 24 CIN, maximum (70.8%) cases were in CIN-1 followed by 25% in CIN-2 and the 4.2% were in CIN-3. In SCC, 20.0% were well differentiated, 68.0% were moderately differentiated and rests of the 12% were poorly differentiated or undifferentiated. Among 26 cervical carcinoma cases only one case was adenosquamous carcinoma and rest 25 were SCC. These spectrums of histopathological subtypes are in agreement with the studies conducted in and around our country.^{16,19,20}

In the current study p53 expression was observed in 46.2% of cervical carcinoma cases. In various studies, the range of p53 positivity in cervical carcinoma was observed to be 17.1% to 87.0%. Some studies have showed high p53 positivity, whereas others have showed a lower positivity of p53 in cervical cancer (Table IV). Among CIN p53 positivity was observed in 16.7% cases. In various studies, the range of p53 positivity in CIN was observed to be 15.0% to 66.7%. Corresponding figures in different studies are shown in the Table IV.

Table IV Comparison of p53 expression in cervical premalignant and malignant lesions in different studies including the present one

Name of author	Year	P53 overexpression	
		In CIN (%)	In cervical carcinoma (%)
Hunt et al. ¹¹	1996	--	17.1%
Jeffers et al. ²³	1994	42.9%	--
Dimitrakakis et al. ²⁵		--	--
Tan et al. ¹⁶	2007	66.7%	87.0%
Tan et al. ²²	2008	--	85.2%
Sandhu & Shivakumar ²¹	2016	--	86.7%
Khalissa et al.	2017	--	24.7%
Babiker et al. ²⁴	2018	--	57.3%
Preset study	2019	16.7%	46.2%

In the present study we demonstrated negative and positive expression of P53 protein by immunohistochemistry in 52% (13/24) and 48% (12/24) of SCC cases respectively. Regarding adenocarcinoma samples, there was only one case and it showed negative expression (100%). Similar to our study Khalissa et al. observed that, the P53 protein was absent in 75.32% of SCC cases and almost absent in adenocarcinoma samples where only 7.70% of cases were positive.²⁴ Researchers concluded that, P53 expression, detected by immunohistochemistry, did not appear to be a prognostic marker for cervical cancer. However, these findings do not reflect the true population because there were very few cases of adenocarcinomas in both the studies.

Conflicting data concerning P53 over-expression in relation to the grade of invasive cervical carcinoma have been reported.^{27,28} In our study, there was a single case of CIN 3 which was found negative for P53. Out of 6 cases of CIN 2, all cases were found negative for P53. In fact, all of the 4 positive cases in CIN were in grade 1. This finding was in line with other study.²⁹ The varying range in different studies could be attributed to the composition of the study population, different specimen fixation techniques, antigen retrieval methods, different sample size, sensitivity and specificity of different antibodies used, and different modes of scoring systems and interpretations of the results.

LIMITATION

The result of the present study should be interpreted in light of the following limitations. First, the sample size was small and investigated in a single center. Second, we did not include any non-malignant healthy cervical tissue as control to see P53 expression.

CONCLUSION

The present study showed the expression of P53 is greater in the malignant cervical neoplasms than pre-malignant cervical lesions, suggesting that P53 overexpression can be used as a prognostic parameter in cervical neoplasm.

RECOMMENDATION

A large scale prospective study with standardized techniques is desirable to validate the findings of the present study.

ACKNOWLEDGEMENT

Both of the authors express their gratitude to the Principal, CMC and staffs of Department of Pathology, CMC, Chattogram.

CONTRIBUTION OF AUTHORS

IS-Conception, acquisition of data, drafting & final approval.

FUA-Design, analysis of data, interpretation of data, critical revision & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. Cervical Cancer. WHO — Cervical cancer. 2019. □
<http://www.who.int/cancer/prevention/diagnosis-screening/cervicalcancer/en/>.
2. Sankaranarayanan R, Bhatla N, Gravitt PE, Basu P, Esmay PO, Ashrafunnessa KS, et al. Human Papillomavirus Infection and Cervical Cancer Prevention in India, Bangladesh, Sri Lanka and Nepal. Vaccine. 2008;26. □
<https://doi.org/10.1016/j.vaccine.2008.05.005>.
3. Fowler JR, Maani EV, Jack BW. Cervical Cancer. [Updated 2021 Jul 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. 2021.
<https://www.ncbi.nlm.nih.gov/books/NBK431093/>.
4. Volkova LV, Pashov AI, Omelchuk NN. Cervical Carcinoma: Oncobiology and Biomarkers. International journal of molecular sciences. 2021;22(22):12571.
5. Levine AJ, Momand J, Finlay CA. The p53 tumour suppressor gene. Nature. 1991;351(6326):453-456.
6. Finlay CA, Hinds PW, Levine AJ. The p53 proto-oncogene can act as a suppressor of transformation. 1989;57:1083-1093.
7. Hollstein M, Sidransky D, Vogelstein B, Harris CC. P53 mutations in human cancers. Science. 1991;253:49-53.
8. Bartek J, Bartkova J, Vojtesek B, Stakova Z, Lukas J, Rejthar A, et al. Aberrant expression of the p53 oncoprotein is a common feature of a wide spectrum of human malignancies. Oncogene. 1991;6:1699-1703.
9. Levine AJ, Perry ME, Chang A, Silver A, Dittmer D, Wu M, et al. The 1993 Walter Hubert Lecture: The role of the p53 tumour suppressor gene in tumorigenesis. Br J Cancer. 1994;69:409-416.
10. Anwar K, Nakakuki K, Imai H, Shiraiishi T, Inuzuka M. Infection of human papillomavirus (HPV) and p53 overexpression in human female genital tract carcinoma. J Pak Med Assoc. 1996;46:220-224.
11. Hunt CR, Hale RJ, Buckley CH, Hunt J. P53 expression in carcinoma of the cervix. J Clin Pathol. 1996;49:971.
12. Crawford RA, Caldwell C, Iles RK, Lowe D, Shepherd JH, Chard T, et al. Prognostic significance of the bcl-2 apoptotic family of proteins in primary and recurrent cervical cancer. Br J Cancer. 1998;78:210-214.
13. Giarnieri E, Mancini R, Pisani T, Alderisio M, Vecchione A. Msh2, mlh1, fhit, p53, bcl-2, and bax expression in invasive and in situ squamous cell carcinoma of the uterine cervix. Clin Cancer Res. 2000;6:3600-3606.
14. Vasilescu F, Ceau u M, T nase C, St ncuлесcu R, Vl descu T, Ceau u Z, et al. P53, p63 and ki-67 assessment in HPV-induced cervical neoplasia. Rom J Morphol Embryol. 2009;50:357-361.
15. Shukla S, Dass J, Pujani M. P53 and bcl2 expression in malignant and premalignant lesions of uterine cervix and their correlation with human papilloma Virus 16 and 18. South Asian J Cancer. 2014;3:48-53.
16. Tan GC, Sharifah NA, Salwati S, Shiran MS, Hatta AZ, Ng HO. Immunohistochemical Study of p53 Expression in Premalignant and Malignant Cervical Neoplasms. Medicine & Health. 2007;2(2): 125-132.
17. Patel M, Jain M, Lotlikar R. Histopathological spectrum of cervical lesions—Our institute experience. Indian J Pathol Oncol. 2020;5:338-340.
18. Saravanan S, Arnold J, Arul P. Histomorphological Spectrum of lesions of the cervix, a Retrospective Study in a Tertiary Care Hospital. Journal of Evolution of Medical and Dental Sciences. 2015;4(59):10326-10330..
19. Zebunnesa M, Karim MM, Dhar S, Nessa K, Begum K. Clinical Profile of Patients with Carcinoma Cervix in a Tertiary Level Hospital. Journal of Bangladesh College of Physicians and Surgeons. 2017;35(3):110-114.
20. Ferdous J, Begum SA, Nahar Q, Khatun SF, Khatun S. Presentation of invasive cervical cancer in Bangladesh. Bangabandhu Sheikh Mujib Medical University Journal. 2013;6(1):29-32.
21. Sandhu JK, Shivakumar S. Study of p53 in cervical intraepithelial neoplasia and carcinoma cervix with clinico-pathological correlation. Int J Sci Stud. 2016;4(1):208-214.
22. Tan GC, Sharifah NA, Shiran MS, Salwati S, Hatta AZ, Paul-Ng HO. Utility of Ki-67 and p53 in distinguishing cervical intraepithelial neoplasia 3 from squamous cell carcinoma of the cervix. Asian Pac J Cancer Prev. 2008;9:781-784.
23. Jeffers MD, Richmond J, Farquharson M, McNicol AM. p53 immunoreactivity in cervical intraepithelial neoplasia and non-neoplastic cervical squamous epithelium. Journal of clinical pathology. 1994;47(12):1073-1076.
24. Khalissa D, Abdelhalim K, Xie X, Li Y, Soraya O, Abbes M. Immunohistochemical Expression of p53 and Bcl-2 in Algerian Cervical Carcinoma. Biomedical & Pharmacology Journal. 2018;11(1): 67-75.
25. Dimitrakakis C, Kymionis G, Diakomanolis E, Papaspyrou I, Rodolakis A, Arzimanoglou I, et al. The possible role of p53 and bcl-2 expression in cervical carcinomas and their premalignant lesions. Gynecol Oncol. 2000;77(1):129-136.
26. Babiker AY, Almatroudi A, Allemailem KS, Husain NKOS, Alsammani MA, Alsahli MA, et al. Clinicopathologic Aspects of Squamous Cell Carcinoma of the Uterine Cervix: Role of PTEN, BCL2 and P53. Applied Science. 2018;8:2124.
27. Baythoon SJ, Ali HH, Qasim BJ. Immunohistochemical Expression of P53 in Invasive Cervical Carcinoma (A Clinicopathological Study). Iraqi Journal of Medical Science. 2008; 6 (2):90-102.
28. Cheah PL, Looi LM. P53 immunohistochemical expression: Messages in cervical carcinogenesis. Pathology. 2002; 34:326-331.
29. Thakrar M, Mathur K. Immunohistochemical study of p53 expression as proliferative index in neoplasia of the uterine cervix. International Archives of Integrated Medicine. 2017; 4(12): 16-25.

A Comparative Study of Clinicobacteriological Profile of Sepsis between Neonatal (0-28 days) and Post Neonatal Age (29-90 days) in a Non-Government Medical College Hospital









Rokshana Ahmed^{1*} Mohammad Nazmul Huda¹ Qutrat-E-Elahi² Enshad Ekram Ullah³
Feroza Akter⁴ Mohammad Muslim Uddin⁵

ABSTRACT

Background: Young infants are considered a special group because these infants have special characteristics that they can become sick and die very quickly from serious bacterial infections. This descriptive cross-sectional study was carried out to assess clinical characteristics of sepsis between neonatal (0-28 days) and post neonatal age (29-90 days) as well as isolation of organism causing sepsis.

A Comparative Study of Clinicobacteriological Profile of Sepsis between Neonatal (0-28 days) and Post Neonatal age (29-90 days) in a Non Government Medical College Hospital

GRAPHICAL ABSTRACT

Materials and methods	Results			
<p>Cross Sectional Comparative Study</p> <p>Samples Size</p>  <p>Neonatal Age Group □ - 50</p>  <p>Postneonatal Age Group □ - 50</p>	Clinical Profile			
	Variable □	Neonate (50) □	Postneonate (50) □	p-value
	Poor Feeding □ 	24 (32) □	17 (19.1) □	0.155
	Fever □ 	15 (20) □	28 (31.5) □	0.009
	Convulsion □ 	5 (6.7) □	3 (3.4) □	0.461
	Fast Breathing □ 	24 (32) □	37 (41.6) □	0.008
	Blood Culture Profile			
	Variable □	Neonate (50) □	Postneonate (50)	
	Culture Positivity □	12% □	10%	
	Culture Negativity □	88% □	90%	
Bacteriological Profile				
Organism □	Neonate (6) □	Postneonate (5) □	p-value	
Klebsiella □ 	3 □	1 □	.303	
Coagulase negative-Staphylococcus □ 	0 □	3 □	.02 □	

Conclusion : Presentation varies in neonatal and Postneonatal age. Bacteriological profile is also difference in two group. Fast breathing and fever are significantly higher in Post neonatal age. Only Coagulase negative Staphylococcus is significantly higher in Postneonatal age. There is no significant difference with respect to other bacteria between two groups.

Ahmed R et al.

Ctg Med Uni J. 2022;2(1): 20-24.

- Associate Professor of Paediatrics
□ Chattagram International Medical College, Chattogram, Bangladesh.
 - Junior Consultant of Paediatrics
□ Chattagram International Medical College, Chattogram, Bangladesh.
 - Associate Professor of Medicine
□ Chittagong Medical College, Chattogram, Bangladesh.
 - Associate Professor of Neonatology
□ Chattagram Maa-O-Shishu Hospital Medical College, Chattogram, Bangladesh.
 - Professor of Paediatrics
□ Chattagram International Medical College, Chattogram, Bangladesh.
- *Correspondence to: **Dr. Rokshana Ahmed**
□ Cell: +88 01946 99 95 53
□ Email: drrokshanaahmed@gmail.com

Submitted on □ 25th January 2022
Accepted on □ 20th February 2022

Materials and methods: This cross sectional comparative study was conducted in the Department of Paediatrics of Chattagram International Medical College Hospital from July 2019 to December 2019. Young infants 0-90 days presenting with the features of sepsis were enrolled.

Results: In this study, it was observed that in neonatal period, majority (43.8%) of patients belonged to age 2-10 days. The mean age was found 5.7+/-3.4 days. In post neonatal age, majority (40%) patients belonged to age 29-44 days. Regarding sign of sepsis in neonatal age common presentations were not feeding well and fast breathing (32% each) followed by fever (20%), convulsion (6.7%), movement when stimulated (6.7%) and grunting (2.7%). In post neonatal age group, most common presentations were fast breathing (41.6%), followed by fever (31.5%), not feeding well (19.1%),

convulsion (3.4%), grunting (3.4%) and movement when stimulated (1.1%). Among them, most common organism was Klebsiella (n=3,50%) followed by Pseudomonas (n=2, 33.3%) and Staphylococcus aureus (n=1, 16.7%). Among them, 3 (60%) was coagulase -ve Staphylococcus which was the highest, followed by Klebsiella and Staphylococcus aureus (n=1, 20% for each).

Conclusion: Presentation varies in neonatal and postneonatal age. Bacteriological profile is also difference in two group. Fast breathing and fever are significantly higher in Post neonatal age. Only Coagulase negative Staphylococcus is significantly higher in postneonatal age. There is no significant difference with respect to other bacteria between two groups.

Key word: Antimicrobial susceptibility; Clinico-bacteriological; Mortality; Neonatal; Sepsis.

INTRODUCTION

Neonatal period is defined by the age of infants at 0 days to 28 days. It is the time when the infants are particularly vulnerable to serious infections.¹⁻³ First week of life has the highest vulnerability to acquire serious infections which are called “early-onset neonatal sepsis”, with very high mortality.⁴⁻⁵ As for the neonates, the infants at the (29-90) days also at a higher risk of mortality from infections than at later ages.^{2,6} It has been suggested the immune system requires the first two to three months of infantile life to steadily mature up.⁶⁻⁹ The Integrated Management of Childhood Illness (IMCI), formulated by WHO since 1992 has divided the management of childhood illness, that is children aged 2 months up to 5 years and that of young infants below 2 months of age.¹⁰ According to this guideline, this, stratification is because of the very idea that the young infants below 3 months have the same special characteristics, that they can become sick and die very quickly from serious bacterial infections.¹¹ It is necessary to develop research priorities to understand the critical aspects of the clinico-bacteriological presentation of very severe disease in this age group, for the prevention of similar infections in the future.

Neonates are vulnerable to serious infections as are infants of 29-90 days of age. Considering the fact, an ample amount of research has been done on neonatal infections both in the developed as well as developing countries. But little or no such research has been found on serious in infants of 29-90 days of age. Furthermore, such studies on “very severe disease” in young infants are ever deficient in Bangladesh. This study was conducted to understand the clinico-bacteriological profile of sepsis in young infants and compare it from neonatal and post neonatal age.

MATERIALS AND METHODS

This cross-sectional comparative study conducted at the Department of Paediatrics, Chatagram International Medical College Hospital from July 2019 to December 2019. Informed written consent was obtained from a parent or legal guardian of each patient who enrolled in the study. Young infants 0-90 days presented with sign of very severe disease defined as having either "convulsion, not feeding well/unable to feed, grunting, fast breathing, fever 99.5 degree Fahrenheit or feels cold, movement when stimulated or no movement at all" were enrolled consecutively as the study population. Exclusion criteria were young infants with a congenital anomaly and sick infants. According to the present inclusion and exclusion criteria 100 patients (50 patients aged 0-28 days and 50 patients 29-90 day). History and clinical examination findings were noted in a case record form. Blood was collected with all aseptic precautions for doing blood culture. Blood culture was done in chocolate, blood and McConkey agar media by lysis direct plating method under strict quality control. results of blood culture were included in the appropriate sections of case record form.

Statistical analysis were carried out by using the Statistical Package for Social Science Version 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA).

Informed written consent was obtained from each parent before enrollment into study. Ethical clearance for the study was taken from the Ethical Committee of Chattagram International Medical College.

RESULTS

A total of 100 patients were enrolled: 50 from each of the neonatal and post-neonatal periods. Of the neonatal age group (0-28 day) patients, majority (44%) belonged to age 2-10 days (Table I). The mean age was found (5.7±3.4) days with range from 3 to 9 days. In neonatal age, 32(64%) of patients were male and 18(36%) were female.

Table I Distribution of the study patients by demographic variables (n=50) neonatal age

Demographic variable	Number of patients	Percentage
Age (In days)		
0-9	21	43.8
10-18	15	30
19-28	14	26.2
Mean±SD		5.7±3.4
Range (Min, max)		3-9
Gender		
Male	32	64
Female	18	36

Of the post-neonatal age (29-90 days) patients, majority (40%) belonged to age 29-44 days (Table II). Of this group 30(60%) were male and 20(40%) were female.

Table II Distribution of study population by age and sex (n=50) post neonatal age

Demographic variable	Number of patients	Percentage
Age (In days)		
29-44	20	40
45-60	8	16
61-75	9	18
76-90	13	26
Mean±SD	32.4±7.4	
Range (Min, max)	31-40	
Gender		
Male	30	60
Female	20	40

Among neonatal age, the most common clinical presentation of sepsis as shown in Table III, were “not feeding well” and fast breathing (32% each), followed by fever (20%), convulsion (6.7%), movement when stimulated (6.7%) and grunting (2.7%). In post neonatal age group, most common presentation were fast breathing (41.6%), followed by fever (31.5%), not feeding well (19.1%), convulsion (3.4%), grunting (3.4%) and movement when stimulated (1.1%). The presentation significantly differed between neonatal and post-neonatal period, as fast breathing (p-value 0.008), fever (p-value 0.009) were the predominant presentations in the post-neonatal group which was not the same in the neonates.

Table III Clinical profile of sepsis between neonatal and post neonatal age group

Signs of sepsis	Neonate (0-28 days)	Post neonate (29-90 days)	p-value
Convulsion	5 (6.7)	3 (3.4)	0.461
Not feeding well	24 (32)	17 (19.1)	0.155
Grunting	2 (2.7)	3 (3.4)	0.646
Fast Breathing	24 (32)	37 (41.6)	0.008
Fever	15 (20)	28 (31.5)	0.009
Movement when stimulated	5 (6.7)	1 (1.1)	0.092

Value in parentheses indicate percentage.

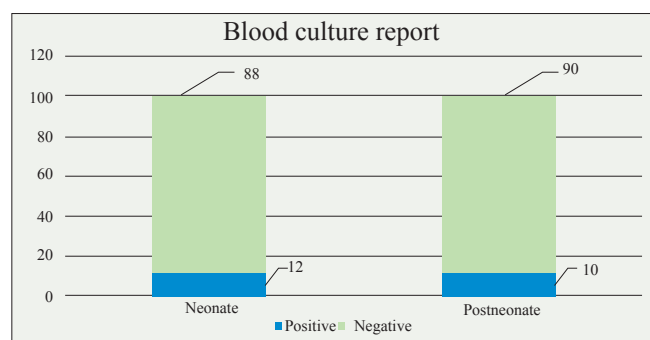


Figure 1 Distribution of study patient by blood culture

In neonatal age group, 12% was found blood culture positive and in post neonatal age group, 10% was blood culture positive (Fig 1).

In both age groups, 11 patients were found blood culture positive (Table IV). Among them 6, (54.5%) were Klebsiella, 2 (18.2%) were Pseudomonas, 2 (18.2%) were Staphylococcus aureus and 1 (9.1%) was coagulase –ve Staphylococcus.

Table IV Organisms found in culture positive cases (n=11)

Organism	Neonate	Post-neonate
Klebsiella	3 (50)	1 (20)
Pseudomonas	2 (33.3)	0
Staphylococcus aureus	1 (16.7)	1 (20)
Coagulase negative Staphylococcus aureus	0	3 (60)

DISCUSSION

In this study, it was observed that majority (44%) of neonatal patients belonged to age 2-10 days and mean age was 5.7±3.4 days (Ranged from 2-9 days) where in post-natal age group majority (40%) of patients belonged to age 29-45 days and the mean age was 32.2±7.4 days (Ranged from 30 to 57 days). Adequate study was taken comparing sepsis among the neonatal and post-neonatal population. A study done in Bangladesh including infants aged 1 week to 3 months (7-90 days) presenting at the Outpatient or Emergency Department of a tertiary care hospital with very severe disease, and the mean age of young infants was 32 days (Range, 7-59 days).¹²

In this current study it was observed that majority patients were male in both age distribution. In neonatal age group it was 64% and Post neonatal age group it was 60%. Kalter et al. also found most (72%) of their study population to be male. Similarly, Talbert et al. found 42.0% of their <60 days study patients to be male.^{12,13}

In post neonatal age group, most common presentation was Fast breathing (41.6%), followed by fever (31.5%), not feeding well (19.1%), convulsion (3.4%), grunting (3.4%) and movement when stimulated (1.1%). Fast breathing (p-value 0.008), fever (p-value 0.009) were significantly higher in post neonatal age group. In the review by Opiyo & English, that reviewed five large prospective observational studies (n = 17 506 infants) it was shown that fever, fast breathing and history of convulsion were the commonest signs of very severe disease among 0-90 days infants and had the highest predictive value in diagnosing very severe disease or severe infection in these children.⁵ The above findings are consistent with the present study.

In our study blood culture positivity was observed in 12% and 10% of cases in the neonatal and post-neonatal age group respectively. It was shown by Downie et al.¹⁴ in their meta-analysis mentioned prevalence of bacteremia in infants for whom a blood culture was performed was 3–16%. In the large six country multi-center study by Hamer et al. 10.9% of infants (7–59 days of age) had blood culture positivity.^{14,15} Similarly, Talbert et al. found in the out born young infants, 10.0% had a positive blood culture, which is consistent with the present study.¹³ In the recent study by Jatsho et al. blood culture positivity rate in neonatal sepsis was found 14% only.¹⁶

In the current study, in neonatal age group, 6(12%) are found to be positive for blood culture. Among them Klebsiella and pseudomonas were the most prevalent. In the meta-analysis by Downie et al. among infants of 29-90 days, the most prevalent pathogens were E coli, Klebsiella, Pseudomonas, accounting for 59% (26–92%) of culture-positive sepsis cases.¹⁴ Another study from a resource-poor country, also demonstrated Klebsiella to be the most common pathogen in severe young infant sepsis.¹⁶ In the current study five patients were found blood culture positive in the post-neonatal population. Among them Coagulase negative staphylococcus was the most prevalent pathogen, comprising 60% (n=3) of the isolates, followed by Klebsiella and Staphylococcus aureus 20% (n=1) for each.

LIMITATION

- The study population was selected from one selected hospital in Chattogram city, so that the results of the study may not reflect the exact picture of the country.
- Sample size was small.
- The present study was conducted at a very short period of time.

CONCLUSION

Presentation varies in neonatal and postneonatal age. Bacteriological profile is also difference in two group. Fast breathing and fever are significantly higher in Post neonatal age. Only Coagulase negative Staphylococcus is significantly higher in postneonatal age. There is no significant difference with respect to other bacteria between two groups.

RECOMMENDATION

Further studies can be undertaken by including larger number of patients.

ACKNOWLEDGEMENT

The authors would like to express their special thanks to patients and their families for giving their valuable permission to use their data for this research.

CONTRIBUTION OF AUTHORS

RA-Conception, acquisition of data, drafting & final approval.

MNH-Acquisition of data, data analysis, drafting & final approval.

QEE-Acquisition of data, drafting & final approval.

FA-Interpretation of data, critical revision & final approval.

MMU-Design, Interpretation of data, critical revision & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. National Institute of Population Research and Training Ministry of Health and Family Welfare Dhaka, Bangladesh. BANGLADESH DEMOGRAPHIC AND HEALTH SURVEY 2014. The DHS Program ICF International Rockville, Maryland, U.S.A. Mitra and Associates Dhaka, Bangladesh. 2016.
2. Bhutta ZA, Darmstadt GL, Ransom EI. Using evidence to save newborn lives. Policy perspectives on newborn health. 2003.
3. D. KH, A. SJ, M H, G. B. Identifying sick children requiring referral to hospital in Bangladesh. Bulletin of the World Health Organization. 1997;75(Suppl1):65–75.
4. English M, Ngama M, Mwalekwa L, Peshu N. Signs of illness in Kenyan infants aged less than 60 days. Bull World Health Organ. 2004;82(5):323–329.
5. Opiyo N, English M. What clinical signs best identify severe illness in young infants aged 0-59 days in developing countries? A systematic review. Arch Dis Child. 2011;96(11):1052–1059.
6. Young Infants Clinical Signs Study Group. Clinical signs that predict severe illness in children under age 2 months: A multicentre study. Lancet. 2008;371(9607):135–142.
7. Government of the people's republic of Bangladesh Ministry of Health and Family Welfare, Management Information System. Health Bulletin 2011. Bangladesh: Ministry of Health & Family Welfare of Bangladesh. 2011.
8. Klein JO. Bacterial Sepsis and Meningitis. 5th ed. Remington JS, Klein JO, editors. Philadelphia: WB Saunders. 2001.
9. Lawn JE, Cousens S, Zupan J, Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: when? Where? Why? Lancet. 2005;365(9462):891–900.
10. Tallur SS, Kasturi AV, Nadgir SD, Krishna BV. Clinico-bacteriological study of neonatal septicemia in Hubli. Indian J Pediatr. 2000;67(3):169–174.
11. Levels and trends in child mortality report 2015 [Internet]. Wwww.un.org. [Cited 2021 Jul 18]. . <https://www.un.org/en/development/desa/population/publications/mortality/child-mortality-report-2015.asp>.
12. Kalter HD, Schillinger JA, Hossain M, Burnham G, Saha S, de Wit V, et al. Identifying sick children requiring referral to hospital in Bangladesh. Bull World Health Organ. 1997;75 (Suppl 1):65–75.
13. Talbert AWA, Mwaniki M, Mwarumba S, Newton CRJC, Berkley JA. Invasive bacterial infections in neonates and young infants born outside hospital admitted to a rural hospital in Kenya. Pediatr Infect Dis J. 2010;29(10):945–949.
14. Downie L, Armiento R, Subhi R, Kelly J, Clifford V, Duke T. Community-acquired neonatal and infant sepsis in developing countries: efficacy of WHO's currently recommended antibiotics--systematic review and meta-analysis. Arch Dis Child. 2013;98(2):146–154.
15. Hamer DH, Darmstadt GL, Carlin JB, Zaidi AKM, Yeboah-Antwi K, Saha SK, et al. Etiology of bacteremia in young infants in six countries. Pediatr Infect Dis J. 2015;34(1):e1-8.
16. Jatsho J, Nishizawa Y, Pelzom D, Sharma R. Clinical and Bacteriological Profile of Neonatal Sepsis: A Prospective Hospital-Based Study. Int J Pediatr. 2020;2020:1835945. doi: 10.1155/2020/1835945. PMID: 32952574; PMCID: PMC7481930

Study on Prevalence of Non Communicable Diseases among the Expatriates Attending in Chattagram International Medical College Hospital

Mohammad Kamrul Islam^{1*} Md Amir Hossain² Mehrunnisa Khanom¹
Md Razaul Karim³ Mohammed Jashim Uddin⁴ Mohammad Akhtarul Islam Chowdhury⁵







ABSTRACT

Background: Prevalence of Non-Communicable Diseases (NCDs) is increasing all over the world with a disproportionate differentiation of the developing and non-developing countries. The purpose of the study was to determine the prevalence as well as pattern of NCD among the expatriates of our population.

Materials and methods: In this hospital based case control type of observational study was held at Chattagram International

Study on Prevalence of Non Communicable Diseases among the Expatriates Attending in Chattagram International Medical College Hospital

GRAPHICAL ABSTRACT

Materials and methods	Results			
Case Control Study Case Expatriate - 100  Control Age and Sex matched Native Bangladeshi - 100 	Non Communicable Disease	Case	Control	p value
	Hypertension 	46%	34%	<.05
	Impaired Glycemic Status 	59%	41%	<.01
	Dyslipidemia 	81%	69%	<.05
	Ischemic Heart Disease 	11%	3%	<.03

Conclusion : Non Communicable disease in expatriate worker are significantly higher than native populations.

Islam M K et al.

Ctg Med Uni J. 2022;2(1): 25-29.

- Associate Professor (cc) of Medicine
Chattagram International Medical College
Chattogram, Bangladesh.
- Professor of Medicine
Chattagram International Medical College
Chattogram, Bangladesh.
- Assistant Professor of Medicine
Chattagram International Medical College
Chattogram, Bangladesh.
- Consultant of Endocrinology
Chattagram International Medical College Hospital
Chattogram, Bangladesh.
- Consultant of Cardiology
Chattagram International Medical College Hospital
Chattogram, Bangladesh.

*Correspondence to: **Dr. Mohammad Kamrul Islam**
Cell: +88 01818 24 74 35
Email: dr.kamrul11@gmail.com

Submitted on 25th January 2022

Accepted on 6th February 2022

Medical College Hospital (CIMCH). One hundred expatriates were selected on non-probability convenient sampling from July 2019 to June 2020. And age and sex matched one hundred native Bangladeshi were selected as control group. Expatriate workers were interviewed with a semi structured questionnaire about their demographic profile, lifestyle related information and self-reported non communicable disease status.

Results: Mean age of the expatriates was 41.41 (+10.78) whereas It was 38.17 (+10.76) in control group; 100% male in both case and control groups). Mean BMI was 25.6437kg/m² in the case and 24.9490kg/m² in the control group. 46% of the expatriates were hypertensive whereas it was 34% in the native Bangladeshi (p 0.05). The number of impaired Glycemic status (DM, IGT, IFG) was about one and half times in the case group compared to control group (Ratio 1.45:1) (p 0.01). 81% of expatriates were Dyslipidemic which was 69% in the control native Bangladeshi group. The prevalence of Ischemic heart disease was significantly more in the case (11% in the case and 3% in the control group, p 0.03).

Conclusion: The study showed that Non Communicable Diseases were more prevalent in the expatriate workers with numerous modifiable and non-modifiable risk factors of developing NCDs. These findings could be useful to draw the attention of health authorities to adopt preventive strategies against NCDs among the expatriates.

Key words: BMI; DM; Dyslipidemia; Expatriate; Hypertension; Non Communicable Diseases.

INTRODUCTION

Non Communicable Diseases (NCDs) are chronic conditions that do not result from an acute infectious process and hence are “not communicable. These diseases have prolonged course, not resolve spontaneously, and for which a complete cure is rarely achieved. Non Communicable Diseases (NCDs) are the leading cause of death globally, and one of the major health challenges of the 21st century. In September 2011, at the United Nations General Assembly in New York, a political declaration was made to strengthen global and national responses to prevent and control NCDs.¹ NCDs are by far the leading cause of death worldwide. In 2016, they were responsible for 71% (41 million) of the 57 million deaths which occurred globally.² Non Communicable Diseases (NCDs) are diseases of long duration, and are generally slow to progress.

The rapid rise of Non-Communicable Diseases (NCDs) represents one of the major health challenges to global development. NCDs were estimated to have contributed to almost 60% of deaths in the world and among them about 80% occur in the developing countries.³ NCDs are already of major importance in developed countries and are rapidly becoming a major public health threat in the developing world. These diseases constituted 43% of the global burden of disease in 1999. Based on current trends, by 2020 they will account for 73% of deaths and 60% of the disease burden in the developing countries.⁴

Prevalence of non-communicable diseases is increasing in developing and non-developing countries though disproportionately. A particular category of high-risk population comprises of millions of expatriate workers live outside Bangladesh.

The health of expatriates populations is influenced by multifaceted connections between mental health and physical conditions. Recently, a study has demonstrated that both personal and workplace characteristics are important factors influencing health.⁵

Black & Gregersen suggest that adjustment and mental health problems are more pronounced when there is a significant cultural difference between one's home country and the host country.⁶

The adjustment to a new country is also more difficult when the expatriate worker and his/her family fail to receive training and support before, during, and after an assignment.⁷

The World Report on Migration highlights the fact that, worldwide, expatriate workers lack equal access to health care.⁸

Multiple studies in the past have shown that there is a much higher prevalence of cardiovascular diseases risk factors among expatriates living in a foreign country compared to their own country of origin.^{9,10,11} Another study has associated high cardiovascular mortality among Asian immigrants with sedentary lifestyle, high serum triglycerides and low HDL cholesterol.¹²

The aim of the study was to determine the prevalence as well as pattern of NCD among the expatriates of our population.

MATERIALS AND METHODS

This hospital based case control study held in Chattagram International Medical College Hospital during the period of July 2019 to June 2020. All the patients attending the Inpatients and Outpatient Department of the Department of Medicine CIMCH were considered as study population. One hundred (100) patients who are expatriates attending IPD and OPD during the study period were as case are age and sex matched 100 Native Bangladeshi was as control. Inclusion criteria were: • Patients who resides at least 6 months outside Bangladesh at a stance, age >18 years, participants and or legally accepted guardians, who gave consent and willing to comply with study procedure. Exclusion criteria were: • Age 18 years or less, expatriates who are known cases of NCD patients before leaving country, pregnancy, patient or attendants unwilling to take part in the study.

Ethical clearance was taken from ethical committee of Chattagram International Medical College Hospital.

All expatriates attending the Outpatient Department or Inpatient Department of the Department of Medicine of CIMCH were assessed for eligibility. Informed written consent was obtained from participant. After consenting, the details of the patient's history including demographic information, clinical findings at presentation were recorded in case record form. The patients was advised to do the investigations as per study requirement.

The data were analyzed using the Statistical Package for Social Sciences 20.0 (SPSS, Chicago, IL, USA). p-value <0.5 was taken as significant.

RESULTS

A total 200 participants (100 Expatriates as case and 100 age and sex matched native Bangladeshi as control) were enrolled in the study from July 2019 to June 2020 to compare the prevalence of Non Communicable Diseases. No study subject was lost to follow up. So, the effective sample size was 200. The result of the study has presented in the following table and graphs.

Majority were married in both case and control group (91% and 85% respectively).

The major portions of the expatriates under study live in KSA(32%), followed by UAE(27%), Oman (13%) and Qatar (11%). Only 1% of the expatriates was living in Brunei and Italy. Their mean duration of stay was 15.04(+8.09) ranges from 1.6 year to 37 years.

There are variable occupation in the study subjects majority (19%) of the expatriates were sales man in occupation, followed by Mechanic (15%), service holder, Whereas in control group, the majority are service holder (35%), followed by business and driver.

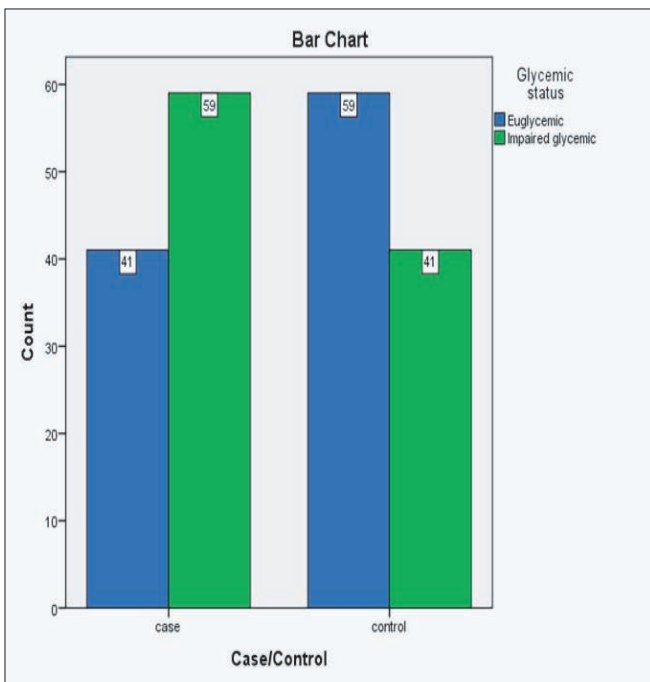


Figure 1 Glycemic status of the study population

Fifty nine (59%) of the expatriates were suffering from impaired glycaemia in contrast to 41% of the native Bangladeshi (p 0.01) (Figure 1).

Forty six (46%) of cases are hypertensive in comparison to 34% of the control group (p 0.05) (Table I).

Table I HTN Status of the study population

Cohort	HTN Status	Total	p
	Hypertensive	Normotensive	
Case	46	54	100
Control	34	66	100
Total	80	120	200

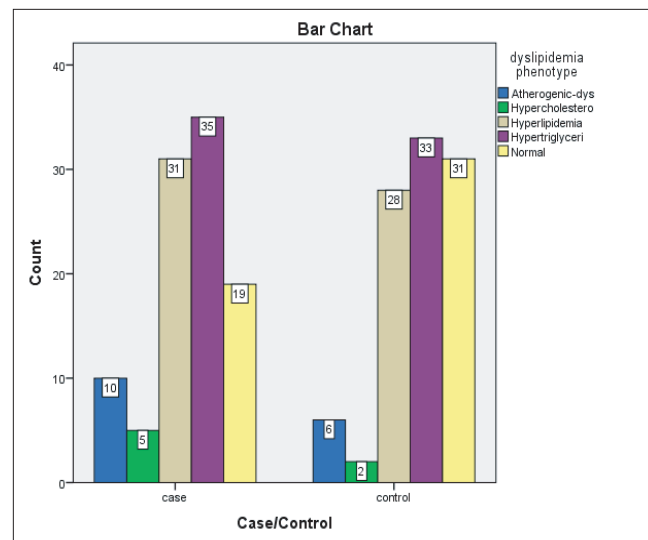


Figure 2 Dyslipidemia phenotype during the study of the study subjects

Nineteen (19%) of expatriates were in normal lipid profile whereas It was 31% in the native Bangladeshi control group (p 0.243) (Figure 2).

DISCUSSION

In the current study, median age of the 100 expatriates was 41 years, whereas It was 35.5 in the native Bangladeshi (Control group). The study population was solely male in gender. A study carried out in KSA showed The sample had a median age of 36 years.¹³ According to the Ministry of Labour in Saudi Arabia, the median age of expatriate workers in the country is 34 years.¹⁴ Another study in Majamah city of KSA shows the mean age of the participants is 35.25 years.¹⁵

Worldwide, the proportion of adults with a Body-Mass Index (BMI) of 25 kg/m² or greater increased between 1980 and 2013 from 28.8 to 36.9% in males, and from 29.8 to 38.0% in females. Further, the NCD risk factor collaboration predicts that these increasing trends will continue into the future.¹⁶

People from Asia have a higher risk of type 2 diabetes and cardiovascular disease at lower levels of Body Mass Index (BMI).¹⁷

On calculating the Basal Metabolic Index (BMI) it was found that more than 56% were in the overweight and obese category.

The measurement of blood pressure showed that 46% of the expatriates were hypertensive where as It was 34% in the control group. A study conducted in KSA shows 26.5% having a high normal systolic reading (120 – 139 mm Hg) while 19.2% recorded more than 140 mm of Hg. Similarly, 33.3% having a diastolic blood pressure reading of more than 90 mm of Hg. A sizeable number of participants (19.2%) shows a high normal diastolic reading between 80 – 89 mm of Hg reported by that study.¹⁸

In our study It was shown that the prevalence of impaired glycaemia was 59% among the expatriates and 41% among the native Bangladeshi population of the study subjects. A study on prevalence of diabetes in expatriates living in United Arab Emirates (UAE) shows Diabetes, based on fasting blood glucose ≥ 7.0 mmol/l or on self-report of previous diagnosis had an overall age-and-sex-adjusted prevalence of 19.1%. The highest prevalence was in Asians (16.4%) and in non-Emirati Arabs (15.2%), with lower prevalence seen in Africans and Westerners (11.9%).¹⁹

LIMITATION

Among the limitations of this study is that the sample size was small in both case and control group. Single center study with a limited number of cases makes our study findings difficult to generalize with the expatriate population.

CONCLUSION

Expatriate workers from Bangladesh are working in various countries mostly in Middle East. The significant rate of NCDs were found in the expatriate in comparison to native Bangladeshies. Non communicable diseases such as obesity, diabetes mellitus, hypertension, dyslipidemia, hyperuricemia and ischemic heart diseases are much more prevalent in the expatriates.

RECOMMENDATION

We can recommend that all the expatriates prior to leave Bangladesh should undergo a baseline screening for non communicable diseases and A periodic follow up schedule should be established for the expatriates for regular health checkup.

ACKNOWLEDGEMENT

We would like to express our thanks to expatriate workers.

CONTRIBUTION OF AUTHORS

MKI-Conception, design, acquisition of data, data analysis, manuscript writing & final approval.

MAH- Conception, critical revision & final approval.

MK-Data analysis, manuscript writing & final approval.

MRK-Interpretation of data, critical revision & final approval.

MJU- Design, drafting & final approval.

MAIC- Acquisition of data, drafting & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. WHO Global Coordination Mechanism on the prevention and control of NCDs. NCDs and Youth. Available form: <http://www.who.int/global-coordinationmechanism/ncd-themes/ncd-and-youth/en/>
2. Bonita R, de Courten M, Dwyer T, Jamrozik K, Winkelmann R. Surveillance of riskfactors for non-communicable diseases: The WHO STEP wise approach. Summary. WHO Geneva. 2001.
3. World Health Organization. Global status report on noncommunicable diseases 2010. WHO Geneva. 2011.
4. World Health Organization. WHO NCD Surveillance Strategy. http://www.who.int/ncd_surveillance/strategy/en/print.html.
5. Alkhamis A, Cosgrove P, Mohamed G, Hassan A. The personal and workplace characteristics of uninsured expatriate males in Saudi Arabia. *BMC Health Serv Res*. 2017;41:1-12.
6. Black, J.S. & Gregersen H.B. Antecedents to cross-cultural adjustment for expatriates in Pacific Rim assignments. *Human Relations*. 1991;44: 497-515.
7. Black, J.S., & Stephens, G.K. (1989). The influence of the spouse on American expatriate adjustment and intent to stay in Pacific Rim overseas assignments. *Journal of Management*. 1989;15: 529-544.
8. Newland K, McAuliffe M, Bauouz C. Recent developments in the global governance of migration: An update to the world migration report. 2018.
9. Elkum NI, Al-Arouj M, Sharifi M, Behbehani K, Bennakhi A.: Cardiovascular disease risk factors in the South Asian population living in Kuwait: a cross-sectional study; *Diabet Med*. 2014;31(5):531-539. doi: 10.1111/dme.12386. Epub 2014 Jan 22.
10. Chiu M1, Austin PC, Manuel DG, Tu JV; Comparison of cardiovascular risk profiles among ethnic groups using population health surveys between 1996 and 2007. *CMAJ*. 2010;182(8):E301-310. doi:10.1503/cmaj.091676. Epub 2010 Apr 19.
11. Cappuccio FP1, Cook DG, Atkinson RW, Strazzullo P.; Prevalence, detection, and management of cardiovascular risk factors in different ethnic groups in south London; *Heart*. 1997;78(6):555-563.
12. Cappuccio FP; Ethnicity and cardiovascular risk: Variations in people of African ancestry and South Asian origin. *J Hum Hypertens*. 1997;11(9):571-576.
13. Alkhamis AA, Miraj SS. Links between employment-related factors and physical and mental health among uninsured expatriate males in Saudi Arabia. *International journal of health sciences*. 2018;12(1):50.
14. Ministry of Labour. Saudi Labour Market Indicators, Riyadh Region. Riyadh: Ministry of Labour. 2009;124.
15. Carvalho AK, Menezes AM, Camelier A, Rosa FW, Nascimento OA, Perez-Padilla R, Jardim JR. Prevalence of self-reported chronic diseases in individuals over the age of 40 in São Paulo, Brazil: The PLATINO study. *Cadernos de saude publica*. 2012;28:905-912.
16. Akter S, Rahman MM, Abe SK, Sultana P. Prevalence of diabetes and prediabetes and their risk factors among Bangladeshi adults: A nationwide survey. *Bulletin of the World Health Organization*. 2014;92:204-213.
17. World Health Organization Expert Consultation. Appropriate body-massindex for Asian populations and its implications for policy and intervention strategies. *Lancet*. 2004;363(9403):157-163.
18. Sulaiman N, Elbadawi S, Hussein A, Abusnana S, Madani A, Mairghani M, Alawadi F, Sulaiman A, Zimmet P, Huse O, Shaw J. Prevalence of overweight and obesity in United Arab Emirates Expatriates: The UAE national diabetes and lifestyle study. *Diabetology & metabolic syndrome*. 2017 ;9(1):88.
19. <https://www.longdom.org/proceedings/high-prevalence-of-diabetes-in-expatriates-living-in-united-arab-emirates-uae-united-arab-emirates-national-diabetes-uae-33066.html>.

acute infectious diseases, exacerbation of chronic illness, etc.) or injuries that risks the loss of a limb.² To achieve this, immediate and urgent medical interventions are necessary. Although no accurate data is available on the number of lives or the Disability Adjusted Life Years (DALY) that have been saved through emergency care, a lot of conditions that burden middle income and low-income countries can be mitigated through this.

There are three major components in emergency medical care, namely, care in the community, care during transportation, and care on arrival to the healthcare facility.² Care in the community involves basic life saving measures that are taught to lay man so that in case of an emergency they can act promptly and save lives. Care during transportation involves, first of all, the availability of transportation services and second, the availability of life saving equipment within those vehicles. Finally, care on arrival refers to the availability of adequately trained emergency staff and sufficient equipment for immediate and satisfactory treatment of a patient on arrival to the healthcare facility.

Bangladesh is a country in south-east Asia with a population of over 161 million.³ However, when it comes to provision of health services for its population, this country suffers from both a shortage as well as a mal-distribution of healthcare workers across the country.⁴ According to a 2011 report by the ministry of health and family welfare, an estimated 3.05 physicians and 1.07 nurses provide services for every 10,000 population. Not just that, but health workers are highly concentrated in urban secondary and tertiary hospitals although majority of the population live in rural areas⁵.

Following these successes, little data is present on the current status of the emergency health services that the patients get at hospitals nowadays. Also, what remains an enigma is the level of services that patients receive in emergency settings when compared to international standards. The aim of this study is to evaluate the status of emergency health services at major hospitals of Chattogram city in Bangladesh and compare them to international standards.

MATERIALS AND METHODS

This cross-sectional type of observational study was conducted between August and October 2019 at 4 major hospitals in the Chattogram District. The hospitals were Chittagong Medical College Hospital (CMCH) Chittagong Port Hospital, Chittagong

General Hospital (CGH) and Bangladesh Railway Hospital. Permission was taken from appropriate authorities at the respective hospitals and a semi-structured questionnaire was used to interview the medical officer/ office staff on duty. A checklist was completed by the interviewer in the following way. Distances, lengths and breadths were manually measured in feet using a measuring tape. Patient data was obtained from registers. Duty roster was seen to evaluate the number of workers that should be present. All the equipment as well as the ambulances were seen by the investigator and the checklist was completed accordingly. any missing data, doubts or confusions were clarified by the on-duty staff at the time of data collection. The variables that were used included location of the emergency department within the hospital, the space and size of emergency rooms, availability of operation theatre, what equipment were present in the EMS kit, what machines were available, number of healthcare workers and their designations, availability of ambulance services with trained staff and what was the patient outcome.

Before commence the study necessary permission was taken from IRB.

RESULTS

The tables below show comparison between the available services at each of the four hospitals.

Table 1 Provision of care at Emergency Departments

	CMCH	CGH	Railway Hospital	Port Hospital
Access to emergency room	Convenient	Difficult	Convenient	Convenient
Hospital ambulance services	available not convenient	not convenient	convenient	very convenient.
Trained staff for ambulance service	Absent	Absent	Only one trained in first aid	Only for ICU ambulance and ambulance ship
Average doctor: patient ratio	1:131	1:18	1:30	1:10

Table II Number of healthcare workers in busiest shift at the Emergency Department

Name of Hospital	No. of Doctors	No. of nurses	No. of medical assistants	No. of MLSS
CMCH	2	5	4	2
CGH	1	4-5	1	1
Railway hospital	1	3	2	1
Port hospital	1	3	3	1

Table III Equipment available at Emergency Department

	CMCH	CGH	Railway Hospital	Port Hospital
GP set	✓	✓	✓	✓
Wound stitching and dressing equipment	✓	✓	✓	✓
Gauze	✓	✓	✓	✓
Band Aids	✓	✓	✓	✓
Glucometer	✓	✓	✓	✓
Nebulizer	✓	✓	✓	✓
Sucker Machine	✓	✓	✓	✓
Umbo bag	✓	✓	✓	✓
ECG machine	✓	□	□	✓
Defibrillator	□	□	□	□

Table IV List of available medicines and surgical equipment at Emergency Department*

Name of Hospital	CMCH	CGH	Railway Hospital	Port Hospital
Normal saline and other fluids	✓	✓	✓	✓
Antibiotics	□	□	□	✓
Painkillers	✓	✓	✓	✓
Antispasmodic	□	□	□	✓
Steroids	✓	□	□	✓
Sedatives	□	□	□	✓
IV fluids	✓	✓	✓	✓
Tetanus Toxoid	□	✓	□	□
TIG	□	□	✓	✓
Heparin	□	□	□	✓

*Some medicines were available at nearby pharmacies and hence were not present in the Emergency Department.

Table V Types of ambulance services available for patients

Name of Hospital	CMCH	CGH	Railway Hospital	Port Hospital
Normal ambulance	1	1	1	2
ICU ambulance	Not working	None	None	1
Ambulance ship	None	None	None	1
Air ambulance	None	None	None	None

DISCUSSION

According to the World Health Organization's emergency care system framework, there are three ways of responding to an emergency health situation: response at the scene, response while transferring patient and finally, response in the facility.⁶ While our study could not evaluate the response at the scene as it involves the general population, an idea about the response in the ambulance and in the facility could be obtained based on the questionnaire.

Among all four hospitals, only CMCH had the capability to provide emergency services beyond basic triage, recognition and resuscitation. Apart from Emergency Department and operation theatre, CMCH also had an ICU that managed critically ill patients. All the other hospitals had the potential to provide basic triage and resuscitation and then transfer to higher centers such as CMCH. In fact, this explains why the number of patients that approach the emergency department in CMCH is more than three times the number observed in all the other three hospitals combined. However, as observed in Table II, the number of healthcare workers is not so different from that in other hospitals thus illustrating how overworked they may be on a daily basis.

Tables IV and V shows the availability of equipment and drugs at the Emergency Departments. Apart from these, equipment like urinary catheters, nasogastric tubes and foley catheters were least available among all four departments and patients were sent on emergency basis to buy them when necessary. In a study by Mahfouz et al. no tracheostomy set was found in any of the emergency departments, however surgical equipment such as dressing drums, gauze, forceps and suturing equipment were readily available.⁷

According to the Department of Health in Abu Dhabi, U.A.E, all doctors, nurses working in the Emergency Department should have active certification in adult, pediatric and trauma resuscitation, be it a general medical practitioner (MBBS) or a specialist in internal medicine or surgery. The only persons exempted from this requirement are Emergency Medicine specialists.⁸ In this study, none of the medical officers that provided emergency medical services had any sort of specialized training in patient resuscitation.

In our study, most available ambulances, were geared with basic equipment such as a stretcher. This varies widely when considering developed nations where an ambulance is equipped with a monitor/ defibrillator, a spine board and a range of medications.⁹ Along with medical decision making, actions necessary to prevent unnecessary death or disability due to time-critical issues should be provided in emergency settings.⁴ However, not only in Chattogram, but across the country, golden hours are lost due to inability of ambulance staff or lack of equipment within ambulances to tend to patient needs.¹⁰ This can be improved by proper training of ambulance staff. One study in Ghana found commercial taxi and mini-bus drivers who were trained in first aid to be able to provide adequate pre-hospital care.¹¹

LIMITATION

Most of the hospital records only contained patient details and past treatment sheets could not be accessed due to patient confidentiality issues. Hence, quality of care could not be assessed in this study.

CONCLUSION

Lack of adequately trained Emergency Medical Officer in all 4 Hospitals. The most well equipped hospital was Port Hospital.

RECOMMENDATIONS

Few ways to improve the current condition are as follows:

- Different postgraduate courses to train the Emergency Medical Officers
- Ambulances need to have more equipment
- Pre-hospital care education must be provided to ambulance staff
- Take approaches to prevent overcrowding at Emergency Departments
- Color coding patients according to the internationally recognized triage algorithm
- Training lay-staff to color code for triage.

ACKNOWLEDGEMENTS

The authors would like to thank the staff and authority of the four hospitals for their permission and kind cooperation to conduct this study.

CONTRIBUTION OF AUTHORS

KS- Acquisition of data, manuscript writing & final approval.

MJU- Initial design, conception, data analysis, interpretation of data, critical revision & final approval.

DISCLOSURE

This study was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. Marsh RH, Rouhani SA, Pierre P, Farmer PE. Strengthening emergency care: experience in central Haiti. *The Lancet Global Health*. 2015;3: S5-7.
2. Sutnick AI, Wagner DK. Emergency medicine as an academic discipline. *JAMA* 1977; 238: 147-148.
3. Arnold JL, Dickinson G, Tsai MC, Han D. A survey of emergency medicine in 36 countries. *CJEM*. 2001; 3(2): 109-118.
4. Razzak JA, Kellermann AL: Emergency medical care in developing countries: Is it worthwhile? *Bull World Health Organ*. 2002; 80(11): 900-905.
5. DGHS & MIS. Health Bulletin 2019. Mohakhali. Dhaka. 2020; 132.
6. Teri Reynolds. WHO/Emergency Care. Emergency, trauma and acute care. Department for management of NCDs, disability, violence and injury prevention. 2015.
7. Mahfouz AA, Abdel Moneim I, Khan MY, Daffalla AA, Diab MM, El Gamal MN, Al Sharif AI. Primary health care emergency services in Abha district of southwestern Saudi Arabia. *Eastern Mediterranean Health Journal*. 2007; 13 (1): 103-112.
8. Investment and capacity management division. DOH standard for emergency departments and urgent care centers. Abu Dhabi, 2020. Accessed on 20/4/2020.
9. Boyle M, Wallis J, Suryanto S. Time to Improve Prehospital Care in Developing Countries. *Australasian Journal of Paramedicine*. 2016;13(3).
10. Tajmin T. Emergency medical care remains largely neglected. *The business standard*. 2020.
11. Mock NC, Tiska M, Adu-Ampofo M, Boakye G. Improvements in prehospital trauma care in an African country with no formal emergency medical services. *Journal of Trauma*. 2002 ;53:90-97.

Analysis of Chemical Composition of Urinary Stones: A Prospective Study

Mohamed Hasan Meah^{1*} Mohammad Monowar-Ul Haque²
Md Moklesur Rahaman³ Ata Mohammad Mozassem⁴

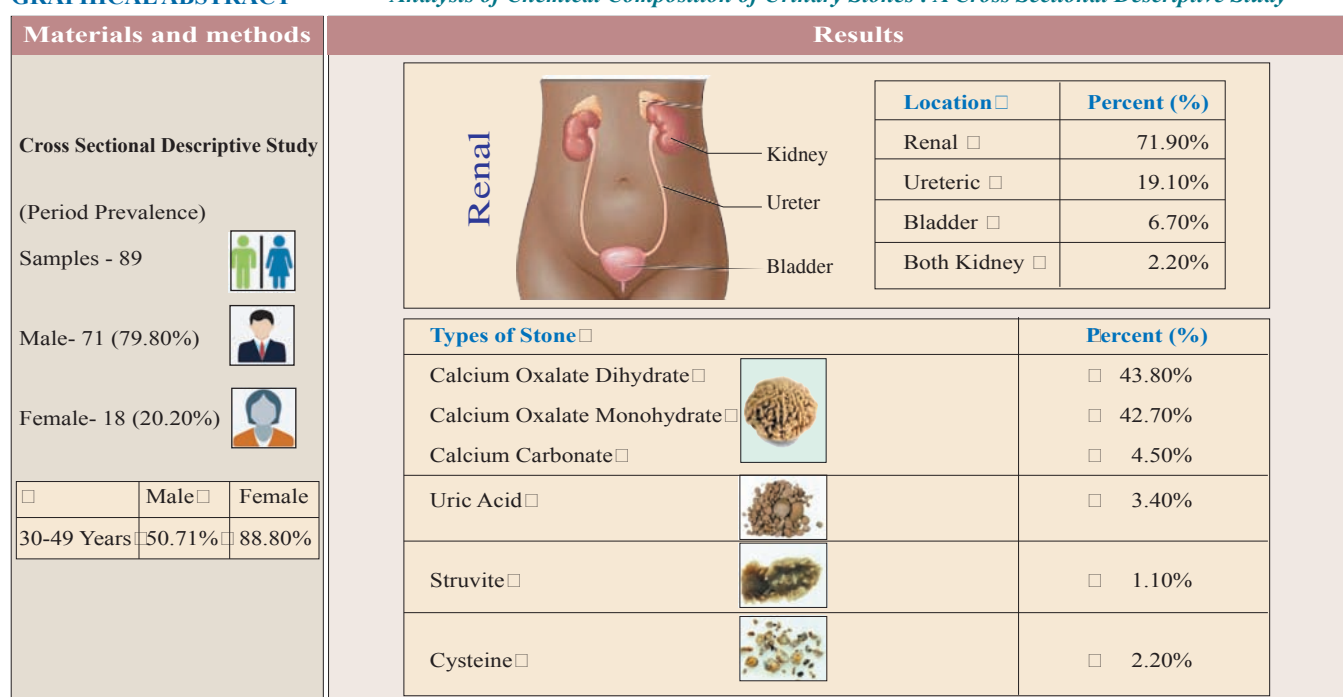
ABSTRACT

Background: Urolithiasis is a relatively common condition in our country. This study was performed with the aim to qualitatively analyze the urinary stones obtained by surgical intervention to evaluate the constituents present in them and to analyze its significance.

Materials and methods: This cross sectional descriptive study was conducted from July to December 2019 at Chattogram International Medical College Hospital, Chittagong Medical College Hospital and some private clinics in Chattogram. Eighty Nine (89) cases were selected on purposive sampling method. Data regarding demography, clinical data and laboratory data was collected and research ethics were maintained throughout the course.

GRAPHICAL ABSTRACT

Analysis of Chemical Composition of Urinary Stones : A Cross Sectional Descriptive Study



Conclusion : Calcium Oxalate is the most frequent composition of urinary stones in all age group.

Meah M H et al.

Ctg Med Uni J. 2022;2(1): 34-38.

- Associate Professor of Urology
Chattogram International Medical College, Chattogram, Bangladesh.
 - Associate Professor of Urology
Chittagong Medical College, Chattogram, Bangladesh.
 - Associate Professor of Surgery
Chattogram International Medical College, Chattogram, Bangladesh.
 - Consultant of Urology
Surgiscope Hospital Pvt Ltd, Chattogram, Bangladesh.
- *Correspondence to: **Dr. Mohamed Hasan Meah**
Cell: +88 01819 31 90 18
Email: drhasanustc@yahoo.com

Submitted on 2nd February 2022
Accepted on 20th February 2022

Results: Highest patient belongs to 30-49 years old group 52.8%. Mean age of the patient was 39.54 years with standard deviation 12.62. Sex ratio revealed that male are much more affected here (Ratio 2.25 to 8.5). Female was affected in 30-49 years as the ratio was 2.25. In this study comorbidity was found hypertension (28.1%), diabetes mellitus (13.5%), and asthma (2.2%). In this study it was found that upper part of renal system mostly affected. This study also assessed the correlation between hyperparathyroidism and formation of renal stone and found that Calcium oxalate dihydrate stone formation significantly correlated with hyper parathyroid state (p-value 0.04).

Conclusion: Calcium oxalate is the most frequent composition of urinary stones in all age groups.

Key word: Chemical analysis; Calcium oxalate; Urolithiasis.

INTRODUCTION

Urolithiasis is a relatively common condition in our country. Urolithiasis, the process of forming stones in the kidney, bladder and urethra is a complex phenomenon yet not clearly understood. Stone forming components such as calcium, magnesium, oxalate, carbonate, phosphate, urate, xanthine, cysteine, etc. Researchers have found evidence of kidney stone in 7,000 year old Egyptian mummy.¹ Each year, worldwide people make almost 3 million visits to health care providers and more than half a million patients go to emergency room with urolithiasis.² Epidemiological studies indicate many factors like age, sex, industrialization, socioeconomic status, diet and environment, influences urolithiasis.³ The prevalence of renal stone formation is approximately 2-3% in the general population.⁴ Alarming high incidence of urolithiasis with varied chemical composition of calculi has been reported from different regions of India.⁵⁻¹¹ Kidney stones are not usually fatal although some primary conditions that produce kidney stones can lead to death from problems associated with primary disease or complications of renal failure. Infected stones may lead to urosepsis and death.¹²

The overall probability of forming stones considerably differs in various parts of the world.^{13,14}

The risk of developing urolithiasis appears to be higher in the western hemisphere than in the eastern hemisphere, even though the highest risks have been reported in some Asian countries.^{14,15}

Continuous changes in lifestyles and dietary habits, the relationships between age and composition can also change with time.¹⁶ Only a few reports to date have suggested a relationship between stone composition and patient's age.¹⁷⁻¹⁹

In 1995, Daudon M, et al reported an increase in the frequency of uric acid stones with an increase in patient's age, they reported that the frequency reaches its peak in the age range 60-70 yr.²⁰ Urolithiasis in developing countries was considered very different from urolithiasis observed in industrialized countries.²¹

There was however no sufficient data on the chemical composition of urinary stones from the population of Chattogram even Bangladesh, thus the present study will be undertaken to qualitatively analyze the renal

stones with the relationship between the sex, age group and location of uroliths in patients of urolithiasis and gather some information in this regard. □ □

MATERIALS AND METHODS

The study was a cross sectional observational study conducted at Chattogram International Medical College Hospital, Chittagong Medical College Hospital and a few Private Clinics in Chattogram. Period of study was 6 months started from July 2019 to December 2019. All the post-operative patients suffering from urinary stone diseases at places of study was the study population. Sample size was 89. Sampling technique was purposive. The study included nearly 89 uroliths obtained by surgical intervention of Urolithiasis patient, those who gave consent and those who had not given consent were excluded.

After evaluation, all the data collected from the study population is being analyzed by using SPSS. Statistical Package for Social Sciences-15 (SPSS Inc. Chicago, IL, USA). All data were evaluated by using statistical methods. The results were presented in tables and figures. The statistical terms used in this study are mean, standard deviation and percentage. Statistical significance was set at $p < 0.05$ and confidence interval set at 95% level.

Ethical clearance had taken from ethical committee of Chattogram International Medical College before starting sample collection.

RESULTS

Table I Age distribution with male female ratio of participants

Age in years □	Male (%) □	Female (%) □	M:F Ratio
<30 □	18 (25.35%) □	5 (27.77%) □	3.6
30-49 □	36 (50.71%) □	16 (88.8%) □	2.25
≥50 □	17 (23.94%) □	2 (11.11%) □	8.5
Total □	71 (100%) □	18 (100%) □	3.94

Table I shows the age distribution with male female ratio. Below 30 years age group the ratio of male and female was 3.6 and among 30-49 years age group it was 2.25. While in ≥50 year's age group the ratio increased to 8.5.

Location of stone: Highest stone was in renal stone. Right renal was 38.2% and left renal stone was 33.7%. After that ureteric stone was high. Left ureteric was 11.2% and right ureteric was 7.9%. Bladder stone was 6.7%. Stone affected both kidney was found in 2.2%.

History of operation: Most patient had no history of operation (89.9%). Few had one, two and five times operations (3.6% each).

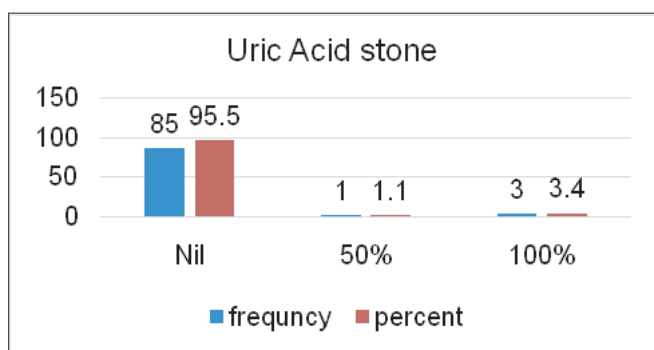


Figure 1 Distribution of Uric acid stone

Figure 1 depicted the distribution uric acid stone among the participants. Only 3.4% population was found a whole uric acid stone while 1.1% population had mixed uric acid stone.

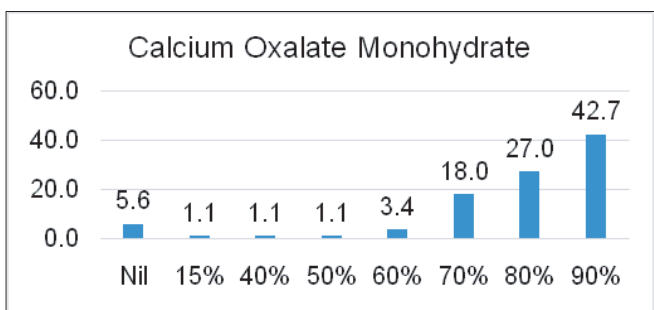


Figure 2 Calcium Oxalate Monohydrate distribution

Calcium oxalate monohydrate stone was one of the most prevalent stones among the participants (Figure 2). Around 42.7% population had calcium oxalate monohydrate stone consisting 90% of the total stone chemical composition followed by 27% had 80% composition and 18% had 70% chemical composition. Few had (3.4%) stone composition of 60%.

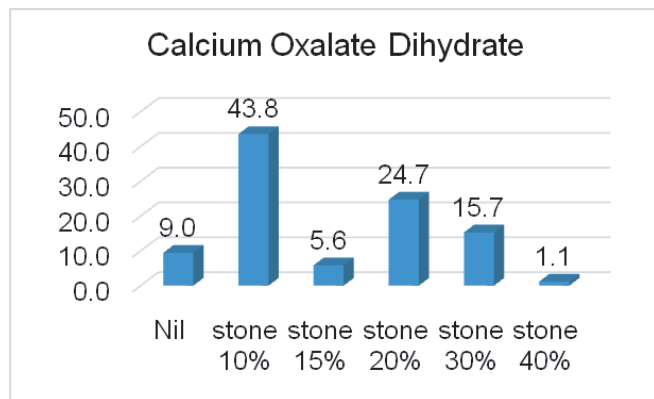


Figure 3 Distribution of calcium oxalate dihydrate stone

Figure 3 illustrates the distribution of calcium oxalate dihydrate showing 43.8% patient had 10% stone chemical composition. Another 24.7%, 15.7% and 5.6% patient had 20%, 30% and 15% stone composition respectively.

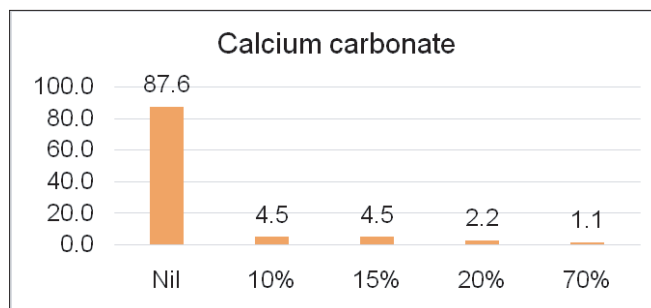


Figure 4 Distribution of Calcium carbonate stone

Figure 4 reveals the distribution of calcium carbonate stone present in the patient. Only 4.5% patient had this stone as 10% of total chemical of renal stone followed by another 4.5% had 15% of the same and 2.5% had 20% stone composed of calcium carbonate.

Location of different stones according to their location: Oxalate stone was high in all region. It was 70.8% in renal region, 19.1% in Ureteric region and 5.6% in vesicle region. Uric acid stone was high in renal region (3.4%) followed by vesicle region (1.1). Similarly Calcium carbonate stone was high in renal region (9%) followed by vesicle region (2.2%). Struvite and cysteine was found only in renal region (1.1% and 2.2% respectively).

Association between renal stone and hyperparathyroidism: It shows that hyperparathyroidism is significantly associated with calcium oxalate dihydrate stone formation (p-value 0.04). Other stones was not correlated with hyperparathyroidism.

DISCUSSION

Mean age of the patient was 39.54 years with standard deviation 12.62. Among the 89 participant 79.8% was male and 20.2% was female. Sex ratio revealed that male are much more affected here (ratio 2.25 to 8.5). Female was affected more in 30-49 years as the ratio was 2.25. Below 30 years age group the ratio of male and female was 3.6 and while in ≥50 year’s age group the ratio increased to 8.5. On the other hand younger and older male had more propensity to have renal stone than female. The age group was similar in Tunisian study, most people in the age group in 40-49 years although the male female ratio was less in Tunisian study.²² In another study of India, higher frequency of stone found in the middle age group that corresponds with current study.²³

In this study it was found that upper part of renal system mostly affected. Highest stone was renal stone. Right renal stone was 38.2% and left renal stone was 33.7%. After that ureteric stone was high. Left ureteric was 11.2% and right ureteric was 7.9%. Bladder stone was 6.7%. Stone was found in 2.2%. Among Lower urinary tract stone, ureteric stone was decreased with age and vesicle stone increased with age in present study. But in Tunisian study it was found that lower urinary tract stone was higher in extreme of age²².

Current study found that most common stone in all region is oxalate stone followed by calcium carbonate and uric acid. Calcium oxalate monohydrate stone was one of the most prevalent stones among the participants (Figure 2). Around 42.7% population had calcium oxalate monohydrate stone consisting 90% of the total stone chemical composition followed by 27% had 80% composition and 18% had 70% chemical composition. Few had (3.4%) stone composition of 60%. Similar result was found in the study of in respect of oxalate stone (Whewellite and Weddellite) but uric acid stone was higher than calcium carbonate (Carbapatite and Calcite) in that study.²³ Other study represents higher oxalate stone like this study²⁴. According to some previous study calcium oxalate stones in developing countries are mainly observed in North Africa and Asia Minor. In our study, calcium oxalate stones were found in 42.7 % (Figure 2) of all cases. This rate is comparable to those reported in French, Brazilian and Spanish papers.

This study also assessed the correlation between hyperparathyroidism and formation of renal stone and found that Calcium oxalate dihydrate stone formation is significantly correlated with hyper parathyroid state (p-value 0.04).²⁵

LIMITATION

This study had limitation of small sample size, cross sectional design and limited investigation was performed.

CONCLUSION

Calcium oxalate is the most frequent composition of urinary stones in all age groups.

RECOMMENDATION

Further studies are needed to evaluate the causes of formation of urinary stones to decrease the incidence, prevalence and recurrences of urinary stone disease.

ACKNOWLEDGEMENT

We acknowledge the Vice Chancellor of Chittagong Medical University, Chattogram, Chattogram International Medical College authority. We thank the doctors and technical staff of the Department of Surgery and Urology, CIMCH.

CONTRIBUTION OF AUTHORS

MHM-Conception, acquisition of data, data analysis, drafting & final approval.

MMH – Design, Interpretation of data, critical revision & final approval.

MMR-Acquisition of data, drafting & final approval.

AMM-Data analysis, interpretation of data, critical revision & final approval.

DISCLOSURE

- Unimed and Unihealth Mfg. Ltd (For providing the □
□ financial support.
- Chittagong Medical University, Chattogram (For □
□ partial fund).

REFERENCES

1. Prien E L, Frondal C. Studies in urolithiasis. The composition of urinary calculi. *J Urol.* 1947; 57: 549-556.
2. Boyce W H, Garvey F K , Straw H G. Incidence of urinary calculi among patients in General Hospitals, 1948 to 1952. *J Am Med Assoc.* 1956; 161: 1437-1442.
3. Herring L C. Studies on urinary calculi. *J Urol.* 1962; 88: 545-562.
4. Anderson DA. A survey of incidence of urolithiasis in Norway from 1853 to 1960. *J Oslo. City Hospital.* 1966; 16: 101-147.
5. Newcomb C, Ranganathan S. The composition of urinary calculi. *Indian J Med Sci.* 1930; 17:1037.
6. Parikh H S, Shah R C .Chemical composition of urinary calculi. *Indian J Med Sci.* 1960; 14: 401-405.
7. Rao B K,Gupta H N,Rangnekar C V. Chemical composition of urinary calculi *J Indian Med Assoc.* 1964; 13:469-473.
8. Thind SK, Nath R. Chemical analysis of urinary calculi in Chandigarh area. *Indian J Med Res.* 1969; 57: 1790.
9. Kabra SG, Gaur SB, Sharma SS, Patni MK, Benerji P. Urolithiasis incidence of urinary calculi in South- Eastern Rajasthan- Report of 1144 cases. *Indian J Surg.* 1972; 34: 309.
10. Ansari MS, Gupta NP, Hemal AK, Dogra PN, Seth A, Aron M, Singh TP. Spectrum of stone composition: Structural analysis of 1050 upper urinary tract calculi from Northern India. *Int J Urol.* 2005; 12: 12-16.
11. Malhotra KK, Ahuja MS, Singh SM and Baphna BC. Correlative study of urinary calculus disease. *Ind J Med Sci.* 1968; 23: 380.
12. Halstead SB, Valyasevi A, Umpaivit P. Studies on bladder stone disease in Thailand V. Dietary habits and disease prevalence. *Am J ClinNutr.* 1967; 20: 1352.
13. Trinchieri A. Epidemiology of urolithiasis. *Arch ItalUrolAndrol.* 1996;68: 203-249.
14. Ramello A, Vitale C, Marangella M. Epidemiology of nephrolithiasis. *J Nephrol.* 2000;S(3):S45-50.
15. Robertson WG and Hughes H. Epidemiology of urinary stone disease in Saudi Arabia. In: Ryall R, Bais R, et al. eds. *Urolithiasis 2.* New York London: Plenum Press. 1994:453-455.
16. Costa-Bauzá A, Ramis M, Montesinos V, Grases F, Conte A, Pizá P, et al. Type of renal calculi: Variation with age and sex. *World J Urol.* 2007; 25:415-421.
17. Alaya A, Najjar MF, Nouri A. Changes in stone composition according to age in Tunisian pediatric patients. *IntUrolNephrol.* 2010; 42:621-628.
18. Daudon M, Doré JC, Jungers P, Lacour B. Changes in stone composition according to age and gender of patients: A multivariate epidemiological approach. *Urol Res.* 2004;32:241-247.
19. Koide T, Itatani H, Yoshioka T, Ito H, Namiki M, Nakano E et al. Clinical manifestations of calcium oxalate monohydrate and dihydrate urolithiasis. *J Urol.* 1982; 127:1067-1069.
20. Daudon M, Donsimoni R, Hennequin C, Fellahi S, Le Moel G, Paris M, et al. Sex- and age-related composition of 10 617 calculi analyzed by infrared spectroscopy. *Urol Res.* 1995; 23:319-326.
21. López M and Hoppe B. History, epidemiology and regional diversities of urolithiasis. 2010.
22. Alaya A, Nouri A, Belgith M, Saad H, Jouini R, Najjar MF. Changes in urinary stone composition in the Tunisian population: A retrospective study of 1,301 cases. *AnnLab Med.* 2012; 32:177-1783.
23. Durgawale, P., Shariff, A., Hendre, A., Patil, S., & Sontakke, A. Chemical analysis of stones and its significance in urolithiasis. *Biomedical Research.* 2010;21(3): 305–310.
24. Hodgkinson, A., & Infirmery, G. A combined qualitative and quantitative procedure for the chemical analysis of urinary calculi. *Journal of Clinical Pathology.* 1971;24:147–151.
25. Lila, A. R., Sarathi, V., Jagrap, V., Bandgar, T., Menon, P. S., & Shah, N. S. Renal manifestation of primary hyperparathyroidism anurag ranjan. *Indian Journal of Endocrinological Metabolism.* 2012;16(2), 258–262.

Prevalence and Clinical Pattern of “Discharging Ear” in the ENT Out Patient Department of a Non-government Medical College Hospital
















Maleka Afroz^{1*} M. Zubair Hussain² Mohammed Parvez Iqbal Sharif³ Mohammad Shahed Ali Khan⁴ Md Anoarur Rahman⁵

ABSTRACT

Background: Discharging Ear (DE) is quite a common presentation in any primary care set up and failure to address it properly affects the quality of life of the victim. It always cause some degree of hearing impairment and may be associated with grave complication due to close relation of the ear to VII nerve and brain. It can present in several patterns. Middle ear infection is the commonest. The aim of study was to find out the prevalence of DE and its clinical patterns in ENT Out Patient Department of a non government Medical College Hospital.

Prevalence and Clinical Pattern of 'Discharging Ear' in the ENT Outpatient Department of a Non-government Medical College Hospital

GRAPHICAL ABSTRACT

Materials and methods	Results	
Cross Sectional Observational Study	Type of Discharging Ear Diseases <input type="checkbox"/>	Percentage (%)
Total Population in ENT Ward - 400	CSOM Safe Variety <input type="checkbox"/>	46.39%
 <input type="checkbox"/> Ear Disease <input type="checkbox"/> - 202		
<input type="checkbox"/> Other ENT Disease <input type="checkbox"/> - 198	ASOM Post Perforation <input type="checkbox"/>	15.47%
Out of Ear Disease (202)		
 <input type="checkbox"/> Discharging Ear disease <input type="checkbox"/> - 97	Diffuse Otitis Externa <input type="checkbox"/>	13.41%
<input type="checkbox"/> Other Ear disease <input type="checkbox"/> - 105		
Discharging Ear disease	Infected Waxy Debris <input type="checkbox"/>	11.34%
 <input type="checkbox"/> Male <input type="checkbox"/> - 40 <input type="checkbox"/> p-value .000		
 <input type="checkbox"/> Female <input type="checkbox"/> - 57	Foreign Body Infection <input type="checkbox"/>	3.09%
Age Pattern		
 <input type="checkbox"/> Below 30 years <input type="checkbox"/> - 66	Bleeding with Traumatic Rupture of TM <input type="checkbox"/>	3.09%
 <input type="checkbox"/> Above 30 Years <input type="checkbox"/> - 31		
	CSOM Unsafe Variety <input type="checkbox"/>	2.06%
		
	Otomycosis <input type="checkbox"/>	4.12%
		
	Furunculosis <input type="checkbox"/>	1.03%
		

Conclusion : All most half of the discharging Ear is of CSOM safe variety, so proper identification is required to avoid blind treatment.

Afroz M et al.

Ctg Med Uni J. 2022;2(1): 39-43.

- Associate Professor of Otolaryngology-Head & Neck Surgery
 Chattagram International Medical College, Chattogram, Bangladesh.
- Professor of Otolaryngology-Head & Neck Surgery,
 Chattagram International Medical College, Chattogram, Bangladesh.
- Associate Professor of Community Medicine
 Chattagram International Medical College, Chattogram, Bangladesh.
- Assistant Professor of Otolaryngology-Head & Neck Surgery
 Chattagram International Medical College, Chattogram, Bangladesh.
- Assistant Registrar of Otolaryngology-Head & Neck Surgery
 Chattagram International Medical College Hospital, Chattogram, Bangladesh.

*Correspondence to: Dr. Maleka Afroz

Cell: +88 01715 08 01 75
 Email: dr.maleka@yahoo.com

Submitted on 8th February 2022

Accepted on 28th February 2022

Materials and methods: This cross-sectional observational study, carried out at the ENT Out Patient Department of Chattagram International Medical College Hospital (CIMCH) by non purposive Sampling. Information's were collected in a CRF while taking a detailed history and thorough clinical examination. In majority of cases a clinical diagnosis was reached on the day of visit. In cases where a definite clinical diagnosis of DE could not be established or the patient failed to attend at a next date required to confirm the clinical pattern were excluded from the study.

Results: Among 400 patients prevalence of Ear disease was 202(50.50%), out of which 97(24.25%) emerged as DE. CSOM (Chronic Suppurative Otitis Media) safe variety 45(46.39%) was detected as commonest clinical pattern of discharging ear followed by ASOM (Acute Suppurative Otitis

Media) post perforation 15(15.47%) and Diffuse otitis externa 13(13.41%).

Conclusion: All most half of the discharging Ear is of CSOM safe variety, so proper identification is required to avoid blind treatment.

Key words: Clinical pattern; Discharging ear; Prevalence.

INTRODUCTION

The magnitude of health problem that develops with discharging ear has never been estimated in a larger scale and very little interest is shown about the prevalence and clinical pattern of discharging ear. In the literature review lot of studies are seen showing microbiological pattern and socio-demographic studies of CSOM but studies to analyze the clinical pattern of discharging ear, the way it affects the quality of life and its potential risks is well-thought-out very seldom. Discharging ear is the principal presenting symptom of middle and external ear diseases and commonest reason for patients to meet their GP or local doctors.^{1,2} Commonest cause of discharging ear in developing countries is CSOM, mucosal type.^{2,3} Bangladesh has a population of 15 million and high incidence of chronic otitis media in Bangladesh has been found linked with overcrowding, inadequate housing, poor hygiene, lack of breast feeding, poor nutrition, passive smoking, frequent upper respiratory tract infection etc.⁴ If DE is left untreated there is not only damage of the hearing; but also risk of development of serious complication due to its close relation to base of the skull, VII nerve and brain.

The middle ear diseases that can cause discharging ear generally are CSOM mucosal type, CSOM squamous type, ASOM, Traumatic rupture of tympanic membrane and myringitis bullosa. Commonest external ear disease that cause discharging ear is diffuse Otitis externa. Others are furunculosis, malignant Otitis externa, trauma, Otomycosis, infected waxy debris and foreign body. The only inner ear disorder that may present with discharging ear is head injury with fracture of temporal bone.

The general treatment is simple. However proper enquiry about the acute ness and severity, proper examination of ear canal and suction clearance are essential under close observation of an ENT physician to minimize the sufferings of the patient and prevent spread of infection. The aim of study was to find out the prevalence of DE and its clinical patterns in ENT Out Patient Department of a Non-government Medical College Hospital.

MATERIALS AND METHODS

This cross sectional observational study carried out in Chattagram International Medical College Hospital (CIMCH). Altogether 400 Patients visiting the ENT Out Patient Department during the Month of April 2019 to June 2019, selected by non purposive sampling, are taken as study population.

Inclusion criteria: All patients presented with DE were included in the study.

Exclusion criteria: In case a definite clinical diagnosis of DE could not be established or patients failed to attend at a next date if required to reach a confirmed clinical diagnosis were excluded from the study.

Data were collected in a preplanned CRF through history taking and thorough examination of ENT- Head and Neck region. All the collected data were analyzed, compiled and tabulated. Statistical analysis was done by SPSS version-20. The results were presented in tables, charts, figures. The research proposal was approved by Ethical Committee and Review Board of Chattagram International Medical College.

RESULTS

Out of 400 patient prevalence of Ear disease was seen highest 202(50.50%) (Figure 1) followed by Throat disease 108(27.00%), Nasal disease 60(15.00%), Neck disease 18(04.50%), Nose and Throat disease 09(02.25%) and Throat and Neck disease 03(00.75%). Those who presented with ear diseases DE was detected in 97(24.25%) cases and ear diseases without discharge in 105(26.25%) cases. DE of middle ear origin 65(67.01%) was seen almost double to external ear origin 32(32.99%).

In this study (Table I) female patient was seen to dominate over male. Out of 97 cases of DE female patient was seen 57(58.76%) and male patient 40(41.24%). Statistical analysis shows $\chi^2 = 47.77$ and p value 0.000 which is highly significant. Study of age pattern (Table- II) shows highest prevalence in 0-10 age group 24(24.74%) followed by 11-20 age group 23(23.71%), 21-30 age group 19(19.59%), 31-40 age group in 14(14.44%), 41-50 age group 10(10.31%), 51-60 age group 04(04.12%) and 61-70 group 03(03.09%) respectively. Mean age \pm SD was 23.94 \pm 16.55. The prevalence was seen to lower gradually with increase of age. Population pyramid (Figure 2) made with male and female pattern according to age shows most vulnerable male age group of developing DE is 0-10 years and female age group is 11-20 years followed by gradual reduction of prevalence of DE with increasing age.

Variable clinical patterns were observed in DE (Figure 2). CSOM safe variety 45(46.39%) was detected highest followed by ASOM post perforation 15(15.47%), Diffuse Otitis Externa 13(13.41%), Infected waxy debris 11(11.34%), Otomycosis 04(4.12%), Infected foreign body 03(3.09%), Bleeding with traumatic Rupture of Tm 03(3.09%), CSOM unsafe variety 02(02.06%) and Furunculosis 01(1.03%). The incidence of DE with red flag sign was observed in only 02(02.06%) cases.

DE is always associated with some degree of hearing loss which becomes long standing if there is perforation in the tympanic membrane. Out of 97 cases of DE 65 (67.01%) cases were seen with perforation in the tympanic membrane and 32(32.99%) cases with normal tympanic membrane.

Table I Gender pattern of discharging ear

Gender	No. of Cases	Test Statistic	p value
Male	40(41.24%)		0.000 (Highly significant)
Female	57(58.76%)	$\chi^2 = 47.77$	
Total	97(100%)		

* Chi Square test was done to measure the level of significance.

* Figure within parentheses indicates in percentage.

Table II Age pattern of discharging ear

Age Group (Years)	No. of Cases	Mean ± SD
0-10	24(24.74%)	
11-20	23(23.71%)	
21-30	19(19.59%)	
31-40	14(14.44%)	23.94 ± 16.55
41-50	10(10.31%)	
51-60	04(04.12%)	
61-70	03(03.09%)	
Total	97(100%)	

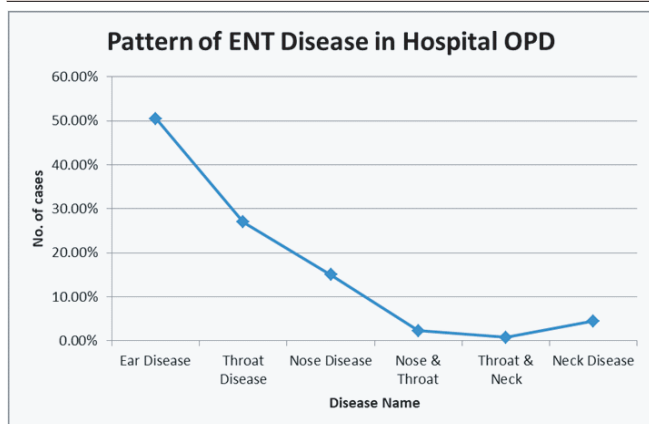


Figure 1 Clinical pattern of ENT disease in hospital OPD

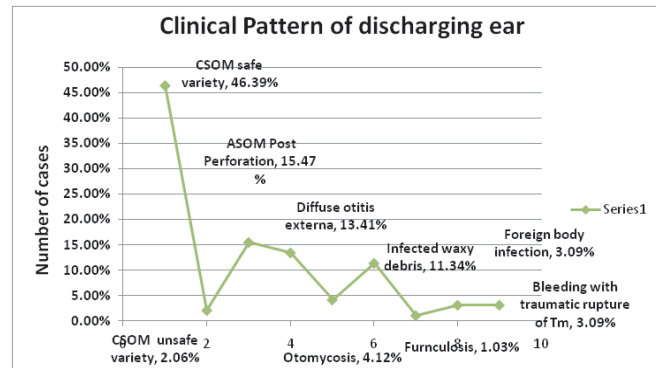


Figure 2 Clinical pattern of discharging ear

DISCUSSION

A total of 400 patients visiting the ENT Outpatient Department of CIMCH were examined for the study. The prevalence of ear disease 202(50.50%) was found highest followed by throat 108(27.00%), Nasal 60(15.00%) & Neck disease 18(4.5%) (Table I and Figure 1). A study carried out in BIRDEM Hospital depicts the same clinical scenario. Ear disease shows the highest prevalence (41.1%) in the study followed by that of throat (31.7%) and nose (17.1%).⁵ Another study carried out in a GOVT District Hospital, Jammu and Kashmir, India amongst paediatric population shows similar pattern of ENT disorders, where maximum children are seen suffered from ear disorders (49.32%) followed by throat (34.55%) and nose disorders (16.14%).⁶ A retrospective study conducted at Al Sharq Medical Centre in Fujairah, United Arab Emirates (UAE) among 625 children having ENT problems diseases of the ear were found highest 314 (50.24%).⁷ An audit carried out aimed at determining the pattern of ear, nose and throat diseases and their relationship with socio-demographic factors in South-western Nigeria from Medical records of patients managed at the Department of Otorhinolaryngology, University College Hospital, Ibadan, Nigeria reviewing all essential clinical data shows patients with ear, nose, throat and head/neck diseases 3136 (62.7%), 1153 (23.0%), 479 (9.6%), 233 (4.7%) respectively.⁸

Among the different clinical pattern of discharging ear (n=97) CSOM safe variety 45(46.39%) was seen highest in our study followed by ASOM post perforation 15(15.47%) and Diffuse otitis externa 13(13.41%) (Figure 2) This is supported by most of the studies with CSOM. Suppurative otitis media (ASOM and CSOM) is the most common Ear disease constituting one-fourth of all registered cases in the study carried out in BIRDEM Hospital, Dhaka.⁵

CSOM is found the commonest ENT disorder carried out in the GOVT District Hospital, Jammu and Kashmir, India among paediatric population.⁶ Prevalence of CSOM in developing countries represents a wide range 4% to 33.3%.⁹ Majed MA. has found CSOM 15.06% patient in a study in Dhaka Medical College Hospital in 1977.¹⁰ Amin et al found CSOM 18.46% to 35.58% in four rural ENT camps.¹¹ CSOM was found in Rangpur Medical College Hospital 31.25%.¹² Thakur et al. has shown high incidence of otitis media (17.3%) and Zakzouk and al-Mohaimed also showed similar high incidence of otitis media in their study (19.6%). The department of community medicine in All Indian Institute of Medical Science revealed CSOM in 15.3% of rural child.¹³ In a number of studies however it coincides with our study. In our study CSOM was recorded 11.75% (n=400). In BIRDEM hospital and in the district level hospital of Jammu-Kashmir it is seen respectively 12.2% and 13.29%.^{5,6} In a study carried out by Biswas AC et al. on Prevalence of CSOM among rural school going children the prevalence is seen 12.44%.¹⁴

Strikingly more surprising trend of middle ear infection which was noted in this study was lowered incidence of unsafe variety of CSOM 2(2.06%) in comparison to the other studies (Figure 2). Study on prevalence of CSOM in Gopalganj, Bangladesh shows 180 (90%) safe variety of CSOM and 20(10%) unsafe variety.¹³ The reduced referral of unsafe variety (About 48%) of CSOM to Finnish university hospital was also seen in a study with 1123 patients with chronic otitis for surgical treatment over a 20-year period.¹⁵ In our region this dramatically declined incidence of unsafe variety of CSOM might be due to eccentric position of our hospital, increasing no of doctors, more availability of primary health care service, development of more public awareness and easy access to antimicrobial chemotherapy.

Female population 57(58.76%) was seen more sufferers of DE than the male 40 (41.24%) in our study (Table I).

LIMITATION

- As the study was conducted in only one hospital it may not represent the whole population of Chattogram city.

- CIMCH is a non-government hospital situated slightly away from the center of the metropolitan city of Chattogram. So, Clinical Pattern of Discharging ear diseases presented in this hospital and in this part of the city may differ from the presentation in government hospital or district hospital.

CONCLUSION

All most half of the discharging Ear is of CSOM safe variety, so proper identification is required to avoid blind treatment.

RECOMMENDATION

Multicenter study may be conducted to find the real scenario of the populations.

ACKNOWLEDGEMENT

We are very much grateful to Directors, Principal and all the associates of the Department of ENT, CIMCH for their support in the research activity.

CONTRIBUTION OF AUTHORS

MA-Conception, acquisition of data, data analysis, drafting & final approval.

MZH-Interpretation of data, critical revision & final approval.

MPIS-Design, analysis of data, critical revision & final approval.

MSAK-Interpretation of data, critical revision & final approval.

MAR- Data analysis, drafting & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. Joshi RR. Spectrum of otolaryngological disease in Remote Rural Western Nepal. *Nepal Med Coll J.* 2016; 18 (1-2): 86-89.
2. Dr. Steve Brown . Discharging Ear Whats the diagnosis?.
<http://www.guidelinesinpractice.co.uk>352901.article>
3. Shrestha BL et al. Comparison of clinical presentation between CSOM mucosal with Squamous. *Kathmandu Uni Med J. (KUMJ).* 2010;8(32):387-391.
4. Md. Mazharul Shaheen, Ahmed Raquib, Shaikh Muniruddin Ahmad. Chronic Suppurative Otitis Media and Its Association with Socio-Economic Factors Among Rural Primary School Children of Bangladesh. *Indian J Otolaryngol Head Neck Surg.* 2012; 64(1): 36–41.
5. Badhan KD, Anamika D, Mir M R, M A Sayeed. Pattern of ear nose and throat diaseses in a tertiary hospital of Dhaka city. *IMC Journal of Medical Science.* 2018;12(1), 22-26.
<https://doi.org/10.3329/imcjms.v12i1.35173>.
6. Gupta V et al. *Int J Otorhinolaryngol Head Neck Surg.* 2019;5(2):403-407.
<http://www.ijorl.com>.
7. Sumanyeli. Prevalence of ENT disorders among children in UAE: A tertiary medical care Study. *Int. J. Curr. Microbiol. App. Sci.* 2015; 4(7): 682-687.
<http://www.ijemas.com>
8. Ayotunde JF, Musa S, Onyekwere G N. An audit of Ear, Nose and Throat diseases in a tertiary health institution in Southwestern Nigeria. *Pan African Medical Journal.* 2013; 14:1.
doi: 10.11604/pamj.2013.14.1.1092.
<http://www.panafrican-med-journal.com/content/article/14/1/full/>.
9. Rupav, Jacob A, JosepA. ‘Chronic Suppurative Otitis Media: Prevalence and practice among rural South Indian Children. *International Journal Paediatric Otorhinolaryngology.* 1999; 48:217-221.
10. Majed MA. ENT problems in Bangladesh. *Bangladesh Med. J.* 1979; 8: 55- 59.
11. Datta PG, Newton VE, Amin etal. Chronic Suppurative Otitis Media – A major cause of hearing impairment in developing countries. *J. Bangladesh CollPhys Surg.* 1995; 13: 24-27.
12. Haque GHMS, Joarder AH, Amin ASA, Islam MA, Ahsan MZ, Akaiduzzaman DGM. Pattern of ENT diseases: An outpatient based study in Rangpur Medical College Hospital. *Northern Med J.* 1996; 5: 52- 5.
13. Sirajul I, Kabir A, Zahurul H, Allam C, Ahmmad T, Mozaharul I. Prevalence of Chronic Suppurative Otitis Media in Out Patient Department (OPD) in a District Level 250 Bedded General Hospital, Gopalganj, Bangladesh: *Bangladesh J Otorhinolaryngol.* 2016; 22(2): 102-109.
14. Biswas AC, Joardar AH, Siddique BH. Prevalence of Chronic Suppurative Otitis Media among rural school going children. *Mymensingh Medical Journal.* 1995; 14: 152-155.
15. Euro Vartiainen MD. Changes in the clinical presentation of Chronic Otitis Media From 1970s to the 1990s. *The Journal of Laryngology and Otology.* 1998; 112: 1034-1037.

Polypharmacy, Drug Adherence and Multimorbidity in Geriatric Patients




































Bidduth Barua^{1*} Mukesh Kumar Dutta² Ishtiakul Islam Khan³

ABSTRACT

Background: Geriatric people are one of the most rapidly growing age groups globally. Simultaneous use of multiple drugs (Polypharmacy) has been associated with adverse drug reactions, medication errors, and non-adherence to prescribe medicines. This study aimed to investigate the prevalence of polypharmacy and assess drug adherence and multimorbidity among geriatric patients attending the Medicine Outpatient Department of a tertiary hospital in Bangladesh.

GRAPHICAL ABSTRACT

Polypharmacy Drug Adherence and Multimorbidity in Geriatric Patients

Materials and methods	Results																																		
<p>Cross Sectional Observational Study</p> <p>Samples - 200 </p> <p>< 65 years - 90 </p> <p>> 65 years - 110 </p> <p>Male - 124 </p> <p>Female - 76 </p> <p>Prevalence of Polypharmacy - 56% </p> <p><input type="checkbox"/> Adherence to drug - 46 (41.1%) </p> <p><input type="checkbox"/> No Adherence to drug - 66 (58.9%) </p> <p>p value: 0.025</p>	<p>Proportion of polypharmacy according to socio demographic variable</p> <table border="1"> <thead> <tr> <th>Variable <input type="checkbox"/></th> <th>Polypharmacy <input type="checkbox"/></th> <th>p value</th> </tr> </thead> <tbody> <tr> <td>Male - 72 <input type="checkbox"/> </td> <td>58.1%</td> <td rowspan="2">0.595</td> </tr> <tr> <td>Female - 40 <input type="checkbox"/> </td> <td>52.6%</td> </tr> <tr> <td>Age Pattern</td> <td></td> <td rowspan="2">0.067</td> </tr> <tr> <td><65 Years (90) </td> <td>44 (45.9)</td> </tr> <tr> <td>>65 Years (110) <input type="checkbox"/> </td> <td>68 (61.9)</td> <td></td> </tr> </tbody> </table> <p>Comorbidity associated with polypharmacy</p> <table border="1"> <thead> <tr> <th>Comorbidity <input type="checkbox"/></th> <th>Number <input type="checkbox"/></th> <th>Polypharmacy</th> </tr> </thead> <tbody> <tr> <td>DM <input type="checkbox"/> </td> <td>40/50 <input type="checkbox"/></td> <td>80%</td> </tr> <tr> <td>HTN <input type="checkbox"/> </td> <td>38/74 <input type="checkbox"/></td> <td>67.9%</td> </tr> <tr> <td>COPD <input type="checkbox"/> </td> <td>60/86 <input type="checkbox"/></td> <td>69.8%</td> </tr> <tr> <td>OA <input type="checkbox"/> </td> <td>4/20 <input type="checkbox"/></td> <td>20%</td> </tr> <tr> <td>CKD <input type="checkbox"/> </td> <td>12/12 <input type="checkbox"/></td> <td>100%</td> </tr> </tbody> </table>	Variable <input type="checkbox"/>	Polypharmacy <input type="checkbox"/>	p value	Male - 72 <input type="checkbox"/> 	58.1%	0.595	Female - 40 <input type="checkbox"/> 	52.6%	Age Pattern		0.067	<65 Years (90) 	44 (45.9)	>65 Years (110) <input type="checkbox"/> 	68 (61.9)		Comorbidity <input type="checkbox"/>	Number <input type="checkbox"/>	Polypharmacy	DM <input type="checkbox"/> 	40/50 <input type="checkbox"/>	80%	HTN <input type="checkbox"/> 	38/74 <input type="checkbox"/>	67.9%	COPD <input type="checkbox"/> 	60/86 <input type="checkbox"/>	69.8%	OA <input type="checkbox"/> 	4/20 <input type="checkbox"/>	20%	CKD <input type="checkbox"/> 	12/12 <input type="checkbox"/>	100%
Variable <input type="checkbox"/>	Polypharmacy <input type="checkbox"/>	p value																																	
Male - 72 <input type="checkbox"/> 	58.1%	0.595																																	
Female - 40 <input type="checkbox"/> 	52.6%																																		
Age Pattern		0.067																																	
<65 Years (90) 	44 (45.9)																																		
>65 Years (110) <input type="checkbox"/> 	68 (61.9)																																		
Comorbidity <input type="checkbox"/>	Number <input type="checkbox"/>	Polypharmacy																																	
DM <input type="checkbox"/> 	40/50 <input type="checkbox"/>	80%																																	
HTN <input type="checkbox"/> 	38/74 <input type="checkbox"/>	67.9%																																	
COPD <input type="checkbox"/> 	60/86 <input type="checkbox"/>	69.8%																																	
OA <input type="checkbox"/> 	4/20 <input type="checkbox"/>	20%																																	
CKD <input type="checkbox"/> 	12/12 <input type="checkbox"/>	100%																																	

Conclusion : Polypharmacy was high in the population. About half of the patients were adherence to their prescribe drug. Most of the patients were suffering from various co-morbidity conditions. All CKD patients used polypharmacy.

Barua B et al.

Ctg Med Uni J. 2022;2(1): 44-49.

- Deputy Director
 Chittagong Medical University, Chattogram, Bangladesh.
- Assistant Professor (CC) of Community Medicine
 Chittagong Medical College, Chattogram, Bangladesh.
- Medical Officer
 icddr, Dhaka, Bangladesh.

*Correspondence to: Dr. Bidduth Barua

Cell: +88 01309 03 41 00

Email: drbbaruabd@gmail.com

Submitted on 10th March 2022

Accepted on 27th March 2022

Materials and methods: In this cross-sectional observational study, 200 patients aged more than 60 years attended the Medicine Outpatient Department of Bangladesh Institute of Tropical and Infectious Diseases (BITID) Hospital were included. A structured case record form collected data, and drug adherence were measured by Morisky Medication Adherence Scale-8 (MMAS-8). Data were analyzed by SPSS-23.

Results: The average age of individuals was 65.56 ± 6.9 years, and 62% were male. Among the investigated individuals, the prevalence of polypharmacy was 56%, 52.6% in women and 58.1% in men. Eighty-eight (49%) patients

were not adherent to their drugs. Patients with polypharmacy were more likely to be non-adherent [odds ratio (OR): 2.5, 95% confidence interval (CI): 1.1-5.7, $p=0.025$] than the elderly patients without polypharmacy.

Conclusion: Polypharmacy was high in the population. About half of the patients were adherence to their prescribe drug. Most of the patients were suffering from various co-morbidity conditions. CKD patients centpercent (100%) had using polypharmacy.

Key words: Chronic health conditions; Elderly; Polypharmacy; Non-adherence.

INTRODUCTION

Multimorbidity, the coexistence of two or more chronic conditions, has become widely prevalent through the third phase of the epidemiologic transition, characterized by a decline in mortality rates combined with an aging population.¹ Over the last 20-30 years, problems related to aging, multimorbidity, and polypharmacy have become a prominent issue in global healthcare.² Increase in the number of older adults and the incidence of chronic disease are linked to polypharmacy which is defined by the WHO as the administration of multiple drugs concurrently or an excessive number of drugs.³

Some data suggest that polypharmacy is associated with a decline in physical and instrumental activities of daily living even after controlling for multiple comorbidities.⁴ Polypharmacy is also related to negative consequences, such as increased mortality risk.⁵ In addition, polypharmacy increases medical costs.⁶ It has been shown that polypharmacy positively correlates with an increased risk for Adverse Drug Reactions (ADRs) and drug-drug and drug-disease interactions. On the other hand, polypharmacy can increase the risk of medication non-adherence, which can cause suboptimal therapeutic effectiveness and poor clinical response.⁷

Only limited data have been available regarding polypharmacy-associated health problems among geriatric patients in Bangladesh. So, this study was conducted to gather knowledge of the nature and extent of polypharmacy in geriatric patients and assess the frequency of drug adherence to identify and raise awareness of significant adverse health outcomes associated with polypharmacy. Moreover, this would contribute to the literature on providing appropriate senior health care facilities in Bangladesh. This study aimed to investigate the prevalence of polypharmacy and assess drug adherence and multimorbidity among geriatric patients attending the Medicine Outpatient Department of a tertiary hospital in Bangladesh.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Medicine Outpatient Department of Bangladesh Institute of Tropical and Infectious Diseases (BITID) Hospital, Chattogram, Bangladesh, from October 2021 to February 2022. The study was performed following approval from the institutional Ethical Review Committee and eligible patients were recruited after having signed an informed consent, which clearly stated that it was a research study being conducted and that their information was kept confidential and may be published.

Patients attending in medicine OPD age 60 years and above who were able to self-report their consumed medications and/or having prescriptions and/or drug samples available were included in the study. Severely ill patients and subjects who did not provide written consent to participate in the study were excluded.

A structured case record form was used to collect data regarding age, sex, residence, education, marital status, living condition, chronic health conditions, and drug adherence status. Polypharmacy means intake of five or more drugs. Only the medicines consumed for more than one month and/or advised by the physician to take continuously for chronic health conditions were considered.³ Over-the-counter drugs and drugs used for concurrent illness were excluded.

Each participant/caregiver respondent was asked to report if the individual had ever been diagnosed by a doctor/ relevant health professional with one or more of 20 chronic health conditions mentioned in the Charlson Comorbidity Index scoring system. Multimorbidity was defined as the co-occurrence of two or more chronic health conditions in one person. Drug adherence was assessed by the Morisky Medication Adherence Scale-8 (MMAS-8).⁸ MMAS-8 is a generic self-reported, medication-taking behavior scale used for various medical conditions. MMAS-8 scores ≤ 2 were considered adherent to medication and a score > 2 were categorized as non-adherent. Patients using polypharmacy are non adherent drug. Different comorbidity are associated in 60%-100% of cases.

Data were analyzed by using SPSS for Windows version 23 software. Continuous variables were reported as the means \pm SD and categorical variables were declared as frequency (Percentages). The student's *t*-test compared the mean age between the adherent and nonadherent groups. Association between sex, drug adherence status, different comorbidities, and polypharmacy were assessed by Chi-square or Fisher's exact test as appropriate. Odds Ratios (OR) and respective 95% Confidence Intervals (CIs) were

estimated for non-adherence. The correlation between total drugs consumed and the Pearson correlation coefficient assessed the MMAS-8 score. A p-value <0.05 was considered statistically significant.

RESULTS

In the present study, 200 individuals were included. There was male predominance with 62% male and 38% female. The average age of participants was 65.56 ± 6.9 years, with a range of 60-85 years (Table I).

Table I Age and sex distribution of the studied patients (n=200)

Variables	Frequency	Percentage
Age, in years	Mean ± SD	65.56±6.9
	Range	60-85
	60-64 years	90 (45.0)
	65-69 years	34 (17.0)
	70-74 years	36 (18.0)
	75-79 years	24 (12.0)
	≥80 years	16 (8.0)
Gender	Male	124 (62.0)
	Female	76 (38.0)

Data are expressed as frequency (Percentage) if not otherwise mentioned.

Among all participants lived with spouses and married children. All of them were married, and 23% were widowed. The majority of them were illiterate, not working, and dependent economically on others (Table II).

Table II Distribution of socio-economic characteristics of the patients (n=200)

Variables	Frequency	Percentage
Live with whom	Spouse only	6 (3.0)
	Spouse with unmarried child	44 (22.0)
	Spouse with a married child	146 (73.0)
	Other	4 (2.0)
Marital status	Married	154 (77.0)
	Widowed	46 (23.0)
Educational level	Illiterate	130 (65.0)
	Primary	38 (19.0)
	Secondary	24 (12.0)
	Higher secondary and above	8 (4.0)
Vocational status	Working	22 (11.0)
	Not working	178 (89.0)
Economic dependency	Independent	4 (2.0)
	Partly dependent	16 (8.0)
	Dependent	180 (90.0)

Among the chronic comorbidities, diabetes mellitus, hypertension, chronic obstructive pulmonary disease and heart diseases were the most prevalent diseases among the participants (Figure 1). Five patients had no history of comorbidity. Most of them (52%) had 1-2 comorbid conditions and 43% had three or more chronic health conditions.

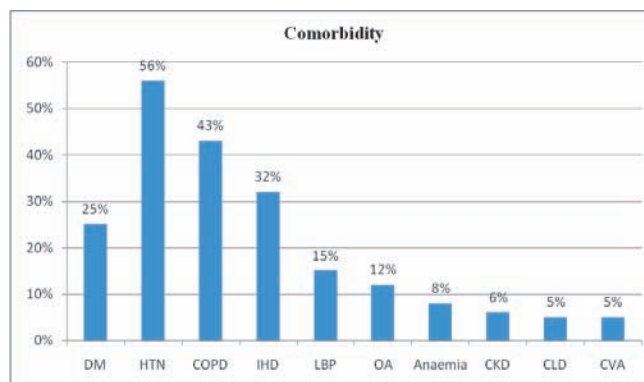


Figure 1 Prevalence of different comorbidities in the studied patients (COPD: Chronic Obstructive Pulmonary Disease, DM: Diabetes mellitus, HTN: Hypertension, IHD: Ischemic Heart Disease, LBP: Low Back Pain. OA: Osteoarthritis, CKD: Chronic Kidney Disease, CLD: Chronic Liver Disease, CVA: Cerebrovascular Accident)

In this study, only four individuals (2.0%) consumed no medications, while 56.0% of the participants had polypharmacy. There was no significant gender difference in polypharmacy in the study (p=0.595) [Figure 2].

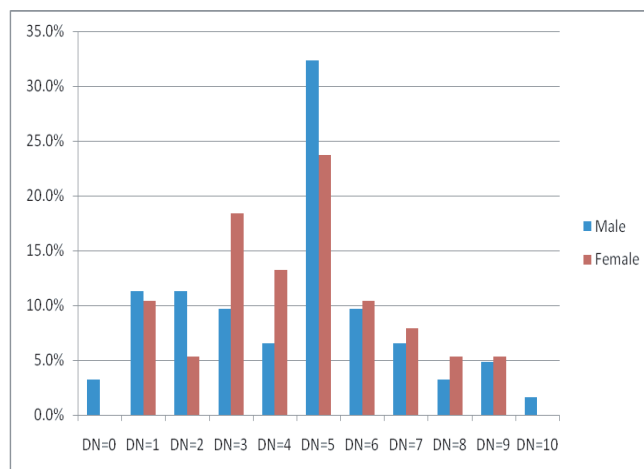


Figure 2 Percentage of drug users in terms of Drug Number (DN) and sex in elderly patients

Accordingly, 56% of the studied elderly patients were found to have a history of polypharmacy (Figure 3).

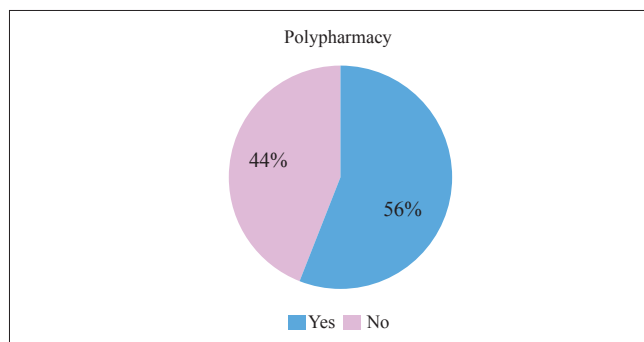


Figure 3 Prevalence of polypharmacy among the geriatric patients

Though the mean age was comparatively higher among the elderly with polypharmacy than the elderly without, the difference was not statistically significant. Likewise, there was a statistically non-significant higher prevalence of polypharmacy among males than females (Table III).

Table III Association between polypharmacy and sex of the patients

Variables	Polypharmacy		p-value
	No (n=88)	Yes (n=112)	
Age, in years			
Mean ±SD	69.95±7.26	66.25±6.83	0.620†
Sex			
Male	52(41.9%)	72(58.1%)	0.595*
Female	36(47.4%)	40(52.6%)	

†Independent sample t-test, *Chi-square test.

Though the proportion of polypharmacy was higher in patients aged 65 years and older than the patients aged below 65 years (61.8% versus 48.9%), the difference failed to reach statistical significance (p=0.067).

Table IV Association between polypharmacy and age of the patients

Age, in years	Polypharmacy		p-value
	No	Yes	
<65 years (n=90)	46 (51.1)	44 (48.9)	0.067*
≥65 years (n=110)	42 (38.2)	68 (61.8)	

Data were expressed as frequency (%). *Chi-square test

Drug adherence status of the patients were evaluated by MMAS-8 score. Patients with a score ≤ 2 were categorized as adherent to their prescribed drugs. The prevalence of adherence and non-adherence were almost equal in the study (Figure 4).

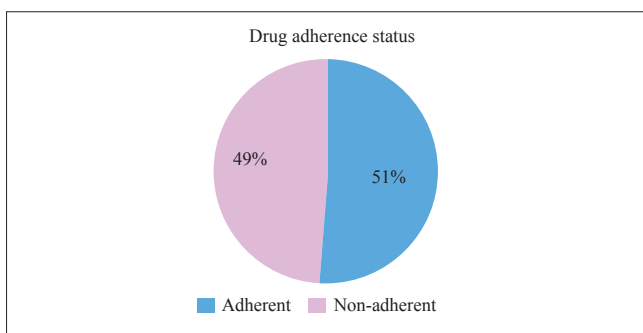


Figure 4 Drug adherence status of the geriatric patients

A statistically significant association was observed between polypharmacy and drug adherence status in the present study. Patients with polypharmacy were 2.5 times more likely to be nonadherent to their prescribed drug than the elderly patients without polypharmacy (Table V).

Table V Association between polypharmacy and drug adherence status of the patients

Polypharmacy	Drug adherence status		Odds Ratio (95% CI)	p-value*
	Adherent (n=102)	Non-adherent (n=98)		
No (n=44)	56 (63.6%)	32 (36.4%)	2.5 (1.1-5.7)	0.025
Yes (n=56)	46 (41.1%)	66 (58.9%)		

* Chi-square test, CI: Confidence Interval.

A scattered diagram was plotted (Figure 5) to determine the correlation between the total number of drugs consumed by the patients and their MMAS-8 scale score. It depicts a significant positive correlation between these two variables (r=0.313, p=0.002). As a higher MMAS-8 score indicates a higher degree of non-adherence, patients with higher drugs were more likely to be more nonadherent.

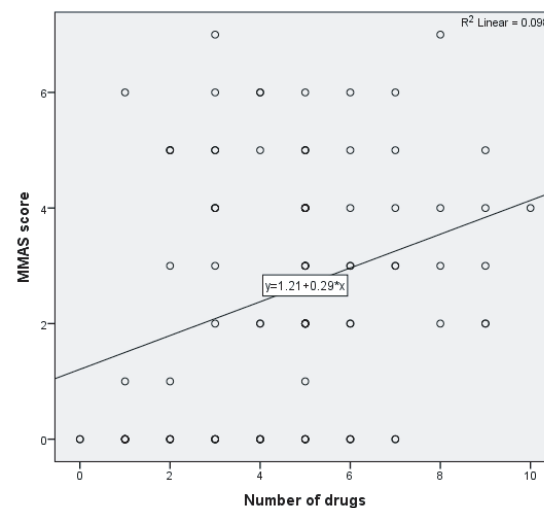


Figure 5 Correlation between number of drugs used and MMAS score

Table VI depicts that polypharmacy had a significant association with disease conditions like DM, HTN, COAD, IHD, OA and CKD.

Table VI Distribution of comorbidities and the percentage of polypharmacy associated with each disease

Comorbidity	Polypharmacy		p-value*
	No	Yes	
DM	10(20.0%)	40(80.0%)	0.005
HTN	36(32.1%)	38 (67.9%)	0.007
COAD	26(30.2%)	60(69.8%)	0.016
IHD	6(9.4%)	58(90.6%)	<0.001
LBP	16(53.3%)	14(46.7%)	0.433
OA	16 (80.0%)	4(20.0%)	0.016
Anaemia	10 (62.5%)	6 (37.5%)	0.227
CKD	0 (0%)	12 (100%)	0.03
CVD	0 (0%)	10 (100%)	0.065
CLD	2 (20.0%)	8 (80.0%)	0.267

*Chi-square test or Fisher’s exact test.

DISCUSSION

The prevalence of polypharmacy in the present study was 56%. Among elderly patients, the majority of polypharmacy ranges from 20 to 60% in the previous survey, perhaps reflecting different criteria in selecting patients and collecting medication data.⁹ For instance, in the REPOSI study, a registry based on an Italian network of 38 internal medicine wards, 52% of patients aged 65 years or older took five or more drugs at hospital admission. This had risen to 67% at discharge.¹⁰ The proportion of older adults in Sweden exposed to polypharmacy was 44%.¹¹ However, contrasting findings are also available. For example, a study from Brazil shows prevalence to be 18.1% in patients more than 65 years.¹² The reasons for the increased prevalence of polypharmacy in our study could be multiple. Firstly, ours being a tertiary referral center, the patients included in the study took various medications for different chronic health conditions. Here most patients are referred because of complicated diseases or multiple morbidities. Other reasons for polypharmacy might be the physicians' absence of medication reconciliation practices and the addition of drugs due to numerous medical visits, resulting in drug duplications and prescription of inappropriate medications. It is to be noted here that only the drugs consumed for more than one month and/or advised by the physician to take continuously for chronic health conditions were considered. Over-the-counter medicines and drugs used for concurrent illness were excluded from the present study.

In the current study, 43% of aged patients suffered from more than two chronic diseases. Among the chronic comorbidities, diabetes mellitus, hypertension, chronic obstructive pulmonary disease, and heart diseases were the most prevalent diseases. Moreover, polypharmacy increased significantly with comorbidities and the highest incidence of polypharmacy was, respectively, in patients with heart disease, diabetes and pulmonary disease. Furthermore, in the present study, polypharmacy had no significant relation with some chronic diseases such as liver and CVD. Similar findings were observed in other studies.¹³

The most widely consumed group of medications in both genders was the cardiovascular hypertension group in the current study. Like our study, in Nobili et al.'s study and Hosseini et al.'s study too, cardiovascular medications were the most prevalently consumed medication among the elderly.^{9,14}

The prevalence of non-adherence in elderly patients receiving polypharmacy ranged from 6 to 55%. Medication adherence was negatively associated with a more significant number of drugs.¹⁵ In the present study, most of the patients with polypharmacy (59%) were nonadherent to their medications, compared to 36.4% of the patients without polypharmacy.

In the present study, the average age of patients without polypharmacy was 69.95 ± 7.26 , and the average age of participants with polypharmacy was 66.25 ± 6.83 years, which had no significant difference. It agreed with another study conducted in Iran.¹⁴ However, in other studies, polypharmacy consumption pattern was associated with an increase in age. In a study in New Zealand, the risk of polypharmacy and hyper polypharmacy was higher in 80–84 years.¹⁰ Moreover, in a study in Taiwan, patients with the highest percentage of polypharmacy were 75–84 years old.¹⁶ According to studies mentioned, polypharmacy in the elderly has increased with age. It can be said that since the number of chronic comorbidities and other problems of the elderly increases with age, the incidence of polypharmacy will increase consequently. However, the representation of the elderly old in the present study was minimum to draw any such conclusion.

LIMITATION

The sample size was relatively small and from a single center. The selection of the patients will inevitably result in biases, affecting the generalizability of the results. No control group was included, and the analyses were primarily descriptive, limiting the internal and external validity of the results. The disease load might have been underestimated since the skin, ear or eye diseases were not counted.

CONCLUSION

This study indicated that polypharmacy was high in the older adults attending the OPD department of a tertiary level hospital in Bangladesh. Most of the patients were suffering from different comorbid chronic health conditions. About half of the patients were not adherent to their prescribed drugs among the studied patients. Patients with polypharmacy were more likely to be non-adherent than the elderly patients without polypharmacy.

RECOMMENDATION

Health care professionals (Doctors, Pharmacists, Nurse) should be aware of the risks and thoroughly evaluate all medications at each geriatric patient visit

to prevent polypharmacy. Further well-designed prospective studies are needed to confirm the association between polypharmacy and other ADR in older people and explore whether minimizing the number of medications used might prevent ADR.

ACKNOWLEDGEMENT

The author's express their gratitude to the respondents, Director & all the associates of Medicine OPD of BITID, Chattogram.

CONTRIBUTION OF AUTHORS

BB-Conception, design, acquisition of data, drafting & final approval.

MKD-Data analysis, drafting & final approval.

IIK-Interpretation of data, critical revision & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. Salive ME. Multimorbidity in older adults. *Epidemiologic reviews*. 2013;35(1):75-83.
2. Nobili A, Garattini S, Mannucci PM. Multiple diseases and polypharmacy in the elderly: Challenges for the internist of the third millennium. *Journal of comorbidity*. 2011;1(1):28-44.
3. Masnoon N, Shakib S, Kalisch-Ellett L, Caughey GE. What is polypharmacy? A systematic review of definitions. *BMC geriatrics*. 2017;17(1):1-0.
4. Magaziner J, Cadigan DA, Fedder DO, Hebel JR. Medication use and functional decline among community dwelling older women. *J Aging Health*. 1989; 1:470- 484.
5. Espino DV, Bazaldua OV, Palmer RF, et al. Suboptimal medication use and mortality in an older adult community- based cohort: Results from the Hispanic EPESE Study. *J Gerontol A Biol Sci Med Sci*. 2006; 61:170-175.
6. Masoudi FA, Baillie CA, Wang Y, et al. The complexity and cost of drug regimens of older patients hospitalized with heart failure in the United States, 1998-2001. *Arch Intern Med*. 2005;165:2069-2076.
7. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. *The American Journal of Geriatric Pharmacotherapy*. 2007; 5(4): 345–351.
8. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med. Care*.1986; 24:67–74.
9. Nobili A, Garattini S, Mannucci PM. Multiple diseases and polypharmacy in the elderly: Challenges for the internist of the third millennium. *Journal of comorbidity*. 2011;1(1):28-44.
10. Nobili A, Marengoni A, Tettamanti M, Salerno F, Pasina L, Franchi C, et al. Association between clusters of diseases and polypharmacy in hospitalized elderly patients: Results from the REPOSI study. *European journal of internal medicine*. 2011;22(6):597-602.
11. Morin L, Johnell K, Laroche ML, Fastbom J, Wastesson JW. The epidemiology of polypharmacy in older adults: register-based prospective cohort study. *Clin Epidemiol*. 2018;10:289–298.
12. Nascimento RC, Álvares J, Guerra AA, Gomes IC, Silveira MR, Costa EA, Leite SN, Costa KS, Soeiro OM, Guibu IA, Karnikowski MG. Polypharmacy: A challenge for the primary health care of the Brazilian Unified Health System. *Revista de saude publica*. 2017;51.
13. Vrettos I, Voukelatou P, Katsoras A, Theotoka D, Kalliakmanis A. Diseases linked to polypharmacy in elderly patients. *Current gerontology and geriatrics research*. 2017.
14. Hosseini SR, Zabihi A, Jafarian Amiri SR, Bijani A. Polypharmacy among the elderly. *J Mid-life Health*. 2018;9:97-103.
15. Zelko E, Klemenc-Ketis Z, Tusek-Bunc K. Medication adherence in elderly with polypharmacy living at home: A systematic review of existing studies. *Mater Sociomed*. 2016;28(2):129–132.
16. Slabaugh SL, Maio V, Templin M, Abouzaid S. Prevalence and risk of polypharmacy among the elderly in an outpatient setting: A retrospective cohort study in the Emilia Romagna region, Italy. *Drugs Aging*. 2010;27:1019 -1028.

Patterns of Smoking Behaviors among the Physicians Chattogram, Bangladesh

Rajat Sanker Roy Biswas^{1*} Fazlee Kibria Chowdhury² Tushar Kanti Nath³
Jishu Dev Nath¹ Shaikh Md Hasan Mamun⁴

ABSTRACT











Background: Smoking is a major health burden in our country. Health professionals are not free from this behavior also. So the objective of the present study is to observe patterns of smoking behaviors among the physicians.

Materials and methods: This cross sectional study was conducted in a tertiary care hospital Chittagong, Bangladesh among the registered working physicians. After entering the physicians' room he/she was asked to join the study after explaining the aims and objectives of the study. After getting their consent a structured pretested anonymous questionnaire was administered and he/she was asked to fill it. After seven days it was collected ignoring whether it is filled or not. Data was analyzed later by SPSS.

Results: Among 102 physicians responded the questionnaire, male was more 68(66.7%), most were married 54(52.9%), 62(60.7%) were <30 years and 24(23.5%) were at age group 31-40 years. Smoking behaviors analysis revealed 6(20%) were regular smoker, 4(13.33%) were irregular, 14(46.66%) were occasional and 6(20%) were ex smokers and total smokers were 30(29.4%) among 102 physicians. Regarding co morbidities PUD, chronic cough and HTN were found significantly higher

GRAPHICAL ABSTRACT

Patterns of Smoking Behaviors among the Physicians

Materials and methods	Results			
Cross Sectional Study Samples - 102  Smokers - 30  Regular Smoker - 6 Irregular Smoker - 18 Ex-Smoker - 6 Non Smoker - 72 	Co-morbidities condition			
	Co-morbidities <input type="checkbox"/>	Smoking Group (30) <input type="checkbox"/>	Non-Smoking Group (72) <input type="checkbox"/>	p-Value
	HTN <input type="checkbox"/> 	23 (76.66%) <input type="checkbox"/>	15 (20.83%) <input type="checkbox"/>	< 0.05
	Chronic Cough <input type="checkbox"/> 	18 (60%) <input type="checkbox"/>	7 (9.72%) <input type="checkbox"/>	< 0.05
	IHD <input type="checkbox"/> 	2 (6.66%) <input type="checkbox"/>	1 (1.30%) <input type="checkbox"/>	> 0.05
	DM <input type="checkbox"/> 	6 (20%) <input type="checkbox"/>	8 (11.11%) <input type="checkbox"/>	> 0.05
	Smoking related activities and behaviors			
		Working place smoking <input type="checkbox"/>	12 (40%)	
		Want to quit <input type="checkbox"/>	12 (40%)	
		Smoking due to stress <input type="checkbox"/>	10 (33.33%)	

Conclusion : HTN and Chronic cough are the predominant co-morbidities of smoker. Less than 50% want to quit. Stress relief is the potential cause of start smoking in one third of cases.

Biswas R S R et al.

Ctg Med Uni J. 2022;2(1): 50-53.

- Associate Professor of Medicine
Chattogram Maa-O-Shishu Hospital Medical College, Chattogram, Bangladesh.
 - Assistant Professor of Respiratory Medicine
Chattogram Maa-O-Shishu Hospital Medical College, Chattogram, Bangladesh.
 - Lecturer of Physiology
Chattogram Maa-O-Shishu Hospital Medical College, Chattogram, Bangladesh.
 - Professor of Medicine
Chattogram Maa-O-Shishu Hospital Medical College, Chattogram, Bangladesh.
- *Correspondence to: **Dr. Rajat Sanker Roy Biswas**
Cell: +88 01819 80 84 33
Email: Rajatbiswas76@yahoo.com

Submitted on 28th January 2022
Accepted on 20th February 2022

($p < 0.05$) among the smoker group than nonsmokers. Stress relief was the common cause of smoking (33.33%). 2(6.66%) declared that they smoke at workplace, 3(10%) noticed that they smoke in front of colleague and 12(40%) thinks of quitting smoking. Mean age of the physicians were 35.82 years, maximum duration of smoking was 40 years, mean number of sticks per day was 6.20, mean cost per day was 73.00 taka and starting age was 18 years among some physicians.

Conclusion: Smoking prevalence is alarming among physicians in Chittagong, Bangladesh. Physician smoking behavior and knowledge of smoking related health outcomes in Bangladesh influences whether they counsel patients regarding smoking.

Key words: Physicians; Smoking; Tobacco.

INTRODUCTION

Diseases resulting from tobacco smoking are a global burden. These burdens falls more on developing countries, where an estimated 84% of the world's 1.3 billion current smokers live.¹ The prevalence of smoking is reducing in developed countries but as like other third world countries, Bangladesh is experiencing an increasing trend of smoking. Still very little is known about the pattern and prevalence of smoking in general and specifically among the physicians, who may play an important role in reducing the tobacco consumption and also helping the treatment of tobacco related complications.

In 1965, the percentage of current smokers in those aged 18 or more was 51.9 for men, 33.9 for women in United States. As result of continuous effort by the year 2002, corresponding percentages declined to 25.2 for men (51% decrease), 20.0 for women (41% decrease).²

Smoking prevalence in females in Bangladesh was 1.96% and in male it was 46.36% in 2009, according to a World Bank report, published in 2010. Prevalence of smoking (Female and male) is the percentage of ages 15 and over who smoke any form of tobacco, including cigarettes, cigars, and pipes and excluding smokeless tobacco.^{3,4}

Health care professionals can have an important role to fight against tobacco. Among them, physicians occupy a key position in this regard, as they are uniquely placed to lead smoking cessation programs in the community. They can help to educate the population, they can support anti-smoking policies and also they can influence national and global tobacco control efforts. Patients of Bangladesh usually wants information, help and guidance from their primary care physician on a number of health-related matters. Physicians also play an important role in helping patients to stop smoking. So it is a nice opportunity to do a study on this ground, to know how many physicians are also indulged to smoking.

MATERIALS AND METHODS

This is a cross sectional study done in a tertiary care hospital, Chattogram during a period of one year from July 2019 to June 2020. There are different preclinical, para clinical and clinical department where about 400 physicians works. Prior permission was

taken from the Hospital and college authority was taken after collection of ethical clearance from the ERB. At morning different department are gathered in the morning meeting and there, a pre tested questionnaire which is adopted from standard World Health Organization (WHO) were supplied to them who were present at 8.30 am. A total of 102 physicians were provided the questionnaire after getting their consent and he/she was asked to fill it. Female to male physician is 1:2. There is no female physician who is smoker. Those who did not provided consent were excluded from the study. After seven days it was collected ignoring whether it is filled or not from their room. Statistical analysis were performed with SPSS version 20.0 (Chicago, Illinois, USA) which allows analysis.

RESULTS

Table I General characteristics of the physician (n=102)

General characteristics		Frequency	Percent
Response	Responded	102	98.0
	Not interested	2	2.0
Gender	Male	68	66.7
	Female	34	33.3
Age group	<30 years	62	60.7
	31-40 years	24	23.5
	41-50 years	10	9.8
	50-60 years	4	3.9
	>61 years	2	1.9

Table I showing among 102 physicians responded the questionnaire, where male was more 68(66.7%), 62(60.7%) were <30 years, 24(23.5%) were 31-40 years, 10(9.8%) were 41-50 years, 4(3.9%) were 51-60 years and 2(1.9%) were >61 years.

Table II Smoking behaviors of study physicians (n=30)

Behaviors	Frequency	Percent
Regular	6	20
Irregular	4	13.3
Occasional	14	46.66
Ex- smoker	6	20.0
Total	30	100

Table II showing smoking behaviors where 6(20%) were regular smoker, 4(13.33%) were irregular, 14(46.66%) were occasional and 6(20%) were ex-smokers.

Table III Co morbidities of the smoking(n=30) and non-smoking (n=72) physicians

Co morbidities	Smoking group (n=30)(n/%)	Non smokers (n=72)(n/%)	p value
IHD	2(6.66)	1(1.30)	>0.05
PUD	16(53.33)	18(25.0)	<0.05
Chronic cough	18(60.0)	7(9.72)	<0.05
COPD	1(3.33)	0	
HTN	23(76.66)	15(20.83)	<0.05
DM	6(20.0)	8(11.11)	>0.05

Regarding co morbidities IHD (6.66% vs 1.30%), PUD (53.33% vs 25.0%), COPD (3.33% vs 0%), Chronic cough (60.0% vs 9.72%), HTN (76.66% vs 20.83%) and DM (20.0% vs 11.11%) were found common co morbidities among smokers and non smoker physicians. PUD, chronic cough and HTN were found significantly higher ($p<0.05$) among the smoker group.

Table IV Smoking related activities and behaviors (n=30)

Related activities	Frequency	Percent
Causes	No answer	10 33.33
	Stress relief	10 33.33
	Habit	2 6.66
	Nothing	8 26.6
	Fun	2 6.66
Workplace smoking	Yes	2 6.66
	No	12 40.0
	No answer	16 53.3
Smoking in front of colleague	Yes	3 10.0
In front of patients		0 0
Want to quit	Yes	12 40.0

Upon questioning stress relief was the common cause of smoking (33.33%). 2(6.66%) declared that they smoke at workplace, 3(10%) noticed that they smoke in front of colleague and 12(40%) thinks of quitting smoking.

Table V Descriptive parameters related to smoking

Parameters	N	Minimum	Maximum	Mean	Std. Deviation
Age (Years)	102	24	72	35.82	12.820
Duration of smoking (Years)	30	1	40	11.82	12.901
Number of stick	30	2	16	6.20	5.347
Cost per day (Taka)	30	15	200	73.00	60.203
Starting age (Years)	30	18	40	23.73	6.174

Mean age of the physicians were 35,82 years, maximum duration of smoking was 40 years, mean number of sticks per day was 6.20, mean cost per day was 73.00 taka and starting age was 18 years among some physicians.

DISCUSSION

The global burden of disease resulting from tobacco smoking is well understood. Tobacco smoking prevention and cessation efforts, primarily in developed countries, have been effective at reducing heart disease, cancer, and other smoking-related illnesses. Prevention efforts in the United States have combined elements of health education, cessation techniques, and legislative activity to address the smoking problem. Large decreases in smoking prevalence illustrate the success of these efforts.⁵

Healthcare workers have been shown to play an important role in tobacco prevention. Primary care physicians in particular are one of the most powerful groups at lowering the acceptability of smoking in various social contexts, a process often called "denormalization".⁶ The current study provides information that may be useful in designing smoking prevention and cessation programs that involve physicians in Bangladesh.

In the present study, the prevalence of current smoking among physicians was 20% among total 30(29.4%) smokers. Current smoking estimates of 22.3% and 28.5% were found among college students in USA in the years 1993 and 1971.⁷ Prevalence of smoking among college students studying in private and public colleges in three towns of Karachi was 24% as described by Rozis, Butt and Akhtar in their study correlates of cigarette smoking among male college students in Karachi, Pakistan.⁸ However, a study conducted in Karachi on school going adolescents reported a prevalence of current smoking to be 13.7%.^{8,9}

In a study, the prevalence of smoking among secondary school teachers in Bangladesh was 17%.¹⁰ The finding is lower compared to other studies in school personnel.^{11,12} Gender is a statistically significant predictor for smoking among the school teacher in their study. But in our study no female was found as smoker. But in that study showed that male was 37.46 times more likely to smoke than female. This finding is consistent with other findings of high proportion of male tobacco.^{11,12} There are less female smokers than males, especially in developing countries, probably related to the social norm that has been long formed in many societies.

Regarding why physicians smoke revealed stress relief was the common cause of smoking (33.33%). 2(6.66%) declared that they smoke at workplace, 3(10%) noticed that they smoke in front of colleague,

none smokes in front of patients and 12(40%) thinks of quitting smoking. The results of this study demonstrate that many physicians in Bangladesh, rather than acting as the important resource they could be, may in fact be eroding the effect of tobacco prevention and control efforts by reinforcing the normalization of tobacco through their attitudes and practices. Males smoke and none of the female physicians was found as smokers or denied to do so. None smoked in the presence of patients may believe that their behavior may influence others and they do fully understand the harmful effects of smoking.

LIMITATION

- It was a single center study.
- Small sample size.

CONCLUSION

HTN and Chronic cough are the predominant comorbidities of smoker. Less than 50% want to quit. Stress relief is the potential cause of start smoking in one third of cases.

ACKNOWLEDGEMENT

All the authors express heartfelt thanks to the all participants.

RECOMMENDATION

Large scale multicenter study with nationally representative sample to get the country scenario. To do more studies on different health professionals like nurses, technologist, pharmacists to get the data of smoking habits among the different health care workers.

CONTRIBUTION OF AUTHORS

RSRB-Design, data analysis, drafting & final approval.

FKC-Acquisition of data, interpretation of data, drafting & final approval.

TKN –Acquisition of data, drafting & final approval.

JDN-Interpretation of data, critical revision & final approval.

SMHM-Conception, critical revision & final approval.

DISCLOSURE

The work was provided by partial fund of Chittagong Medical University, Chattogram.

REFERENCES

1. Reid DJ, Mcneil AD, Glynn TJ, Reducing the prevalence of smoking in youth in western countries: An international overview, *Tobacco control*. 1995; 4:266.
2. World Health Organization. WHO report on the global tobacco epidemic. 2009.
3. Chowdhury MT, Pau A, Croucher R. Bangladeshi dental students' knowledge, attitudes and behaviour regarding tobacco control and oral cancer. *J Cancer Educ*. 2010;25(3):391-395.
4. Tarafdar AMA, Nahar S, Rahman MM, Hussain SMA, Zaki M. Prevalence and determinants of smoking among the college students in selected district of Bangladesh *Bangladesh Medical Journal*, 2009 38(1): 3-8.
5. Perrin PC, Merrill RM, Lindsay GB Patterns of smoking behavior among physicians in Yerevan, Armenia *BMC Public Health*. 2006, 6:139.
6. Bal DG, Lloyd JC, Manley MW: The role of the primary care physician in tobacco use prevention and cessation. *CA Cancer J Clin*. 1995;45:369-374.
7. Emmon KM, Wechsler H, Dowdall G, Abraham M, Predictors of smoking among US college students; *Am J Public Health*. 1998; 88, 104-107.
8. Rozi S, Butt ZA, Akhter S, Correlates of cigarette smoking among male college students in Karachi, Pakistan, *BMC Public Health*. 2007;7:312.
9. Rozi S, Akhter S, Ali S, Khan J, Prevalence and factors associated with current smoking among high adolescents in Karachi, Pakistan; *Southeast Asian J Trop Med Public Health*. 2005; 36, 498-504.
10. Rahman MM, Karim MJ, Ahmad SA Prevalence and Determinants of Smoking Behaviour among the Secondary School Teachers in Bangladesh, *International Journal of Public Health Research Special Issue*. 2011;5:25-32.
11. World Health Organization. Report on Global Youth Tobacco Survey (GYTS) and Global School Personnel Survey (GSPS) in Bangladesh. 2008. http://www.searo.who.int/LinkFiles/GYTS_BAN2007.pdf [Accessed November 1, 2020].
12. Sah, S.K. A study on patterns of tobacco use among school teachers in Mahottary district of Nepal. *Journal of Nepal Health Research Council*. 2018;5(1):44-49.

Name of Reviewers (March 2022)

Editorial Review & Graphical Abstract Creator

- **Professor (Dr) Pradip Kumar Dutta**
 - Professor of Nephrology & Member, Academic Council
 - Chittagong Medical University, Chattogram.

Peer Review

- **Professor (Dr) Pravat Chandra Barua**
 - Head, Department of Community Medicine (Retired)
 - Chittagong Medical College, Chattogram.
- **Professor (Dr) A S M Mostaque Ahmed**
 - Principal & Head
 - Department of Pathology
 - Chattagram Maa-O-Shishu Hospital Medical College, Chattogram.
- **Professor (Dr) Chiranjib Barua Chowdhury**
 - Head, Department of Neonatology (Retired)
 - Chittagong Medical College, Chattogram.
- **Professor (Dr) M. Jalal Uddin**
 - Head, Department of Community Medicine
 - Chattagram Maa-O-Shishu Hospital Medical College, Chattogram.
- **Professor (Dr) Joyabrata Das**
 - Principal & Head
 - Department of Medicine
 - Southern Medical College, Chattogram.
- **Professor (Dr) Dhananjoy Majumdar**
 - Head, Department of ENT
 - Southern Medical College, Chattogram
- **Professor (Dr) Md Nur Hossain Bhuiyan**
 - Department of Surgery
 - Dhaka Medical College, Dhaka.
- **Dr. Hasina Nasreen**
 - Registrar (Incharge)
 - Chittagong Medical University, Chattogram.

(List is not according to Seniority)



Chittagong Medical University Journal

BITID Building, Faujdarhat, Chattogram, Bangladesh.
Phone : 88-031-2780430, 88-031-2780428 Email : research@cmu.edu.bd
www. cmu.edu.bd

Guidelines for Authors

General Information

Chittagong Medical University (CMU) Journal welcomes the submission of manuscripts of scientific excellence. The submitting author is responsible for ensuring the article's publication has been signed approved by all the co-authors. All enquiries concerning the publication accepted papers should be addressed to Chief Editor. Electronic submission of manuscripts only allowed.

Chittagong Medical University (CMU) commenced to publish a Scientific Journal from 1st March 2021. CMU Journal is published biannually eg March and September.

Paper (Manuscript) written in English are to be send in MS Word by Email : research@cmu.edu.bd. PDF format is not accepted.

A cover letter should include the corresponding author's full address. Cell no and Email ID.

A short running head of no more than 40 characters (Including letter and spaces) should be mentioned.

Manuscript

Manuscripts should be in accordance with Vancouver style. The length of the text should be 2500 words for Original Paper, 3000 for Review Article, 1200 for Case Reports and 1000 for Letters to Editor excluding abstract, table, figure and references. Compose text in MS Word in Times New Roman style with the font size of 12 having a double space.

Title Page

- The title of the article should be precise, sensitive and specific.
- It should not be more than 20 words.
- Avoid abbreviations and punctuation mark in title.
- Name of the authors and coauthors with his or her highest academic qualification, designation and institutional affiliation.
- In title case (Not All Capitals) :
eg. Atlas of Chronic Kidney Disease and End Stage Renal Disorder in United State.

Abstract

Structured abstract should consist of four paragraphs including Background with Objective, Materials and methods, Main Result with Discussion and Principal Conclusion in case of Original Article. Articles on clinical trials should contain abstracts that include the items that the CONSORT group has identified as essentials ([http://www. consort-statement.org](http://www.consort-statement.org)).

For Case Report three paragraphs, including Background with Objective, Case Report and Conclusion. They should briefly describe respectively, the problem being addressed in the study, how the study was performed, the salient results and what the authors conclude from the results. Three to six key words should be included below the abstract arranging in alphabetical order. The abstract should not exceed 200 words. Avoid abbreviations and references in abstract.

Text

Original Papers should be divided into sections: Introduction, Materials and methods, Results, Discussion, Limitation, Conclusion, Recommendation, Acknowledgment, Authors Contribution & Disclosure.

The sections of a Review Article should be: Introduction, Search strategy, Discussion, Conclusion & Disclosure. Case Report should be presented in format like: Introduction, Case Report, Images, Discussion, Conclusion & Disclosure.

Introduction

- Word limit 150 (For Case Report) to 500 (For Original Article and Clinical Trail).
- Provide a context or background for the study (That is, the nature of the problem and its significance). It should be very specific, identify the specify knowledge in the aspect, reasoning and what the study aim to answer.
- State the specific purpose or research objective of or hypothesis tested by, the study or observation, the research objective is often more sharply focused when stated as a question.
- Both the main and secondary objectives should be clear.
- Provide only directly pertinent primary references and do not include data or conclusions from the work being reported.

Materials and methods

- Clear and concise description of participants and procedure.
- Study design.
- Duration and place of study.
- Ethical approval.
- Patient consent.
- Statistical analysis.
(Word limit 250-300).

Results

The Results section should present the collected data and analysis only. Results for all measures should be reported in a concise, straight forward manner, using tables or figures when appropriate. Avoid data redundancy. Do not repeat data of the tables and figures in summarization of result section. (Word limit 200-250).

Tables

They should be prepared on separate pages, to be attached at the end of papers. They should follow the text references following their first citation and numbered consecutively using Roman numerals (eg. Table I, II) on the top of the table followed by a brief title. Authors should place explanatory matter in footnotes, not in the heading. Explain all nonstandard abbreviations in footnotes and use the following symbols, in sequence :

*, †, ‡, §, ¶, **, ††, ‡‡, §§, __, , etc.

Identify statistical measures of variations, such as standard deviation and standard error of the mean.

Figures

They should be prepared on separate pages, to be attached at the end of papers. They should be numbered using Arabic numerals (e.g. Figure 1, 2) on the bottom of the figure followed by a brief title. In case of already published figure, acknowledge the original source and submit written permission from copyright holder. Legends for figure should be mentioned with the brief title of the figure.

Total numbers of the tables and figure should be within six in Original and Review article. In case of special need there has to be an explanatory note about the extra numbers of tables or figures. In Case report only one table is allowed. No punctuation mark, in the brief title of table & figure.

Discussion

- Avoid unnecessary explanation of someone else work unless it is very relevant to the study.
- Provide and discuss with the literatures to support the study.
- Mention about limitation of your study.
(Word limit 500-700)

Conclusion

- Give conclusion of your study.
- Any recommendation for future research.

Acknowledgement

- Acknowledge any person or institute who have helped for the study.

Contribution of authors

The persons involved with all the following

- i) Initial research design / Conception / Acquisition of data / Data interpretation / Analysis.
- ii) Manuscript drafting / Critical revision of content.
- iii) Final approval.

Above cited categories must be met. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.

Any authors name seemed to be guest and ghost authors, eg. Not relative with discipline of the matter will jeopardise the acceptance of the manuscript.

Disclosure

The authors should disclosed the competing interests or any funding source.

References

References should be prepared in accordance with the Vancouver style. At least 3/5 nos of current references (2018 and above) are to be mentioned with other references in the manuscript. Number of references should be at least 15, but not more than 30 in case of Original and Review article. In Case report references should be within the limit of 10 to 15. Number of the references consecutively in the order in which they first appear in the text. Identify them in Arabic numerical Super scripted at the end of the sentences after the fullstop [eg^{1,2}].

Book references

Book references : Book references should have the name of the chapter authors, chapter title, editors, book name, the edition, place of publication, the publisher, the year and the numbers of the relevant pages. Mention the name of first six authors, put 'et al' after that if there are more authors. Entries in the list should be numbered consecutively. Personal communications and unpublished works should only be mentioned in the text.

Example : Book reference : Bernstein D. Epidemiology and Genetic Basis of Congenital Heart Disease. In : Kliegman, St Geme, Blum, editors, Nelson Text Book of Pediatrics, 21st edition, Vol-1, Philadelphia, PA, USA : Elsevier, 2016;2367-2371.

Journal refernece : Rahman MM, Giti S, Kabir SMR, Rashid M. Hematological Changes Associated with Hepatitis by Hepatitis E Virus. Bangabandhu Sheikh Mujib Med Univ J. 2018; 11:291-294.

Internat reference : World Health Organization. Infant and young child feeding. 24 August 2020.

Available from [https : //www.who.int/news-room/fact-sheets/detail/infant and young child feeding](https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding). (Accessed on 15th December 2020).

Plagiarism Policy

Before peer review, all the submitted manuscripts are screened by the Plagiarism detector. According to the International Committee of Medical Journal Editors (ICMJE) less than 20% of Plagiarism are accepted for submitted manuscript.



Chittagong Medical University Journal

BITID Building, Faujdarhat, Chattogram, Bangladesh.
Phone : 88-031-2780430, 88-031-2780428 Email : research@cmu.edu.bd
www. cmu.edu.bd

DECLARATION

I/We the undersigned, solemnly affirm that I/We have read and approved the article under the title

submitted for publication in the CMU Journal

I/We further affirm that :

1. The article mentioned above has not been published before nor submitted for publication in any form, in an other journal by me / an of us.
2. The authorship of this article will not be contested by anybody else whose names is/are not listed here.
3. I/We individually / jointly share the responsibility for the integrity of the content of the manuscript.
4. Each of us have contributed to each section of the paper.
5. Conflict of interest (If any) has been disclosed.
6. We also agree to the authorship of this article in the following sequence
7. If the authorship is contested at any state of publication the article will not be processed till the issue is resolved.

Authors Name (In Sequence)

Signature

1.	-----	-----
2.	-----	-----
3.	-----	-----
4.	-----	-----
5.	-----	-----
6.	-----	-----

Correspondence: Dr.-----

Cell : -----

Email : -----

