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Contents

Editorial	01
Original Articles	
Prevalence of Psoriasis in Outpatient Department of Dermatology and Venereology in North Bengal Medical College Hospital, Sirajganj, Bangladesh	03
<i>Mohd Asaduzzaman Babu, Md Shamim Ahmed, Md Shafiqul Islam, Md Abdul Hamid Mollah</i>	
Surgical Treatment of Diabetic foot infection in a Tertiary Care Hospital of Bangladesh	09
<i>Md Ziaur Rahman, AHM Abdul Wahid, Md Abdul Alim Shaikh, Mir Jalal Uddin, Mir Shakhawat Ali</i>	
Sociodemographic Risk Factors of Community Acquired Pneumonia Among Under Five Children in Rajshahi Medical College Hospital	15
<i>Chaman Ara, Most Firoza Parvin, Laila Shamima Sharmin, Md Ismail Hosssain Khan</i>	
Case Report	
Chilaiditi Syndrome: A Rare Surgical Condition	21
<i>Md Ziaur Rahman, Mir Jalal Uddin, Himika Hasan Khan</i>	
Instructions for the Authors	27



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Integrated Teaching in Medical Curriculum

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The term 'Integration' has been derived from Latin word integer which means synchronization of different activities to ensure acceptable performance. Integration is best represented by our own body where various systems exist and all work in a synchronous way and full integration with each other. So, integration in education means coordination in the teaching learning activities to ensure harmonious functioning of the educational processes which are repeatedly taught in different academic courses or departments.¹⁻³ Therefore, integrated teaching is an effective teaching method for undergraduate medical students to achieve good knowledge and skills. It has been emphasized by academicians that it helps in purposeful, appropriate learning and better understanding of any topic. In medical education, correlation of theoretical and practical knowledge is mandatory. Hence, the teaching should be done in integration where relevant topic of different subjects bring together to teach it in more effective way for the benefit of the patients and society as a whole. Fragmented approach of teaching is the sole disadvantage in the present system of education. This type of learning creates apathy among the students and knowledge gained is not put into practice.⁴ Thus, Bangladesh Medical and Dental Council (BMDC) already incorporated the integrated approach in the medical curriculum in order to provide the students with holistic rather than fragmented learning perspectives.⁵ Subsequently, the integrated thinking offers the capacity to individualize.⁶ Since medical education is related

to community services so, we need to teach our students to correlate the various subject effectively to produce efficient and competency based new medical graduates.

The effectiveness of integrated teaching is dedicated to its mode of implementation. Importance of integration at right time and at right place in curriculum plays a vital role in its operational success. Training of different faculties about newer method of integration plays a crucial role in efficient integrated teaching which needs cooperation amongst various subjects both horizontally and vertically. Integration is the backbone of newer curriculum which is a beam of hope in medical education.

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REFERENCES

1. Basu M, Das P, Chowdhury G. Introducing integrated teaching and comparison with traditional teaching in undergraduate medical curriculum: A pilot study. *Med J DY Patil Univ.* 2015; 8(4): 431-438.
2. Bhuiyan PS, Rege NN, Supe AN. The art of teaching medical students. *Medical Education Technology Cell, Seth G.S. Medical College and K.E.M. Hospital, Mumbai.* 2nd ed. 2002; 305-312.

3. Jogalekar S, Bhuyan PS, Kishore S. Integrated teaching –our experience. J Post grad Med. 1994; 40(4): 231.
4. Doraisamy R, Radhakrishnan S. The effectiveness of integrated teaching over traditional teaching among first year MBBS students: a preliminary study. Med J DY Patil Univ. 2013; 6: 139-140.
5. Arun V, Jamkar, Vishwnath I, Yemul and Gurpreet Singh: Integrated teaching program with student centered case base learning for undergraduates at B J Medical College Pune. www.Faimer.org/education/fellows/abstracts/04jamkar.pdf.
6. Dr. Bipin S, Jain, MD (Hom). Integrtd Medical Education: A Must for Homeopathic Colleges and Homeopaths in the Making. <http://www.hpathy.com/ezone/2009july.asp>.

Prevalence of Psoriasis in Outpatient Department of Dermatology and Venereology in North Bengal Medical College Hospital, Sirajganj, Bangladesh

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ABSTRACT

Introduction: Psoriasis is a common, chronic, recurrent inflammatory skin disease, characterized by erythematous plaque covered with silvery white scales. Determination of the prevalence of psoriasis is important for understanding the burden of this disease in the community. Aim of this study was to determine the prevalence of psoriasis in Sirajganj district of Bangladesh. **Methods:** This cross-sectional descriptive study was carried in the Department of Dermatology and Venereology, North Bengal Medical College Hospital, Sirajganj, Bangladesh during the period of September, 2020 to August, 2021. A total of 36 patients suffering from psoriasis were included for this study. Data were collected by structured questionnaire. Statistical analysis was done by computer software SPSS (V-20). **Results:** Out of 2194 patients, prevalence of psoriasis was 1.6% and mean age was 33.69 ± 13.80 years. Maximum (15, 41.7%) were in 21-40 years of age group and majority were male (26, 72.2%). Farmer and students was common sufferer of psoriasis and plaque psoriasis was common (29, 80.5%). **Conclusion:** Plaque psoriasis is common in this study and this prevalence is useful for estimating the disease burden and promoting initiatives in research, instruction and health policy.

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INTRODUCTION

Skin is the largest organ of the human body and dermatological disorders are common health problem now a day. Almost every individual affected by different type of skin disease at some point in their lives. Psoriasis comes from Greek word psora which means itch.¹It is a common, relapsing, chronic

papulosquamous dermatitis that is distinguished by erythematous papules or plaques that are coated in silvery scales.² The actual cause and mechanism of the disease is unknown but genetic, autoimmune and environmental factors are related to this disease.³ It affects both male and female of all age group throughout the world.⁴

Currently thought that, this disease results from genetically determined immune dysregulation which produce various types of cytokines like TNF, Interferon, IL-12, IL-17 and IL-23.⁵ An unidentified antigen, triggered by environmental stimuli such as trauma, infections, stress, medications, sunlight and metabolic disturbances, is considered to be the cause of this immunological dysregulation. Psoriasis has been linked to a number of genes, although only PSORS1 is well-characterized and verified in 30–50% of individuals.^{6,7} Psoriasis is diagnosed based on the clinical appearance of the skin lesion, but a biopsy is required to confirm and differentiate it from other similar types of illnesses like lichen planus, lichen simplex chronicus, tinea corporis, and seborrheic dermatitis etc.⁸

Prevalence of psoriasis varies from 0.09% to 11.4% in different regions of the world.^{9,10} Psoriasis is common in the Northern Europe and North Atlantic region.¹¹ In USA, its prevalence in white and black people is 2.5% and 1.3% respectively.¹² It is low in certain ethnic groups of Asia.^{13,14} On the basis of the study findings of Kalam et al.⁸ and Bhuyan et al.¹⁵ prevalence of psoriasis were 1.13% and 0.7% in Bangladesh respectively.

There is limited number of research work done on the prevalence of psoriasis in Bangladesh.

The objective of this study was to assess the prevalence of psoriasis in the Sirajganj district of Bangladesh.

METHODS

This cross-sectional descriptive study was carried out in the Department of Dermatology and Venereology of North Bengal Medical College and Hospital, Sirajganj, Bangladesh, during the period of September, 2020 to August, 2021. A total of 2194 patients were visited in outpatient department during the study period. Out of them total 36 psoriasis patients were included in this study on the basis of selection criteria. All patients with psoriasis irrespective of age and sex were included for this study. A careful history was taken from each patient regarding the presence of chronic inflammatory diseases or other dermatoses. Majority of the patients were diagnosed clinically and few selected patients were diagnosed after histopathological investigation. Data were collected by structured questionnaire. Informed written consent was taken from each study subject. Statistical analysis was performed with Statistical package of social science (SPSS) windows version 20. Chi-square test and other statistical analyses were done to employ appropriate interpretations of the findings. *P*-values of <0.05 were considered statistically significant.

RESULTS

During the study period, common dermatological disorders were dermatophytosis (380, 17.3%) and acne vulgaris (352, 16.1%). Prevalence of psoriasis was 1.6% among all the patients (Table I). The mean age of psoriasis patient was 33.69±13.80 years.

Table I: Distribution of dermatological diseases among the patients (n-2194)

Dermatological conditions	Frequency	Percentage (%)
Dematophytosis	380	17.3%
Acne Vulgaris	352	16.1%
Seborrheic dermatitis	138	6.3%
Dermatitis	111	5.1%
Scabies	104	4.7%
Psoriasis	36	1.6%
Ptyriasisrosea	09	0.4%
Lichenplanus	06	0.3%
Others	1058	48.2%
Total	2194	100%

Maximum patients of psoriasis were in 21 to 40 years of age group (15, 41.7%) and males (26,

72.2%) were worst victim of psoriasis. Regarding occupational status, farmer and students was

common patient of psoriasis (Table II). There was no significant relation of psoriasis with age and

occupation but significantly ($p=0.000094$) related with gender.

Table II: Demographic characteristics of the study subjects (n-36)

Variables	No. of patients		χ^2	p-value
Age in years	With psoriasis (%)	Without psoriasis (%)		
0-20	05 (13.9%)	431 (19.9%)	3.8531	0.27 ^{ns}
21-40	15 (41.7%)	1077 (49.9%)		
41-60	14 (38.9%)	540 (25.1%)		
Above 60	02 (5.5%)	110 (5.1%)		
Total	36 (100%)	2158 (100%)		
Sex				
Male	26 (72.2%)	863 (39.9%)	15.263	0.000094 ^s
Female	10 (27.8%)	1295 (60.1%)		
Total	36 (100%)	2158 (100%)		
Occupation				
Farmer	8(22.2%)	408 (18.9%)	7.67	0.17 ^{ns}
Student	7 (19.4%)	462 (21.5%)		
Businessman	6 (16.7%)	196 (9.1%)		
Service holder	5 (13.9%)	171 (7.9%)		
House wife	4 (11.1%)	598 (27.7%)		
Others	6 (16.7%)	323 (14.9%)		
Total	36 (100%)	2158 (100%)		

*ns-not significant, *s-significant

Most of the psoriasis patients were belongs to Sirajganj Sadar and Kamarkhanda Upazila but there were no patients from Shazadpur, Kazipur and Tarash Upazila (Table III).

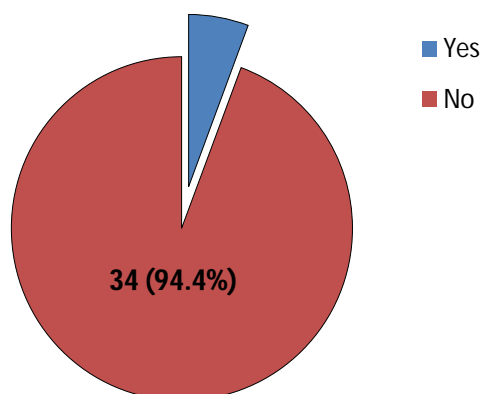
Table III: Distribution of the psoriasis patients according to location (n-36)

Different Upazila	No. of patients	Percentage (%)
Sirajganj Sadar	16	44.4%
Kamarkhanda	8	22.2%
Belkuchi	4	11.1%
Ullapara	4	11.1%
Chouhali	2	5.6%
Raiganj	2	5.6%
Shahjadpur	0	0.0%
Kazipur	0	0.0%
Tarash	0	0.0%
Total	36	100%

Among the psoriasis patient, 22.2% had DM and 13.9% had HTN (Table IV).

Table IV: Comorbidities of psoriasis (n-36)

Variables	No. of patients	Percentage (%)
Comorbidities		
DM	8	22.2%
HTN	5	13.9%
None	23	63.9%
Total	36	100%

**Figure 1: Family history of psoriasis (n-36)**

Out of 36 patients, only 2 (5.6%) had positive family history of psoriasis (Figure 1). In this study, most common type of psoriasis was plaque psoriasis (29, 80.5%) but scalp and erythrodermic psoriasis was less common (Table V).

Table V: Types of psoriasis (n-36)

Types of psoriasis	No. of patients	Percentage (%)
Plaque psoriasis	29	80.5%
Nail psoriasis	3	8.3%
Guttate psoriasis	2	5.6%
Scalp psoriasis	1	2.8%
Erythrodermic psoriasis	1	2.8%
Total	36	100%

DISCUSSION

Psoriasis is a chronic and immune-mediated inflammatory skin disease. This study demonstrated that prevalence of psoriasis among

the dermatological disorders in a tertiary care medical college Hospital of Bangladesh.

This study showed the prevalence of psoriasis was 1.6%. Therefore, the findings of the study are

in well agreement with the findings of Fernández-Armenteros et al.¹⁶ (1.72%) and Ferrándiz et al.¹⁷ (2.31%). Previous study in Bangladesh reported the prevalence of psoriasis was 0.7%.¹⁵ There are other European studies that evaluated the prevalence of psoriasis through databases such as those of Springate et. al.¹⁸ in the United Kingdom and Radtke et. al.¹⁹ in Germany, with a prevalence of 2.8% and 2.78% respectively. Highest prevalence of psoriasis is in Scandinavian countries, like Norway (11.4%).¹¹

The prevalence of psoriasis in different geographical areas widely differs due to environmental, nutritional and genetic variation.²⁰ Psoriasis is comparatively less frequent among the black population, followed by Asian.²¹

In this study, psoriasis was more common among the age group of 21-40 years and mean age was 33.69±13.80 years. Age variation is not statistically significant (p=0.27) with the prevalence of psoriasis. This findings is consistent with other studies.^{15,22} There were two peaks in the age of onset: First and fourth decades of life.²³

Psoriasis was common in male then female and male female ratio was 2.6:1. Psoriasis was significantly (p=0.000094) related with Gender variation. Male preponderance of psoriasis was found in other studies conducted by Bhuiyan et al.¹⁵ Sikder et al.²² and Shao et al.²⁴ They found male patients were 55.1%, 61.2% and 67.5% respectively. It may be equal among male and female genders.²⁵

Psoriasis was common among farmers it may be due to stress and smoking. Initiation and adverse progress of psoriasis is associated with smoking.²⁶

Maximum patient of psoriasis were from Sirajganj sadar upazila because this study was conducted at tertiary care hospital which is situated in sadar upazila of sirajganj district. There were no patients from Shahzadpur, Kazipur and Tarash upazila possibly due to long distance.

Regarding comorbidities, diabetes mellitus and hypertension were present in 22.2% and 13.9% of cases respectively. Similar study conducted by Singh et al.²⁷ reported 18% psoriasis patients were Diabetic and 13.3% were hypertensive. This study revealed, 5.6% patient had positive family history of psoriasis. Kalam et al.⁸ found positive family history in 6.45% cases.

In this study, common type of psoriasis was plaque type (80.5%) followed by nail (8.3%) and guttate type (5.6%). Bhuiyan et al.¹⁵ reported similar finding that, plaque type psoriasis was 81.3% of patients. Another study conducted by Kaur et al.²⁸ where plaque psoriasis was 93%. The actual reason of this plaque type of psoriasis is unknown but considers autoimmune factor may be related.

CONCLUSION

This study concludes, psoriasis is more prevalent in males and plaque psoriasis is common. This result can be used as a reference value for the prevalence of psoriasis in Bangladesh as well as helpful for the diagnosis and treatment of the patients.

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Conflict of interest: None

REFERENCES

1. Fry L. Psoriasis. *Br J Dermatol.* 1988; 119: 445-461.
2. De Rosa G, Mignogna C. The histopathology of psoriasis. *Reumatismo.* 2007; 59(1): 46-48.
3. Kim WB, Jerome D, Yeung J. Diagnosis and management of psoriasis. *Can Fam Physician.* 2017; 63(4): 278-285. PMID: 28404701; PMCID: PMC5389757.
4. Li J, Yu M, Wang Y, Zhang J, Ju M, Chen K. Prevalence of psoriasis and associated risk factors in China: protocol of a nationwide, population-based, cross-sectional study. *BMJ Open.* 2019; 9: 1-5. doi:10.1136/bmjopen-2018-027685.
5. Griffiths CE, Barker JN. Pathogenesis and clinical features of psoriasis. *Lancet.* 2007; 370: 263-271.
6. Nestle FO, Kaplan DH, Barker J. Psoriasis. *N Engl J Med.* 2009; 361: 496-509.
7. Christophers E, Mrowietz U. Psoriasis: Epidermis: Disorders of persistent inflammation, cell kinetics, and differentiation. In: Freedberg IM, Eisen AZ, Wolff K, Austen KF, Goldsmith LA, Katz SI, editors. *Fitzpatrick's Dermatology in General Medicine.* 6th ed., Vol. 1. New York: The McGraw-Hill Companies, Inc.; 2003. p. 407-426.

8. Kalam AM, Islam KA, Akber EB, Jahan I. Prevalence, Clinical Pattern and Presentations of Psoriasis in A Tertiary Care Hospital of Bangladesh. *Cent Med Coll J.* 2021; 5(2): 102-105.
9. Michalek IM, Loring B, John SM. A systematic review of worldwide epidemiology of psoriasis. *J Eur Acad Dermatol Venereol.* 2017; 31(2): 205.
10. Parisi R, Symmons DP, Griffiths CE, Ashcroft DM. Identification and Management of Psoriasis and Associated Comorbidity (IMPACT) project team Global epidemiology of psoriasis: a systematic review of incidence and prevalence. *J Invest Dermatol.* 2013; 133(2): 377-385.
11. Danielsen K, Olsen AO, Wilsgaard T, Furberg AS. Is the prevalence of psoriasis increasing? A 30-year follow-up of a population-based cohort. *Br J Dermatol.* 2013; 168: 1303-1310.
12. Gelfand JM, Stern RS, Nijsten T, Feldman SR, Thomas J, Kist J, et al. The prevalence of psoriasis in African Americans: Results from a population-based study. *J Am Acad Dermatol.* 2005; 52: 23-26.
13. Raychaudhuri SP, Farber EM. The prevalence of psoriasis in the world. *J Eur Acad Dermatol Venereol.* 2001; 15: 16-17.
14. Chen G-Y, Cheng Y-W, Wang C-Y, Hsu TJ, Hsu MM-L, Yang P-T, et al. Prevalence of skin diseases among school children in Magong, Penghu, Taiwan: a community based clinical survey. *J Formos Med Assoc.* 2008; 107(1): 21-29.
15. Bhuiyan MSI, Sikder MS, Sultana A, Mahmud M, Nandy AK, Haque MA. Prevalence of psoriasis in Bangladesh: A community based survey. *J Pak Assoc Dermatol.* 2020; 30(1): 39-45.
16. Fernández-Armenteros JM, Gómez-Arbonés X, Buti-Solé M, Betriu-Bars A, Sanmartin-Novell V, Ortega-Bravo M, et al. Epidemiology of Psoriasis. A Population-Based Study. *Actas Dermosifiliogr.* 2019; 110(5): 385-392. doi: 10.1016/j.ad.2018.10.015. PMID: 30587329.
17. Ferrándiz C, Carrascosa JM, Toro M. Prevalence of psoriasis in Spain in the age of biologics. *Actas Dermosifiliogr.* 2014; 105(5): 504-509. doi: 10.1016/j.ad.2013.12.008. PMID: 24569109.
18. Springate DA, Parisi R, Kontopantelis E, Reeves D, Griffiths CE, Ashcroft DM. Incidence, prevalence and mortality of patients with psoriasis: a U.K. population-based cohort study. *Br J Dermatol.* 2017; 176(3): 650-658. doi: 10.1111/bjd.15021. PMID: 27579733; PMCID: PMC5363241.
19. Radtke MA, Schäfer I, Glaeske G, Jacobi A, Augustin M. Prevalence and comorbidities in adults with psoriasis compared to atopic eczema. *J Eur Acad Dermatol Venereol.* 2017; 31(1): 151-157. doi: 10.1111/jdv.13813. PMID: 27521212.
20. World Health Organization. Global report on psoriasis. [accessed on April 16, 2019]. Available from: http://www.apps.who.int/iris/bitstream/10665/204417/1/9789241565189_eng.pdf.
21. Chandran V, Raychaudhuri SP. Geo epidemiology and environmental factors of psoriasis and psoriatic arthritis. *J Autoimmun.* 2010; 34(3): 314-321.
22. Sikder MS, Bhuiyan MSI, Haque SMM, Islam KA, Alam SMK. Plasma alpha-2 macroglobulin level in moderate to severe psoriasis. *Bangabandhu Sheikh Mujib Med Univ J.* 2017; 10(4): 246-248. doi: org/10.3329/bsmmuj.v10i4.34150.
23. Gelfand JM, Weinstein R, Porter SB, Neimann AL, Berlin JA, Margolis DJ. Prevalence and treatment of psoriasis in the United Kingdom: A population-based study. *Arch Dermatol.* 2005; 141: 1537.
24. Shao C, Zhang G, Bao Y, Jiang Z, Han G, Gu H. Epidemiology of psoriasis in China in 1984. *Zhonghua Liu Xing Bing Xue ZaZhi.* 1984; 19: 253-261.
25. Ayanlowo O, Akinkugbe A. Clinical pattern of psoriasis in patients seen at a tertiary hospital in Nigeria. *J Clin Sci.* 2016; 13: 13742.
26. Naldi L. Psoriasis and smoking: links and risks. *Psoriasis (Auckl).* 2016; 6: 65-71.
27. Singh R, Roy PK. A Clinicoepidemiological Study of Psoriasis and its Association with Metabolic Syndrome. *J Clin Dermatol Ther.* 2020; 6(1): 1-7. doi: 10.24966/CDT-8771/100049.
28. Kaur I, Handa S, Kumar B. Natural history of psoriasis: a study from the Indian subcontinent. *J Dermatol.* 1997; 24(4): 230-234. doi: 10.1111/j.1346-8138.1997.tb02779.x. PMID: 9164063.

Surgical Treatment of Diabetic foot infection in a Tertiary Care Hospital of Bangladesh

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ABSTRACT

Introduction: Diabetes Mellitus (DM) is a common metabolic disorder in Bangladesh. Diabetic patients are at increased risk of infection and ulceration. Diabetic foot infection occurs secondary to neuropathy, micro-vascular changes and impaired resistance to infection. It is not only associated with high morbidity and disability but also a great economic burden for the family and society. The aim of this study was to determine the demography of patients with diabetic foot infection as well as to explore the different surgical intervention. **Methods:** This cross-sectional type of descriptive study was carried out in the General surgery and Orthopaedic department of North Bengal Medical College Hospital, Sirajganj, Bangladesh from January, 2018 to December, 2020. Among the total (n-622) admitted diabetic patients, 296 patients with foot infection were enrolled for this study on the basis of selection criteria. Data was collected from the patient's register of operation theatre and admitted ward. Collected data was classified, edited, coded and entered into the computer for statistical analysis by using MS EXCEL. **Results:** Among total 622 diabetic patients, foot infected patients were 296 (47.58%). Diabetic foot infection was common in male (166, 56.08%) gender and majority (138, 46.62%) were in 51-70 years of age group. Maximum patients were managed by wound debridement (123, 41.6%) whereas major amputation was done in 13 (4.4%) cases. Most of the patients discharged from hospital within 1 to 10 days of surgical intervention and single operation was done in 227 (76.7%) cases. **Conclusion:** Foot infection is common in diabetic patients. Therefore, quick and efficient surgical treatment of diabetic foot infection is essential for both patient care and the avoidance of recurrent ulcers.

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INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder of endocrine system. The incidence of diabetes is rising day by day. In 2015, 415 million people had diabetes globally which was about 10% of the total adult population. This figure may reach up to 642 million by 2040.¹ In India, in 2017 an estimated 54.4 million (7.6%) people of working age had diabetes. Each year over seven lacs new patients are diagnosed; 12000 to 14000 of which are children, teenagers and young adults.² This life threatening disease can be controlled but still there is no cure.³

Prevalence of DM among rural and semi-urban regions was ranging between 7% to 20.3%.^{4,5} Patients with poorly controlled diabetes are prone to diabetic complications and increasing number of diabetic related microvascular and macrovascular complications.^{6,7} A Malaysian study in 2011 found that, 47% of the patients with diabetes suffered from diabetic foot complications.⁷ For better management of diabetic foot infection needs close monitoring and frequent follow-up. Otherwise there is possibility of economical inactivity. Diabetes is a major social and financial burden on health care facilities in all countries. In 2015, Diabetes caused five million death globally and estimated total healthcare expenditure of 12%.¹

Bangladesh has the largest diabetes prevalence among all nations, with a total population of more than 160 million.⁸ The international diabetes federation (IDF) estimated 8.4 million people with diabetes in Bangladesh and almost an equal number with undetected diabetes.⁸ In Diabetic patients, foot problems occur secondary to neuropathy, micro-vascular changes and impaired resistance to infection. Diabetic patients are also at increased risk of infection and ulceration. Following ulceration, may lead to major morbidity and amputation. Diabetic ulcers need to be treated promptly. After admission,

patients need urgent clinical and radiological assessment and also optimal management.⁹ The extend of tissue loss might be a reason to consider a major amputation. If multiple digits are involved or heel necrosis is present, a limb-salvage procedure is unlikely to be successful. A gangrenous forefoot is best treated with a major amputation.

The aim of this study was to determine the demography of patients with diabetic foot infection as well as to explore the different surgical intervention.

METHODS

This cross-sectional type of descriptive study was conducted in the General surgery and Orthopaedic department of North Bengal Medical College Hospital, Sirajganj, Bangladesh from January, 2018 to December, 2020. During this study period total number of admitted diabetic patients was 622. Among them, 296 patients with diabetic foot infection were enrolled for this study but foot infection due to trauma and burger's disease were excluded. Demographic information, length of stay in hospital, admission date, and diagnosis, type of surgical intervention and date of surgical intervention of the patients were obtained from the register book of both surgery and orthopaedic department. Hospital authority was informed about the study and permission was obtained. Detailed information was obtained in each case according to protocol. Collected data was classified, edited, coded and entered into the computer for statistical analysis by using MS EXCEL, p value was obtained from χ^2 test and $p < 0.05$ was considered statistically significant.

RESULTS

During the study period, among the total 622 diabetic patients, 296 (47.58%) were suffering from diabetic foot infection, those were subsequently underwent surgery (Table I).

Table I: Distribution of diabetic patients on the basis of foot infection (n-622)

Type of diabetic patients	Frequency	Percentage (%)
Diabetic patients with foot infection	296	47.58%
Diabetic patients without foot infection	326	52.42%
Total	622	100%

Out of 296, there were 166 (56.08%) males and 130 (43.92%) females and male: female ratio 1.28:1 (Figure1).

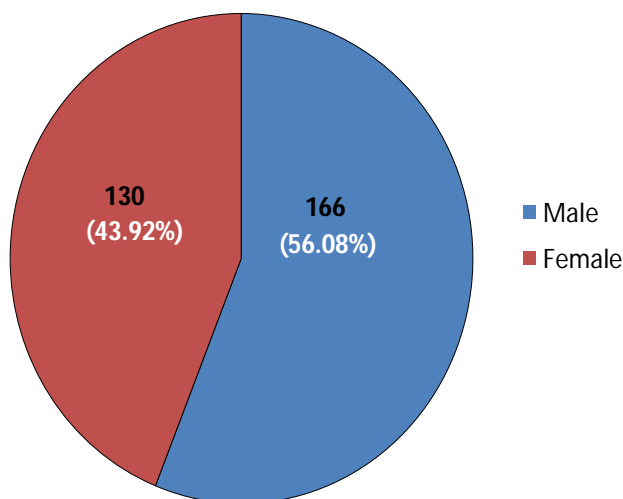


Figure 1: Sex distribution of diabetic patients with foot infection (n-296)

Majority of the diabetic foot infection patients were within 51-70 years of age group (Table II). The youngest patient who underwent surgery for diabetic foot infection was 8 years old and the oldest patient was 97 years old.

Table II: Distribution of diabetic patients according to age group

Age group in year	Diabetic foot infection		p-value
	Yes	No	
≤ 30	14 (4.73%)	12 (3.68%)	0.82594 ^{ns}
31-50	136 (45.95%)	152 (46.63%)	
51-70	138 (46.62%)	150 (46.01%)	
≥ 70	08 (2.70%)	12 (3.68%)	
Total	296 (100%)	326 (100%)	

* χ^2 test –ns (not significant)

Postoperative hospital stay was 1 to 10 days in majority of the patients (207, 69.9%) and the longest stay was >50 days in two cases (Table III).

Table III: Length of hospital stays after operation

Hospital stay (in days)	Frequency	Percentage (%)
1-10	207	69.9%
11-20	63	21.3%
21-30	20	6.8%
31-40	01	0.3%
41-50	03	01%
>50	02	0.7%
Total	296	100%

Out of 296 patients, wound debridement surgery was performed in 123 (41.6%) patients to manage diabetic foot infection followed by incision and drainage in 82(27.7%) and rest of the patients were managed by different types of amputation. Above and below the knee amputation was considered as major amputation which was done in only 13 (4.4%) cases (Table IV).

Table IV: Different types of surgical procedure performed in patients (n-296)

Name of surgery	No of patient	Percentage (%)
Wound debridement	123	41.6%
Incision and drainage	82	27.7%
Amputations of the digits	66	22.3%
Transmetatarsal amputation	17	5.7%
Below knee amputation	10	3.4%
Syme's amputation	4	1.4%
Above knee amputation	3	1%
Chopart amputation	2	0.7%
Lisfrance amputation	2	0.7%
Boyd's amputation	1	0.3%
Pirogofit amputation	1	0.3%

***Multiple response**

Single operation was done in most of the cases (227, 76.7%) but multiple operations were done in 69 (23.3%) cases (Table V).

Table V: Distribution of patients according to number of surgery

Number of surgery	Frequency	Percentage (%)
Single	227	76.7%
Multiple	69	23.3%
Total	296	100%

DISCUSSION

Diabetic foot infection is a bone or soft tissue infection of foot caused by uncontrolled Diabetes Mellitus (DM). It is one of the main causes of morbidity and disability among diabetic patients. A study showed that patients with diabetic foot complications had severely impaired quality of life both mentally and physically.¹⁰ In addition, the treatment of diabetic foot infection is complicated where required more time and resources.

In this study, male patients (166, 56.08%) were more than female (130, 43.92%). Wui et al.¹¹ showed that, there were 355 (59.66%) males and 250(40.34%) females. Males are more prone to develop diabetic foot infection due multiple causes like diabetic neuropathy, smoking, stress, poor glycaemic control and peripheral vascular diseases etc.

In this study, the minimum age of the patient was 8 years and maximum age was 97 years, among them the majority surgical intervention was performed between the age group 51-70 years. This finding is consistent with the finding of

Mazlina et al.¹² They observed maximum patients were in between the age group of 51 to 60 years and youngest and oldest patients were 18 and 98 years respectively. Diabetic foot infection is common in elderly patients due to peripheral neuropathy, foot deformities and peripheral arterial disease etc.

Kool et al.¹³ reported most frequent (76.10%) duration of hospital stay was around 10 days and maximum duration was 159 days. This result is almost similar with our study. The duration of hospital stay differs due to the different rehabilitation protocol and postoperative physiotherapy.

In this study, most common surgery was wound debridement (123, 41.55%) and major amputations were done in 13(4.4%) cases from 2018 to 2020. Hazmy et al.¹⁴ reported 186 cases of major amputations of the lower limb due to diabetic ulcers or gangrene for the period from 1997 to 1999 in Seremban Hospital, Malaysia. Yusof et al.¹⁵ reported 67 cases of major amputations due to diabetic foot complications from 2013 to 2015 in Hospital University Sains

Malaysia. The more incidences of major amputations in these studies^{14,15} were due to lack of awareness regarding diabetic foot care, uncontrolled diabetes and late presentation. Major amputation was less incident in our study, may be due to limited number of complicated cases. Ugwu et al.¹⁶ reported that 79% of the patients with diabetic foot ulcer had advanced stage ulcers (Wagner grades >3) and majority of the ulcers were infected at the time of admission. Diabetic foot ulcers were not only associated with uncontrolled DM but also other comorbidities like atherosclerosis, neuropathy etc.¹⁷⁻²⁰

Multiple surgical procedure was performed in 69(23.3%) of cases in this study. Wui et al.¹¹ reported 241(40.50%) cases were managed by multiple surgical procedures. This is likely due to emergency life saving surgeries were done at admission and later definitive surgery was done after haemodynamic stable condition.

The clinical condition and staging of the diabetic foot infection was not mentioned in this study as there was no clinical record in the registry. We believe that this study can be further improved by using a standardized staging tool to describe the condition of diabetic foot prior to surgical intervention.

CONCLUSION

Foot infection is common in diabetic patients. Successful outcomes of surgery require a multidisciplinary team approach to manage properly. All initial stage of diabetic patients may be treated in more aggressive approach to avoid devastating complications.

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REFERENCES

1. Pearson ER, Mc Crimmon RJ. Diabetes mellitus. In: Ralston SH, Penman ID, Strachan MWJ, Hobson RP, editors. Davidson's Principles and practice of Medicine. 23rd ed. Edinburgh: Elsevier Ltd; 2018.p.719-762.

2. Zomer E, Banker KK, Liew D, Ademi Z. The impact of diabetes on productivity in India. *Diabetes care*. 2021; 44(12): 2714-2722. doi: 10.2337/dc21-092.
3. Benjamin A, Lipsky, MD, Roger E. Outpatient management of uncomplicated lower-extremity infection in diabetic patients. *Arch Intern Med*. 1990; 150(4): 790-797. doi:10.1001/archinte.00390160058013.
4. Mustaffa BE. Diabetes epidemic in Malaysia. *Med J Malaysia*. 2004; 59(3): 295-296.
5. Mohamed M, Winn T, Rampal GL, Rashid AA, Mustaffa BE. A preliminary result of the cardiovascular risk factors intervention study (Pikom study): Diabetes mellitus, hypertension and their associated factors. *Malays J Med Sci*. 2005; 12(1): 20-25. doi: 10.21315/mjms.
6. Mustaffa BE, Wan Mohamad WB, Chan SP, Rokiah P, Mafauzy M, Kumari S, et al. The current status of diabetes management in Malaysia. *J ASEAN Fed Endocr Soc*. 1998; 16(2): 1-13.
7. Mafauzy M, Hussein Z, Chan SP. The status of diabetes control in Malaysia: results of Diab Care 2008. *Med J Malaysia*. 2011; 66(3): 175-181.
8. Whiting DR, Guariguata L, Weil C, Shaw J. Global estimates of the prevalence of diabetes for 2011 and 2030. *IDF Diabetes Atlas*. 2011; 94(3): 311-321. <https://doi.org/10.1016/j.diabres.2011.10.029>.
9. Sharp B. Foot and Ankle. In: Williams SN, O'Connell PR, McCaskie AW, editors. *Bailey & Love's Short Practice of Surgery*. 27th ed. Boca Raton, FL: CRC Press; 2018.p. 524-533.
10. Gemechu FW, Seemant F, Curley CA. Diabetic foot infections. *Am Fam Physician*. 2013; 88(3): 177-184. PMID: 23939696.
11. Wui NB, Ahmad MF, Syafiq M. Diabetic foot infection and surgical treatment in a secondary health care centre in Malaysia. *Med J Malaysia*. 2020; 75(1): 29-32.
12. Mazlina M, Shamsul AS, Jeffery FA. Health-related quality of life in patients with diabetic foot problems in Malaysia. *Med J Malaysia*. 2011; 66(3): 234-238

13. Kool B, Ipil M, McCool J. Diabetes Mellitus-related Foot Surgeries in the Republic of the Marshall Islands in Micronesia. *Hawaii J Med Public Health*. 2019; 78(1): 13-18. PMID: 30697470.
14. Hazmy W, Mahamud M, Ashikin N, Jamilah S, Yee LE, Shong HK. Major limb amputations in Seremban Hospital: a review of 204 cases from 1997-1999. *Med J Malaysia*. 2001; 56(Suppl) C: 3-7. PMID: 11814245.
15. Yusof MI, Sulaiman AR, Muslim DA. Diabetic foot complications: a two-year review of limb amputation in a Kelantanese population. *Singapore Med J*. 2007; 48(8):729-732. PMID: 17657379.
16. Ugwu E, Adeleye O, Gezawa I, Okpe I, Enamino M, Ezeani I. Burden of diabetic foot ulcer in Nigeria: Current evidence from the multicenter evaluation of diabetic foot ulcer in Nigeria. *World J Diabetes*. 2019; 10(3): 200-211. doi: 10.4239/wjd.v10.i3.200.
17. Nather A, Wong KL. Distal amputations for the diabetic foot. *Diabet Foot Ankle*. 2013; 4(1): 212-288. doi: 10.3402/dfa.v4i0.21288.
18. Steffen C, O'rourke S. Surgical management of diabetic foot complications: the Far North Queensland profile. *Aust N Z J Surg*. 1998; 68(4): 258-260.
19. Garcia-Morales E, Lazaro-Martinez JL, Martinez-Hernandez D, Aragón-Sánchez J, Beneit-Montesinos JV, González-Jurado MA. Impact of diabetic foot related complications on the Health Related Quality of Life (HRQoL) of patients-a regional study in Spain. *Int J Low Extrem Wounds*. 2011; 10(1): 6-11. doi: 10.1177/1534734611400257.
20. Sinha R, Heuvel WJ, Arokiasamy P. Factors affecting quality of life in lower limb amputees. *Prosthet Orthot Int*. 2011; 35(1): 90-96. doi: 10.1177/0309364610397087.

Sociodemographic Risk Factors of Community Acquired Pneumonia Among Under Five Children in Rajshahi Medical College Hospital

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ABSTRACT

Introduction: Community acquired pneumonia (CAP) refers to an acute infection of lung parenchyma acquired outside the hospital. It is an important cause of morbidity and mortality of children in developing countries. This study was under taken to find out the socio-demographic risk factors of CAP among under-five children. **Methods:** This cross-sectional type of descriptive study was conducted from January, 2017 to December, 2018 among the under-five children (2 to 59 months) in the department of Pediatrics and Expanded Program on Immunization (EPI) center of Rajshahi Medical College Hospital. A total of 123 patients with CAP (case) and 123 healthy children (control) were enrolled purposively for this study. Data was collected by face-to-face interview with a predesigned questionnaire containing all the variables of interest. Clinical examinations and relevant investigations of the patients were recorded. At the end, data were processed and analyzed by computer using SPSS software version-20. *p* value was obtained from X^2 test and $p < 0.05$ was considered statistically significant. **Results:** Among the 123 patients, most (77, 62.60%) of the cases were within 2 to <12 months of age and majority (82, 66.67%) were male. Regarding housing status, maximum patients lived in mud houses (59, 47.97%) with improper ventilation (73, 59.35%) and in overcrowding situation. They were used to smoked producing cookers (100, 81.30%). Most of the patients were from lower class family (99, 80.49%) and their parents were illiterate. **Conclusion:** CAP could be reduced by improving the socioeconomic status and living conditions of families. This includes the provision of adequate ventilation, avoiding overcrowding and use of firewood should be discouraged.

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INTRODUCTION

Community acquired pneumonia (CAP) is a lower respiratory tract illness that affects children who have not spent the previous 14 days in a hospital or other healthcare facilities.¹ CAP is an important cause of morbidity as well as mortality of children in developing

countries.² Over the last two decades, children deaths have declined globally from 12.6 million to 6.6 million but still CAP has remained the world's leading cause of death among children under five years of age.^{3,4}

Globally, pneumonia contributes 16% of the total 5.6 million deaths of children under five and

>95% of which are observed in developing countries.⁵ Most of the deaths occur in India, Nigeria, Pakistan, Democratic Republic of Congo, Ethiopia, China, Angola, Indonesia, Bangladesh and the United Republic of Tanzania.⁶ Children of low income countries are at 18 times greater risk of death due to pneumonia and other acute infection than children of developed countries.⁷ In Bangladesh, the highest incidence rate of CAP cases for children less than five years is reported at 0.51 episodes/child-year.⁸ CAP accounted for 26% of neonatal deaths leading to high Infant Mortality Rate (IMR) in Bangladesh.⁸ Among the all identified cases of CAP, 10% require hospitalization.^{9,10}

Children living in rural areas with acute poverty and malnutrition are the most vulnerable to pneumonia.¹¹ In general, the limited access of less privileged families to the healthcare services means that, they delay seeking adequate care. As a result, the deterioration of their condition and an increased risk of hospitalization.^{12,13} Reduction of all causes of children mortality occurred between 2000 and 2011 worldwide. CAP was estimated to account for more than one million children deaths and 80% of which occurred in children under two years of age.¹⁰ Parents educational level, particularly maternal education is inversely related to morbidity and mortality of childhood pneumonia.^{14,15} There is evidence of a link between poor socioeconomic status and pneumonia in children.¹⁶

So, this study was under taken to assess the socio-demographic risk factors of community acquired pneumonia among under five children

(2-59 months' children) attending at Pediatrics department and Expanded Program on Immunization (EPI) center of Rajshahi Medical College Hospital, Rajshahi, Bangladesh.

METHODS

This hospital based cross sectional type of descriptive study was conducted among the under-five children (2-59 months) from January, 2017 to December, 2018 in the department of Pediatrics and EPI center of Rajshahi Medical College Hospital (RMCH), Rajshahi. A number of 123 children suffering from CAP were selected as cases and 123 healthy children were selected as control purposively. Hospital acquired pneumonia and other respiratory illness were excluded from this study. Study approval was taken from the Ethical Review Committee (ERC) of RMCH and informed written consent was taken from the guardian of study subjects. Data was collected by face to face interview with a predesigned questionnaire containing all the variables of interest. Clinical examinations and relevant investigations of the patients were recorded. At the end, data were processed and analyzed by computer using SPSS software version-20. *P value* was obtained from χ^2 test and $p < 0.05$ was considered statistically significant.

RESULTS

Figure 1 showed that, Maximum patients (77, 62.60%) were in 2 to <12 months of age group whereas in control group, majority (64, 52.03%) were in 12 to 59 months of age.

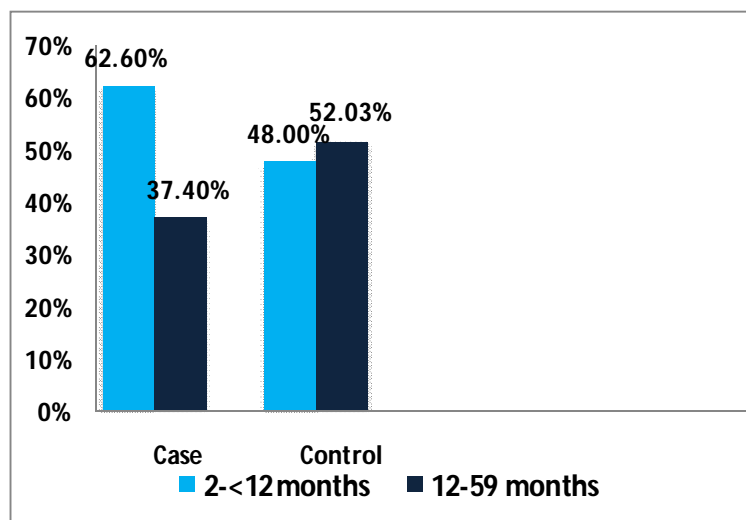


Figure 1: Distribution of cases and controls according to age groups (n-123 in each group)

Out of 123 patients, 82 (66.67%) were male and among the control group, 73 (59.35%) were male (Figure 2).

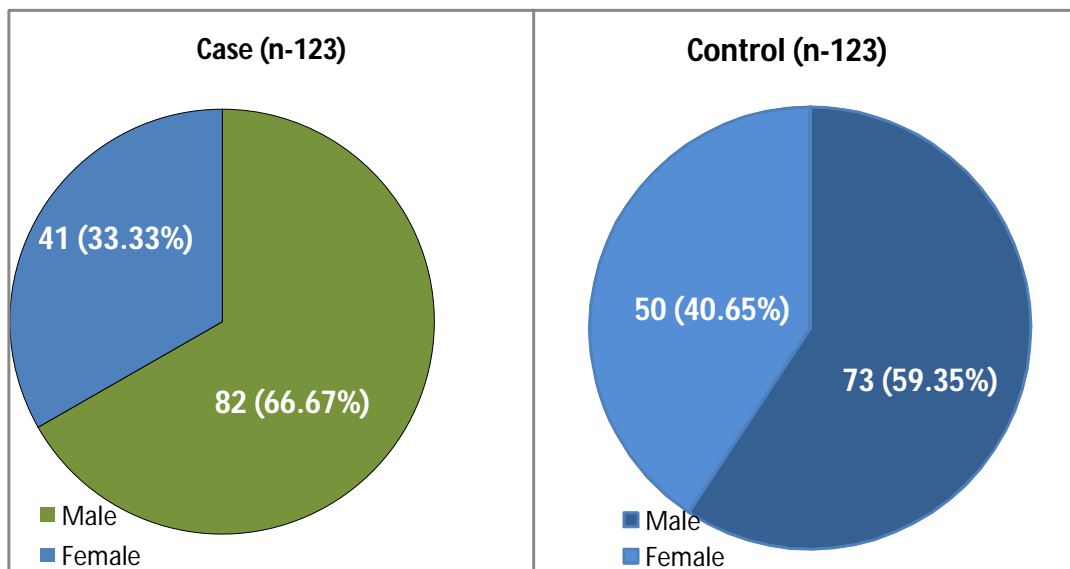


Figure 2: Gender distribution of the children (n-123 in each group)

Regarding housing condition and ventilation, most (59, 47.97%) of the patients were lived in mud/bamboo houses with improper ventilation facilities (73, 59.35%). Living in overcrowded area and cooking in smoked cooker were commonly observed among the patient’s family. Most of the cases and controls were used biomass fuels like firewood and cow dung for cooking in their households. Housing status, ventilation facilities, overcrowding condition and smoked cooker were significantly associated with CAP (Table I).

Table I: Housing status of the study subjects

Variable	Case (n-123)	Control (n-123)	χ^2	p value
Type of housing:				
Mud/bamboo houses	59 (47.97%)	87 (70.73%)	14.02	p-0.0009
Steeled houses	53 (43.09%)	27 (21.95%)		
Bricked houses	11 (8.94%)	9 (7.32%)		
Total	123 (100%)	123 (100%)		
Ventilation of living room:				
Improper ventilation	73 (59.35%)	91 (73.99%)	5.92	p-0.01
Proper ventilation	50 (40.65%)	32 (26.01%)		
Total	123 (100%)	123 (100%)		
Overcrowding:				
Yes	82 (66.67%)	62 (50.41%)	6.69	p-0.009
No	41 (33.33%)	61 (49.59%)		
Total	123 (100%)	123 (100%)		
Condition of cooker:				
Smoked	100 (81.30%)	80 (65.04%)	8.28	p-0.004
Smokeless	23 (18.70%)	43 (34.96%)		
Total	123 (100%)	123 (100%)		

Among the cases, 55 (44.71%) mothers were illiterate and only 9 (7.32%) had higher secondary and above. In control group, 42 (34.15%) mothers were illiterate and only 18 (14.64%) had higher secondary and above (Table II).

Table II: Level of education among the mother's of study subjects

Level of education	Case (n-123)	Control (n-123)	Total (n-246)
Illiterate	55 (44.71%)	42 (34.15%)	97 (39.43%)
Primary	36 (29.27%)	35 (28.45%)	71 (28.86%)
Secondary	23 (18.70%)	28 (22.76%)	51 (20.73%)
Higher Secondary and above	9 (7.32%)	18 (14.64%)	27 (10.98%)
Total	123 (100%)	123 (100%)	246 (100%)

$\chi^2=5.24$, $p=0.154$, not significant

More than half (64, 52.03%) of the fathers were illiterate in case group whereas 30.89% illiterate in controls group. Father's educational level was inversely associated with the risk of CAP (Table III).

Table III: Level of education among the father's of study subjects

Level of education	Case (n-123)	Control (n-123)	Total (n-246)
Illiterate	64 (52.03%)	38 (30.89%)	102 (41.46%)
Primary	27 (21.95%)	30 (24.39%)	57 (23.17%)
Secondary	14 (11.38%)	31 (25.20%)	45 (18.29%)
Higher Secondary and above	18 (14.64%)	24 (19.52%)	42 (17.08)
Total	123 (100%)	123 (100%)	246 (100%)

$\chi^2=14.06$, $p=0.0028$, significant

Most of the cases (99, 80.49%) belonged poor socioeconomic status. A statistically significant association was found between social class and CAP (Table IV).

Table IV: Socio-economic status of the study subjects

Socioeconomic Status	Case (n-123)	Control (n-123)	Total (n-246)
Poor/lower class	99 (80.49%)	67 (54.47%)	167 (67.89%)
Lower middle class	18 (14.63%)	46 (37.40%)	63 (25.60%)
Upper middle class	6 (4.88%)	10 (8.13%)	16 (6.50%)
Total	123 (100%)	123 (100%)	246 (100%)

$\chi^2=20.87$, $p=0.000029$, significant

DISCUSSION

Community-acquired pneumonia (CAP) is the most common childhood illness and its incidence is highest among children less than 5 years old. There are several national and international recommendations regarding the therapy and prevention of pediatric CAP. However, still many significant issues that need to be addressed. This

study revealed the association of the socio-demographic risk factors with CAP.

In this study, most (62.60%) of the CAP patients were under one year of age. Similar findings were observed by Srivastava et al.¹⁷ (61.7%) and Aftab et al.¹⁸ (62.5%). This age group of children are vulnerable to CAP due to less immunity. Male (66.67%) children were more affected with CAP.

It has similarities with the findings of Srivastava et al.¹⁷ Chatterjee¹⁹ and Bari et al.²⁰

Mud houses with improper ventilation facilities were directly linked to pneumonia because of dampness and fluctuations of daily temperature. A study conducted by Sikolia et al.²¹ in Nairobi (Kenya) observed that poor housing conditions of family was associated with increased risk of pneumonia in children. Similar results were reported by Savitha et al.²² In the present study, there was significant ($p < 0.05$) association between type of housing and improper ventilation with CAP.

Overcrowding contributes to the transmission of infection through respiratory droplets. In this study, there was statistically significant association between overcrowding with CAP (p value < 0.05). Overcrowding increases the probability of transmission of infection among family members. This was in agreement with a study conducted by Cardoso et al.²³, where overcrowding was associated with higher (2 to 5 fold) incidence of lower respiratory tract infections ($p < 0.001$). Srivastava et al.¹⁷ also found positive association of pneumonia with overcrowding.

Children living in family with smoked cooker were commonly affected by CAP. Several studies conducted by Savitha et al.²², Bruce et al.²⁴, Smith et al.²⁵ have shown that, indoor air pollution by smoke producing cooker increases the risk of pneumonia. Tazinya et al.²⁶ observed that, development of respiratory tract infection was 2.63 times more in children exposed to wood smoke. Occurrence of CAP in children was significantly associated with the level of father's education. This finding is consistent with the case control study carried out by Victoria et al.²⁷ They observed father's education ($p < 0.0028$) was strongly associated with CAP in children. Children from low socioeconomic group were more prone to develop CAP. This study showed that, low socio-economic status was significant association ($p < 0.05$) with childhood CAP. Generally, a better income would lead to good housing, availability of clean fuel for cooking and health care facilities.

It was a single center study which does not represents the whole country. Admission bias was another limitation of this study.

CONCLUSION

Low socio-economic condition, overcrowding, improper ventilation, use of smoked cooker and patents illiteracy were found to be risk factors for community acquired pneumonia (CAP) in under five children. CAP could be reduced by improving the socioeconomic status.

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REFERENCES

1. Bartlett JG, Dowell SF, Mandell LA. Practice guidelines for the management of community-acquired pneumonia in adults. *Clin Infect Dis.* 2000; 31(2):347-382.
2. Qin Q, Shen KL. Community-acquired pneumonia and its complications. *Indian J Pediatr.* 2015; 82(8): 745-751.
3. Walker CL, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA. Global burden of childhood pneumonia and diarrhea. *Lancet.* 2013; 381: 1405–1416.
4. Wardlaw T, You D, Hug L, Amouzou A, Newby H. UNICEF Report: enormous progress in child survival but greater focus on newborns urgently needed. *Reprod Health.* 2014; 11: 82.
5. UNICEF, Levels & trends in child mortality. Report 2017. New York: The United Nations Children's fund; 2017.
6. UNICEF. Committing to child survival. A promise renewed. Progress report 2015. In: New York: The United Nations Children's fund; 2015.
7. Lozano R, Naghavi M, Foreman K. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2013; 380: 2095–2128.

8. Choudhury SA, Mridha AA, Dewan F. Clinical Profile of Hospitalized Community Acquired Childhood Pneumonia in Dhaka, Bangladesh. *HSOA J Clin Stud Med Case Rep*. 2017; 4(1):1-6.
9. Rudan I, Boschi-Pinto C, Biloglaz Z, Mulholland K, Campbell H. Epidemiology and etiology of childhood pneumonia. *Bull World Health Organ*. 2008; 86:408–416.
10. Nair H, Simões EA, Rudan I, Gessner BD, Azziz-Baumgartner E, Zhang JS. Global and regional burden of hospital admissions for severe acute lower respiratory infections in young children in 2010: a systematic analysis. *Lancet*. 2013; 381: 1380-1390.
11. Williams BG, Gouws E, Boschi-Pinto C, Bryce J, Dye C. Estimates of world-wide distribution of child deaths from acute respiratory infections. *Lancet Infect Dis*. 2002; 2: 25–32.
12. Andrade AL, Silva SA, Martelli CM, Oliveira RM, Morais NOL, SiqueiraJúnior JB. Population-based surveillance of pediatric pneumonia: use of spatial analysis in an urban area of Central Brazil. *Caderons de SaudePublica*. 2004; 20: 411–421.
13. Rudan I, O'Brien KL, Nair H, Liu L, Theodoratou E, Qazi S. Epidemiology and etiology of childhood pneumonia in 2010: estimates of incidence, severe morbidity, mortality, underlying risk factors and causative pathogens for 192 countries. *J Glob Health*. 2013; 3(1): 110-114.
14. Wonodi CB, Deloria-Knoll M, Feikin DR, DeLuca AN, Driscoll AJ, Moisi JC. Evaluation of risk factors for severe pneumonia in children: The Pneumonia Etiology Research for Child Health study. *Clin Infect Dis*. 2012; 54(2): 124–131.
15. Onyango D, Kikvi G, Amukoye E, Omolo J. Risk factors of severe pneumonia among children aged 2-59 months in western Kenya: a case control study. *Pan Afr Med J*. 2012; 13: 45.
16. Fontoura MS, Matutino AR, Silva CC, Santana MC, Nobre-Bastos M, Oliveira F. Differences in evolution of children with non-severe acute lower respiratory tract infection with and without radiographically diagnosed pneumonia. *Indian Pediatr*. 2012; 49: 363–369.
17. Srivastava P, Mishra AK, Roy AK. Predisposing Factors of Community Acquired Pneumonia in Under-Five Children. *J Lung Dis Treat*. 2015; 1(1): 1-4. doi:10.4172/2472-1018.1000101.
18. Aftab S, Ejaz I, Waqar U, Khan HI, Hanif A, Usman A, et al. Risk Factors For Childhood Pneumonia In North Eastern Pakistan: A Case-Control Study. *Malays J Paediatr Child Health*. 2016; 22: 26-34.
19. Chatterjee S. A Study of Epidemiological Factors Related to Acute Respiratory Infection (ARI) In Under Five Children Attending the Immunization Clinic of Calcutta National Medical College and Hospital. *Int J Pulm Med*. 2007; 7: 6.
20. Bari MI, Siddiqu AB, Alam T, Hossain A. Risk Factors of Pneumonia in Children–A Community Survey. *TAJ*. 2007; 20(2): 122-126.
21. Sikolia DN, Mwololo K, Cherop H, Hussein A, Juma M, Kurtii J, et al. The Prevalence of acute respiratory infections and the associated risk factors: a study of children under five years of age in Kibera Lindi Village, Nairobi, Kenya. *Bull National Inst Public Health*. 2002; 51(1): 67-72.
22. Savitha MR, Nandeeshwara SB, Pradeep MJ, Farhan-ul-haq, Raju CK. Modifiable risk factors for acute lower respiratory tract infections. *Indian J Pediatr*. 2007; 74: 477-482.
23. Cardoso MR, Cousens SN, Goes Siqueira L, Alves FM, D'Angelo L. Crowding: risk factor or protective factor for lower respiratory disease in young children? *BMC Public Health*. 2004; 4:19.
24. Bruce N, Perez PR, Albalak R. Indoor air pollution in developing countries: A major environmental and public health challenge. *Bull World Health Org*. 2000;78: 1078-1092.
25. Smith KR, Samet JM, Romieu I, Bruce N. Indoor air pollution in developing countries and acute lower respiratory infections in children. *Thorax*. 2000; 55: 518–532.
26. Tazinya AA, Halle-Ekane GE, Mbuagbaw LT, Abanda M, Atashili J, Obama MT. Risk factors for acute respiratory infections in children under five years attending the Bamenda Regional Hospital in Cameroon. *BMC Pulm Med*. 2018;18:7. doi: 10.1186/s12890-018-0579-7.
27. Victoria CG, Fuchs SC, Flores JA, Fonseca W, Kirkwood B. Risk factors for pneumonia among children in a Brazilian metropolitan area. *Pediatr*. 1994; 93: 977–985.

Chilaiditi Syndrome: A Rare Surgical Condition

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ABSTRACT

Chilaiditi syndrome (CS) is a rare surgical condition where there is an interposition of the colon between the liver and the abdominal wall leading to clinical symptoms. Chilaiditi sign is an occasional radiologic finding where colonic interposition occurs between the diaphragm and the liver, but it is usually asymptomatic and discovered incidentally as pseudopneumoperitoneum. Here we report a rare case of CS. A 52 years old female patient was admitted in the department of surgery, North Bengal Medical College Hospital, Sirajganj, Bangladesh, with the complaints of abdominal pain, epigastric fullness, abdominal lump right to the umbilicus and weight loss. She was anxious but well oriented, mildly anemic and dehydrated. On abdominal examination, there is an ill-defined, soft, cystic, mobile intra abdominal lump occupying right to the umbilicus. Upper border of liver dullness is obliterated but bowel sound was present. Abdominal ultrasound showed, a large hypoechoic mass measuring about 6x7 cm in size. Plain X-ray abdomen showed pseudo-pneumoperitoneum. CT scan showed interposition of transverse colon is in between right dome of the diaphragm and liver, thickening of gastric mucosa along the fundus and greater curvature. Upper G.I endoscopy and biopsy revealed chronic non specific ulcer. After adequate resuscitation, laparotomy was done. Biopsy was taken from peri-gastric lymph nodes following right hemi-colectomy and ileo-transverse anastomosis.

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INTRODUCTION

Chilaiditi syndrome (CS) is an uncommon disease where there is an interposition of the colon between the liver and the abdominal wall leading to clinical symptoms.¹ Predominantly affects older males and male: female ratio of 4:1.² It is a rare radiologic finding and usually asymptomatic which is discovered incidentally as pseudo-pneumoperitoneum. So, CS is the surgical condition in which a chilaiditi

sign is accompanied by clinical symptoms and signs.

Demetrius chilaiditi (1883-1975) a Greek radiologist who described the radiographic findings in 1970 while working in Vienna, Austria. However, the first description of the interposition of colon between the liver and the right hemidiaphragm was published by Cantini in 1865.³ Usually hepatic flexure of the colon interposed but portion of small intestine maybe implicated in few cases.⁴ The incidence of CS is

0.025 to 0.28% and common in males with the median age of 60 years.⁵

Intestinal, hepatic, and or diaphragmatic etiologies contribute to the pathogenesis of chilaiditi sign and syndrome. It may be congenital or acquired. The congenital anatomic variations can include the absence, laxity, or elongation of the suspensory ligaments or the falciform ligament of the liver or congenital malpositions. The anatomic distortions can also result from functional disorders such as chronic constipation, cirrhosis, paralysis of the right diaphragm, chronic lung disease, multiple pregnancies, ascites and obesity.^{5,6} Abdominal pain, constipation, anorexia, vomiting, chest pain and respiratory distress are common presentation which are ranging from chronic intermittent to acute severe. Intestinal obstruction, volvulus, intussusception, appendicitis and diverticulitis are common differential diagnosis. However, these intestinal disorders can also occur within the interposed colon. Though the CS is intermittent in nature relieved by conservative treatment sometimes may present with complications like volvulus of colon, caecal perforation and perforated sub-diaphragmatic appendicitis. Additionally, CS has been associated with a variety of gastrointestinal malignancies involving the colon, rectum or stomach. The following criteria must be met for radiological diagnosis such as, the right hemidiaphragm must be adequately elevated above the liver by the intestine, the bowel must be distended by air to illustrate pseudo-pneumoperitoneum, and the superior margin of the liver must be depressed below the level of the left hemidiaphragm. The findings of normal plicae circulares or haustral markings of the colon under the diaphragm can rule out from pneumoperitoneum and subphrenic abscess. Moreover, changing the position of a patient with chilaiditi sign will not change the position of the radiolucency, unlike in a patient with free air. If a radiograph or ultrasound cannot clearly determine whether the sub-diaphragmatic air is free or intraluminal, a CT scan is recommended to establish an accurate diagnosis, assuming that the patient is clinically stable.^{6,7}

While it presents with distinct radiographic findings, the rarity of the disease, along with variations in clinical presentation often results in misdiagnosis or delayed diagnosis. Chilaiditi syndrome may lead to perforation due to

progressive trapping of administered air in an actually angulated segment of bowel.^{8,9} There is more chance of perforation in these cases during liver biopsy, particularly percutaneous trans-hepatic procedures.¹⁰

We highlight the uncommon presentation of CS like abdominal lump, epigastric fullness and associated anomalies like long suspensory ligament of liver and mesocolon, interposed gall bladder between liver and diaphragm and associated diverticulum of transverse colon, perigastric lymphadenopathy.

The Case

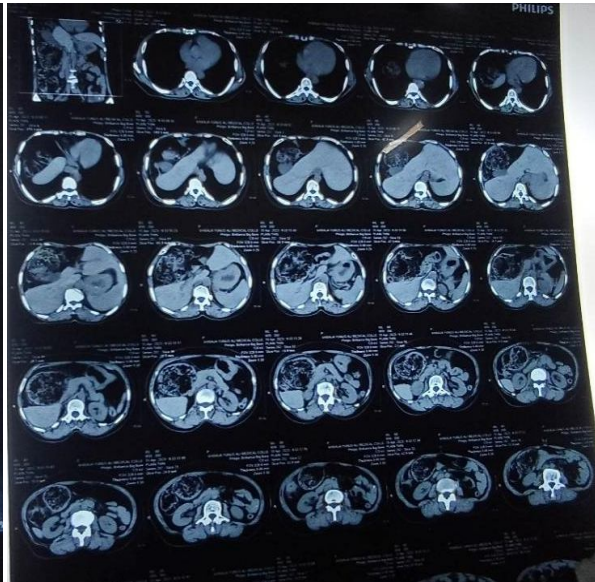
A 52 years old female patient was admitted in the department of surgery, North Bengal Medical College Hospital, Sirajganj, Bangladesh, on 08.05.2023 at 2.30 pm with the complaints of intermittent upper abdominal pain for five years, abdominal lump right to the umbilicus for three years, epigastric fullness after taking food and weight loss for six months. Initially pain and swelling was resolved spontaneously then recurs again but in the last one year lump was persistent and not resolved spontaneously. No history of fever, vomiting, haematemesis, melaena, chest pain, cough, haemoptysis and bone pain. Bowel and bladder habits are normal. No history of Hypertension, Diabetes mellitus and Bronchial asthma. On general physical examination, she was anxious but well oriented, had mild dehydration and anemia, but no jaundice or edema. Pulse rate- 76 bpm, blood pressure- 110/70 mm of Hg, respiratory rate- 18 breath/minute. On abdominal examination, localized distention of abdomen especially in umbilicus, right hypochondriac and right lumbar region. There is an ill-defined, soft, cystic, mobile, intra-abdominal lump occupying right to the umbilicus but moves downwards with respiration. Upper border of liver dullness was obliterated and at 7th intercostal space at mid clavicular line but bowel sound present. Digital rectal examination reveals normal. Investigation showed Hb- 11.9 gm/dl, RBS-5.6 mmol/l, Serum creatinine-65.55 μ mol/l and Ultrasonogram of whole abdomen showed- a large hypoechoic mass measuring about 6x7 cm in size in the abdominal cavity. Plain x-ray abdomen in erect posture showed right dome is elevated, interposition of bowel loop between right dome

and liver and upper border of liver depressed (Figure 1a). CT scan of abdomen showed, interposition of transverse colon is in between right dome of diaphragm and liver, thickening of

gastric mucosa along the fundus and greater curvature (Figure 1b). Endoscopy of upper GIT showed on specific ulcer.

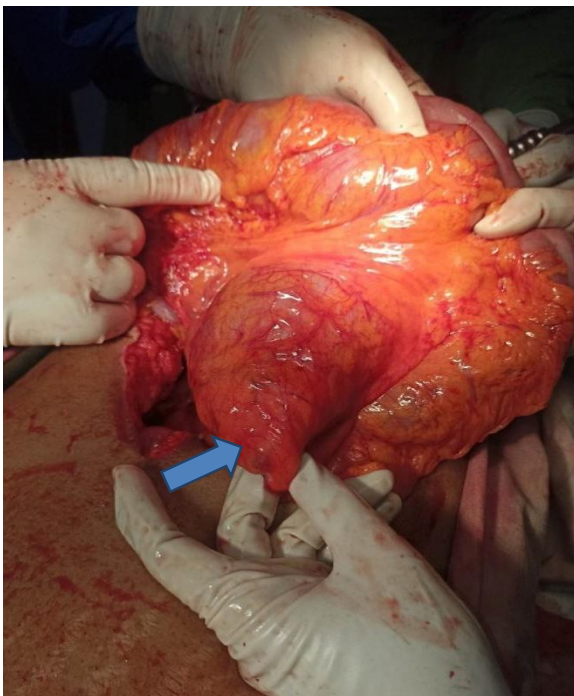


1 (a)



1 (b)

Figure 1: (a) Plain X-ray abdomen showing chilaiditi sign (pseudo-pneumoperitoneum) (b) CT scan of abdomen showing interposition of colon between liver and right dome of diaphragm.



2 (a)



2 (b)

Figure 2: (a) Diverticulum of transverse colon (b) Interposed gallbladder between liver and right dome of diaphragm and redundant colon with long mesocolon (arrow)



2 (c)

Figure 2: (c) Interposed colon between liver and right dome of diaphragm (arrow)

On the basis of patient's condition and investigation findings, surgical intervention was decided to manage this case. After conservative treatment, patient underwent laparotomy and assesses the peritoneal cavity. During initial exploration, it was noted that the hugely dilated, very redundant transverse colon along with mesocolon, suspensory ligament, hepatic flexure, ascending colon interposed between right hemidiaphragm and the liver. There is a large diverticulum arise from transverse colon which was clinically palpable like cystic lump, right lobe of liver is depressed and hypertrophied left lobe of liver. Another two incidental findings were found, one was gallbladder also interposed between the diaphragm and liver, second was indurated area in fundus, greater curvature, and lesser curvature of stomach and perigastric lymphadenopathy. But no ascites, no peritoneal seedling and no liver metastasis was found. After assessment, right hemicolectomy including diverticulum with ileo-transverse anastomosis and cholecystectomy was done. Then biopsy sample was taken from stomach for

histopathological examination. Patient was recovered uneventfully and discharged on 7th postoperative day with no complications.

DISCUSSION

Chilaiditi syndrome (CS) is a rare surgical condition in which the colon is situated between the liver and right hemidiaphragm resulting in clinical symptoms. Its presentation differs individual to individual; many be symptomatic or asymptomatic. Asymptomatic cases are diagnosed incidentally whereas the symptomatic patients may present with abdominal pain, bloating, nausea, vomiting, and constipation.¹¹ Depending on the extent of colon involvement, symptoms might include difficulty in breathing and chest discomfort in more severe instances.⁶ This disease can manifest itself with mild gastrointestinal symptoms for decades, but volvulus or perforations may developed in complicated cases.

This patient presented with intermittent upper abdominal pain due to incomplete or closed loop obstruction of interposed loop. Abdominal lump right to the umbilicus due to hugely enlarged

diverticulum which is the congenital anomaly of transverse colon. Epigastric fullness after taking food and weight loss were also complained. This features usually indicate underlying gastric malignancy. In case of CS occasionally present with malignancy of colon, rectum and stomach. Initially pain and swelling was resolved spontaneously then recurs again but in the last one year lump was persistent and not resolved spontaneously probably due to release of obstruction and empty of diverticulum.

The condition is generally diagnosed by imaging, with CT scans being the preferred imaging modality.⁵⁻⁷ The air below the diaphragm combined with visible haustra is the typical radiographic finding, which does not alter with patient's position. Other radiographic abnormalities include elevation of the right hemidiaphragm above the liver by the intestine and depression of the superior edge of the liver below the left hemidiaphragm.⁵⁻⁷ An interposed segment of bowel can make it very difficult to perform colonoscopy due to the risk of progressive air entrapment in acutely angulated, interposed bowel, which could potentially lead to perforation. In this case, Ultrasonogram of whole abdomen showed- a large hypoechoic mass measuring about 6×7 cm in the abdominal cavity, which was clinically palpable lump of underlying diverticulum of transverse colon. Plain x-ray abdomen in erect posture showed elevated right dome of the diaphragm, interposition of bowel loop between right dome and liver, pseudo-pneumoperitoneum due to haustra and plica circularis of transverse colon and depressed upper border of liver. CT scan of abdomen showed interposition of transverse colon is in between right dome of the diaphragm and liver, additional findings was thickening of gastric mucosa along fundus and greater curvature of stomach but Upper G.I endoscopy and biopsy revealed chronic nonspecific ulcer. No intervention is required for a symptomatic patient with chiladiti sign.

Treatment for CS differs according on the severity of the symptoms. Asymptomatic patients do not require any treatment. Patients with minor or intermittent symptoms can frequently be treated conservatively at first, with colon rest, IV fluids, bowel decompression, enemas, and laxatives.^{5,6}

Bowel decompression documented by a follow up radiograph can confirm both the diagnosis of the condition and the success of the therapy. Surgical therapy is reserved for individuals whose symptoms do not improve with conservative care or when a complication, such as ischemia or perforation is suspected.⁴

In recent years, surgical intervention has been increasingly used in order to manage symptoms of chronic, intermittent abdominal pain. The appropriate surgical approach depends on the nature of the interposed segment of the colon. Cecopexy may be adequate to eliminate the possibility of recurrence in an uncomplicated caecal volvulus,⁵ unless gangrene or perforation necessitates surgical resection. However, colonic resection is the best option for a volvulus of the transverse colon.⁴ Attempts at colonoscopic reduction are not recommended due to a high frequency of gangrene in this type of volvulus. Initially she was resuscitated and treated conservatively by nothing by mouth, Nasogastric suction, Intravenous electrolytes containing fluid, broad spectrum antibiotic, analgesic and urinary catheterization to monitor urine output. After conservative treatment patient was not response. Then she underwent laparotomy and right hemicolectomy including diverticulum with ileo-transverse anastomosis and cholecystectomy was also done. Right hemicolectomy was preferred than the Cecopexy or segmental colectomy due to hugely dilated transverse colon and diverticulum. Cholecystectomy was done for the prevention of complication in future because gall bladder was in ectopic position. Then biopsy was taken from stomach for histopathological examination and unfortunately report was metastatic adenocarcinoma.

CONCLUSION

Usually chiladiti's syndrome (CS) associated with colon interposition but in this case, not only the colon but also associated with gall bladder, hugely dilated diverticulum and incidental metastatic adenocarcinoma. So, every clinician should keep in mind that, CS may be associated with various presentation due to multiple diseases. To avoid complications during minimally invasive procedures such as colonoscopy and liver biopsy, it is necessary to be aware of chiladiti's syndrome as well as chiladiti's sign.

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Conflicts of Interest: None.

REFERENCES

1. Kaparia EM, Link C, Eberhardt JM. Chilaiditi syndrome: A case report highlighting the intermittent nature of the disease. *Case Rep Med.* 2018; 21: 1-3. doi.org/10.1155/2018/3515370.
2. Barroso JJM, Balaguer A, Escribano J, Pagone F, Domenech J, Castillo D, et al. Chilaiditi syndrome associated with transverse colon volvulus: first report in a paediatric patient and review of the literature. *Eur J Pediatr Surg.* 2003; 13(6): 425-428. doi: 10.1055/s-2003-44737.
3. Chilaiditi D. On the question of hepatoptosis and ptosis in general following three cases of temporary partial liver displacement. *Advances in X-rays.* 1910;16:173-208.
4. Weng WH, Liu DR, Feng CC, Que RS. Colonic interposition between the liver and left diaphragm—management of Chilaiditi syndrome: a case report and literature review. *Oncology Letters.* 2014; 7(5): 1657–1660. doi: 10.3892/ol.2014.1903.
5. Moaven O, Hodin RA. Chilaiditi Syndrome: A Rare Entity with Important Differential Diagnoses. *Gastroenterol Hepatol.* 2012; 8: 276-278.
6. Kang D, Pan AS, Lopez MA, Buicko JL, Lopez Viego M. Case report: acute abdominal pain secondary to Chilaiditi syndrome. *Case Rep Sur.* 2013; 2013:1-3. doi:10.1155/2013/756590.
7. Orangio GR, Fazio VW, Winkelman E. The Chilaiditi Syndrome and Associated Volvulus of the Transverse Colon: An Indication for Surgical Therapy. *Dis Colon Rectum.* 1986; 29(10): 653-656.
8. Yin AX, Park GH, Garnett GM, Balfour JF. Chilaiditi syndrome precipitated by colonoscopy: a case report and review of the literature. *Hawaii J Med Public Health.* 2012; 71(6): 158–162.
9. Aldoss IT. Chilaiditi syndrome complicated by cecal perforation. *South Med J.* 2009; 102(8): 841-843.
10. Gurvits GE. Air under the right diaphragm: colonoscopy in the setting of Chilaiditi syndrome. *Gastrointest Endosc.* 2009; 69(3): 758-759.
11. Jackson ADM, Hodson CJ. Interposition of the colon between liver and diaphragm (Chilaiditi's syndrome) in children. *Arch Dis Child.* 1957; 32(162): 151–158.

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3. Bagher L, Alireza M, Abbas AK, Arash HN, Akbar S, Amir B, et al. Peak Bone Mass of Iranian Population: The Iranian Multicenter Osteoporosis Study. J Clin Densitom. 2006; 9(3): 367-374. doi:10.1016/j.jocd.2006.05.001.
4. Hasanuzzaman M. Diagnosis of acute appendicitis and evaluation through modified Alvarado Score. [FCPS dissertation]. Dhaka: Bangladesh College of Physicians and Surgeons; 2004.

5. Jarrett RJ. Insulin and hypertension (Letter). Lancet. 1987; ii: 748-749.
6. Reglic LR, Maschan RA: Central obesity in Asian men. J Clin Endocrinol Metab. 2001; 89: 113-118 [Abstract].
7. Hussain MN, Kamaruddin M. Nipah virus attack in South East Asia: challenges for Bangladesh. Prime Med Coll J. 2011; I (1): i-ii [Editorial].

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