

Profile and Outcome of Medical Emergencies in a Tertiary Care Hospital of Remote and Rural Region of Western Nepal

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Abstract

Background: Medical Emergency has become major public health concern. The profile of the patients attending emergency department reflects the prevailing disease patterns in the region and its outcome mirrors the responsiveness of the healthcare system. This study was aimed to determine the profile and outcome of the medical emergencies presenting to the tertiary care hospital of remote and rural area of western Nepal.

Method: The profile and outcome of 2137 patients attending to the emergency department, Karnali Academy of Health Sciences Teaching Hospital, Nepal from January 2018 to December 2018 was analyzed using descriptive statistics.

Results: The mean age of the patient was (30.13 ± 21.67) years. Gastrointestinal diseases (605, 28.3%), trauma (602, 28.2%), and respiratory diseases (296, 13.9%) were the top three leading cause of morbidity, with acid peptic disorder (male: female = 0.6:1, $p = 0.001$), fall injury (male: female = 1:1.6, $p = 0.001$) and chronic obstructive pulmonary diseases (male: female = 0.7:1, $p = 0.024$) being the major problem respectively. Considering all the medical emergencies, the mean duration of the hospital stay was (5.85 ± 5.9) hours. The total mortality rate was 11 (0.5%), and the main contributor to the mortality was respiratory problems (36.6%) with significant female: male ratio 1:2 ($p = 0.027$), followed by trauma and cardiovascular diseases.

Conclusion: The spectrum of medical emergencies and the pattern of morbidity indicate dual burden of infectious and non-infectious diseases; with gastrointestinal, trauma, and respiratory problems being the most significant three contributors in order. However, the mortality was mainly due to respiratory problems (COPD), followed by trauma (fall injuries) and cardiac diseases. There is a great need of action to improve the responsiveness of existing health care systems to cope with this trend of disease pattern.

Keywords: Emergency, Profile, Outcome, Morbidity, Mortality, Rural, and Remote, Nepal

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I. Background

Medical Emergency is an acute injury or illness posing an immediate risk to a person's health or long-term health, and it has become major public health concern in the developing as well as developed countries. The emergency department (ED) of any hospital provides the initial resuscitation to the patient, diagnosis, appropriate treatment and/or referral of the patient to higher centre depending up on the situation¹. Emergency departments of any hospital are critical for the management of acute illness and injury. Moreover it indicates the provision of health system access in the particular area² and the profile of the patients attending ED reflects the prevailing disease patterns in the region. The overall outcome of the emergencies department depends largely on its infrastructural, instrumental, and human recourses facilities^{3,4}. Hence, the outcome of the emergency department mirrors the responsiveness of the healthcare system and the service in the ED of an institute, and it serves as a valid tool for the appropriate assessment of the overall quality of hospital service delivery^{3,5}.

Karnali Province, one of the seven federal provinces, occupy the higher mountainous land of north and mid-hills of Nepal^{6,7} and is the most remote and backward region in the country. Food crises, malnutrition, illiteracy, adverse climatic conditions, unemployment, poor hygiene and sanitation, inadequate health facilities and low incomes have made people of the area vulnerable to the diseases⁶. Despite the aforementioned facts, Government of Nepal has not yet characterized the burden of various diseases in this area, and it is very high time to provide the scientific evidence of the prevailing diseases. There is a need to ascertain the current burden

of various diseases in Karnali Province. The outcome of this study may provide the valuable information for upgrading the existing emergency health care facility in terms of instrument, infrastructure and human resources required. Thus, the objective of this study is to determine the pattern and outcome of the medical emergencies presenting to the KAHS Teaching Hospital.

II. Material And Methods

Setting

The Karnali province is the most poverty-stricken mountainous remote province of Nepal. It extends up to the elevation of 6,717 meter from sea level. The total area of the province is 24,453 square kilometers⁸. This study was conducted in the KAHS Teaching Hospital, the only tertiary care Teaching Hospital in the province. The hospital has been providing the easy health services to all the districts of the province with 24 hours emergency services, OPD and IPD services under various departments (emergency, medicine, surgery, paediatrics, orthopaedics, gynaecology, obstetrics etc).

Participants and measurements

This study was a hospital based retrospective study. The study was performed on 2,137 patients who visited to the ED of KAHS Teaching Hospital from the January 2018 to December 2018. All patients irrespective of age, sex and ethnicity visiting to ED of KAHS Teaching Hospital for the treatment were included in this study.

Data Collection, processing and statistical analysis

We retrieved the data from the records of all the patients from the ED. The patient's name, age, sex, time of hospital stay, diagnosis, and prognosis of the patient were noted in the structured performa. Both clinical as well as appropriate laboratory methods were used for the diagnosis of all the diseases. An ethical approval was taken from the hospital before starting the study. Then the data were compiled, coded, and entered in spread sheet and then analyzed by SPSS version 20 (Statistical Package for Social Science, Inc., Chicago, USA). Data accuracy and reliability was maintained by double entry into the SPSS. Percentage, mean, standard deviation and proportion were calculated as univariate and bivariate analysis. Chi-square test was applied to show the distribution and association between the different variables. The criterion for statistical significance was set at the value of $p < 0.05$. The analyzed data were presented in tables, graphs/charts and narrative form as per necessity.

III. Results

Demographics:

Out of 2137 patients visited during the study period, majority were male (52.5%) than female (1,015, 47.5%) with the male: female ratio 1.1:1 ($p = 0.021$). The mean, standard deviation, median, mode and range of age were shown in table 1. The age distributions of the patients showed majority of the patients (1,003, 46.9%) were between the age adult (20 - 59 years) which is followed by children aged below 9 years, adolescent (10-19 years), and old age (above 60 years) (figure 1).

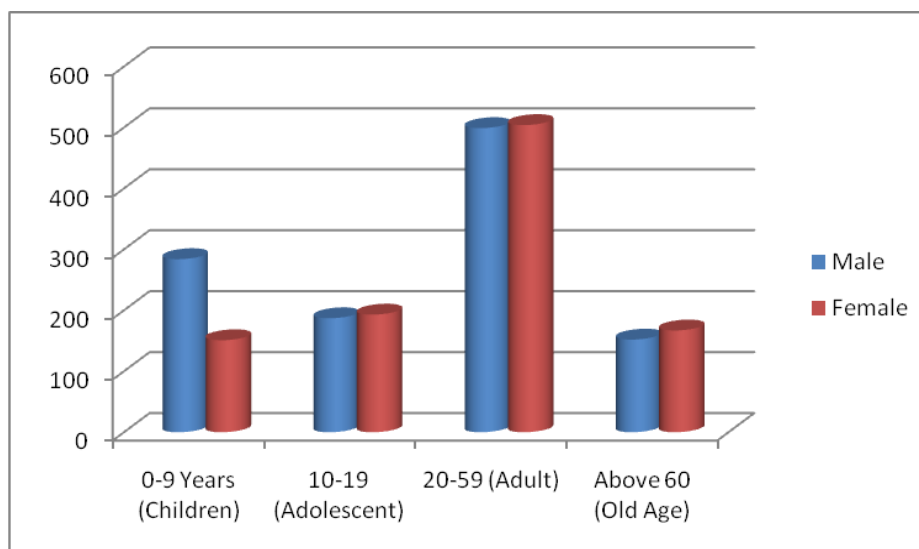


Figure 1: Age-wise burden of diseases in emergency department

Table 1: Sex-wise burden of diseases in emergency department

S.N.	Sex	Frequency	Percentage	Age (Mean ± S.D.)	Median Age	Mode	Range
1	Male	1119	52.4	28.69 ± 22.11	24 years	60 years	0 - 90 years
2	Female	1018	47.6	31.71 ± 21.0	28 years		

Profile of Emergencies:

Regarding the overall burden of diseases (shown in the figure 2) in ED, Majority of the patients (605, 28.3%) presented with gastrointestinal diseases. The injury and trauma (602, 28.2%), respiratory diseases (296, 13.9%), and urological diseases (165, 7.7%) were most common thereafter.

Among the gastrointestinal emergencies, APD (acid pepsin disorder) (49.6%) and AGE (acute gastroenteritis) (32.2%) were the major problem (with significant male female ratio) followed by other gastrointestinal diseases as shown in table 2.

Similarly, out of the respiratory emergencies (shown in Table 3), Chronic obstructive pulmonary diseases (COPD) was the leading cause (123, 41.6%) of the morbidity with significant female male ratio (1.5:1, p = 0.024). LRTI (lower respiratory tract infection), URTI (upper respiratory tract infection), and Pulmonary Tuberculosis (PTB) were other common diseases thereafter.

Among the urological problems, majority of the patients (99, 60%) suffered from UTI (urinary tract infection) with the male: female ratio 1:2.5 (p = 0.001) followed by renal problems, BPH (benign prostatic hyperplasia) and others as shown in figure 3.

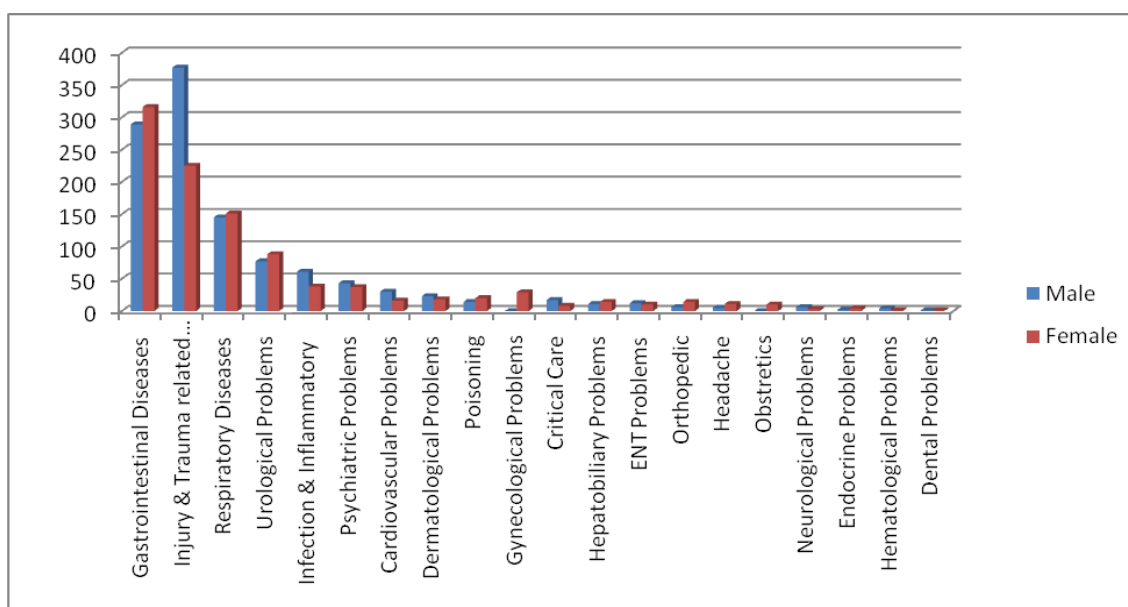


Figure 2: Burden of various diseases in the emergency department of the KAHS Hospital

Table 2: Burden of gastro-intestinal diseases in the emergency department of KAHS Hospital

S.N.	Gastrointestinal Problems	Sex		Total	p - value
		Male	Female		
1	APD	120 (19.1%)	191 (30.5%)	311 (49.6%)	0.001
2	AGE	117 (18.7%)	85 (13.6%)	202 (32.2%)	0.024
3	Appendicitis	19 (3.0%)	15 (2.4%)	34 (5.4%)	0.491
4	Pain Abdomen	16 (2.6%)	8 (1.3%)	24 (3.8%)	0.102
5	Cholelithiasis	3 (0.5%)	8 (1.3%)	11 (1.8%)	0.132
6	Dysentery	1 (0.2%)	10 (1.6%)	11 (1.8%)	0.007
7	Hepatitis	6 (1.0%)	4 (0.6%)	10 (1.6%)	0.527
8	Intestinal Obstruction	10 (1.6%)	4 (0.6%)	14 (2.2%)	0.109
9	Others	6 (1.0%)	4 (0.6%)	10 (1.6%)	0.527
	Total	298 (47.5%)	329 (52.5%)	627 (100.0%)	

Table 3: Sex-wise burden of respiratory diseases in the emergency department of the KAHS Hospital

S.N.	Respiratory Problems	Sex		Total frequency /percentage	p - value
		Male	Female		
1	COPD	49 (16.6%)	74 (25.0%)	123 (41.6%)	0.024
2	LRTI	65 (22.0%)	46 (15.5%)	111 (37.5%)	0.071
3	URTI	20 (6.8%)	24 (8.1%)	44 (14.9%)	0.546
4	PTB	5(1.7%)	4(1.4%)	9 (3.0%)	0.739
5	Others	5(1.7%)	4(1.4%)	9 (3.0%)	0.739
	Total	144(48.6%)	152(51.4%)	296(100%)	

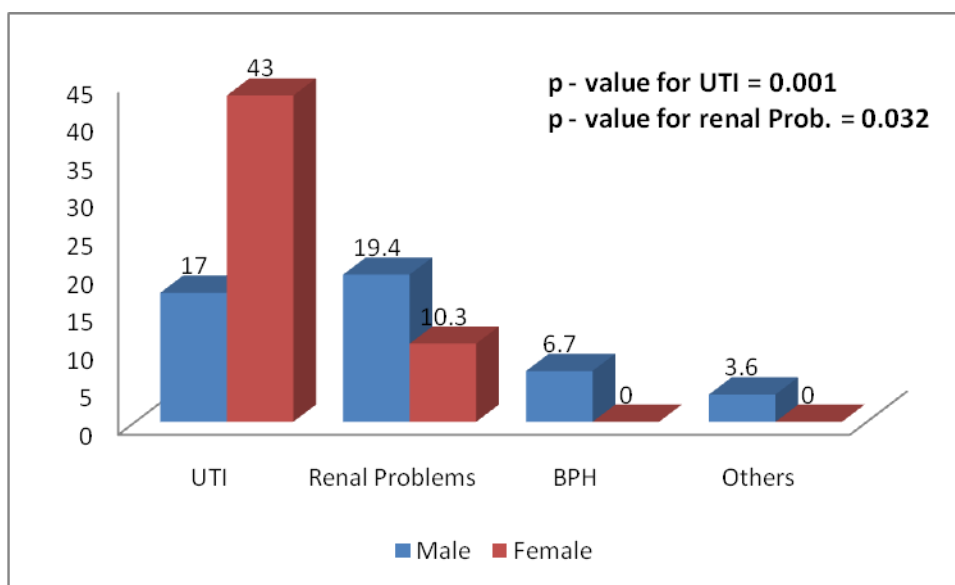


Figure 3: Profile of urological diseases in percentage

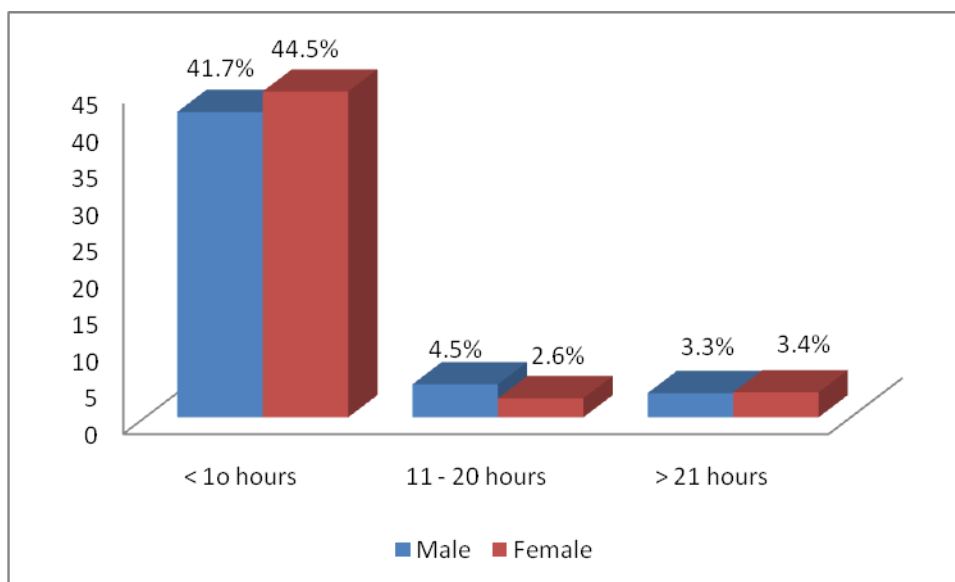


Figure 4: Duration of hospital stay

Outcome of the patients in ED:

Regarding the outcome of the patients attending to ED, majority (1182, 86.2%) were stayed at hospital for less than 10 hours. Only 98 (7.1%) of the patient stayed 11 to 20 hours and 91(6.6%) of the patients stayed for more than 21 hours. The mean duration for the patients staying in ED was 5.85 ±5.9 hours (range = 1-48 hours, Mode = 2 hours) (figure 4). Similarly, the outcome of the present study revealed that 1374 (64.3%) of the patients were discharged, whereas 563(26%) were admitted to IPD and only 67(3.1%) of the patients were referred. Similarly, less frequent outcome of the patient from hospital were DOR (discharge on request) was 59(2.8%), LAMA (leave against medical advice) was 53(2.5%) and some patient absconded (11,0.5%) from hospital without inform (figure 5).

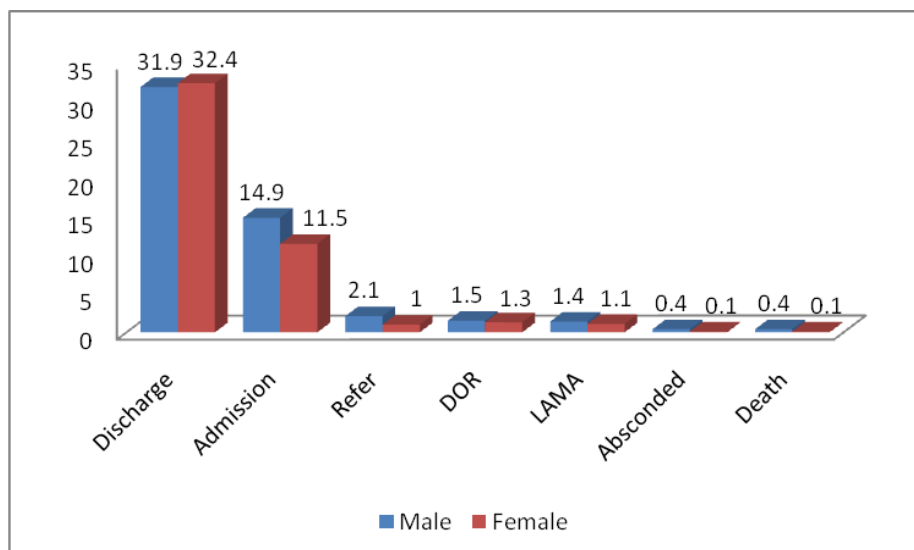


Figure 5: Outcome of the patients in percentage

The mortality rate was 11(0.5%) and the main contributor to mortality was from respiratory diseases (6, 54.5%) with the male: female ratio 1:2 ($p < 0.05$, 0.027). Similarly, injury (3, 27.3%) and cardiovascular diseases (2, 18.2%) were the second and third common cause of mortality (figure 6).

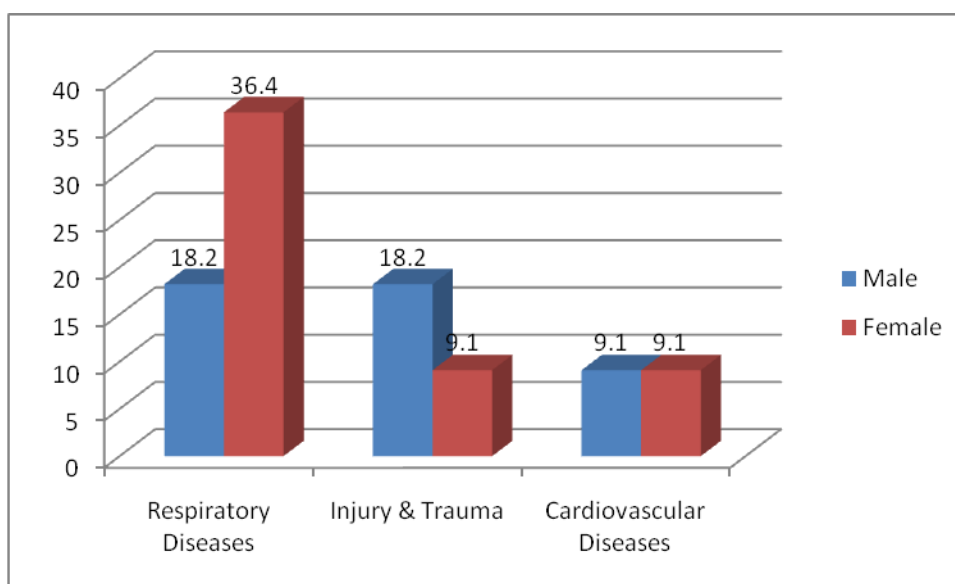


Figure 6: Percentage of mortality of the patient

IV. Discussion

The present study has attempted to determine the profile and outcome of various diseases visiting in the ED of KAHS Teaching hospital aiming to have an insight into the overall burden of diseases. In this study the mean age of the patients was (Male = 28.69 ± 22.11 , female = 31.71 ± 21.0) years, ranging from 0 to 90 years. About half of the patients (46.9%) were in between the age group of 20 to 59 years, followed by less than 9 years (20.4%) and 10-19 years (17.8%) age group. This pattern of patient's age profile is similar to the finding of Ogah et.al⁹ who reported that majority of medical admissions (51.3%) in the emergency room of a tertiary centre in South West Nigeria were from age group 20 to 49 years. This suggests that the adult patients who are at the peak of productivity are more vulnerable to medical emergencies, and it has huge socioeconomic consequences in the healthcare expenditure and reduced GDP from low productivity. Moreover, this trend may also leads to the low life expectancy in the country since a significant proportion of mortality would be expected by various diseases in this age group. Our study showed nearly equal burden of emergencies in both sex which is supported by the findings of Ogah et.al⁹.

Our study found that gastrointestinal diseases accounted for 28.3% of the total hospital visit and is the first leading cause for the patients seeking emergency services. This finding was higher than 7.8% in the rural resident of Hebei province, China¹⁰. This higher morbidity of gastrointestinal diseases may be due to unavailability of food, poverty, draught in the area, smoking, and alcoholism. Various studies^{9,11,12} revealed that non-communicable diseases (NCD) like hypertension and stroke, diabetes and renal diseases are the most common causes of medical emergencies, however overall our study showed gastrointestinal related emergencies like APD and AGE were most common causes of medical emergencies. This suggests that we are still starving to combat for the minor preventable and avoidable medical problems. This may be due to poverty and lack of knowledge regarding to nutrition and medical education. Further analysis of the subset of gastrointestinal diseases revealed that half of the patients were from APD (female: male ratio 1.6:1, $p = 0.01$) whereas intestinal obstruction (2.2%) was the least common cause of gastrointestinal morbidity. AGE (acute gastroenteritis) was found as the second leading cause of morbidity (32.2%), finding is about three times higher than a study done in Tamil Nadu, India¹³. This higher percentage of morbidity may be due unhygienic food habits and low sanitary condition of our study population.

The present study showed that injury and trauma were the second leading cause of morbidity accounting for the 28.2% of the total emergency cases. Also, it was observed that male (62.6%) was injured more than female (37.4%). This finding of our study is supported by a various studies conducted in Nepal by Mehta et.al¹⁴ and in Bangladesh by Hussein et.al¹⁵. The reasons behind the high predilection of injury and trauma in males may be due to their more involvement in outdoor activities than females.

This study found that respiratory problems were the third leading cause of morbidity in the emergency department. On further analyzing the subset of respiratory problems, it showed that COPD (41.6%) is the leading cause of respiratory emergencies, males were affected more than female ($p = 0.24$) more in female ($p = 0.071$). The respiratory morbidity in our study area is higher than the study done by Aryal et al¹⁶ in 2015 and Etyang et al¹⁷. in 2014. This higher prevalence of respiratory problems may be due to smoking and practice of firewood for the cooking purposes. Also our study showed that morbidity due to PTB was only 3% which is far less than the national survey done by Aryal et.al¹⁶ in 2015 and global burden of communicable diseases^{18,19}. Present study showed that males suffered more (1.7%) with PTB then female (1.4%) which is supported by a study done in Jutpani VDC, Chitwan, Nepal²⁰.

Urological problems were the fourth most common cause of morbidity. Among them UTI was the most common cause of urological morbidity (female: male ratio 2.5:1 ($p = 0.001$)). This finding of our study is supported by Oladeinde et al²¹ in 2011 and August et al²² in 2012. The reason behind this may be due to short female urethra and presence of urethral meatus in the vestibule of vulva which might increases the chances of contamination.

The present study found that infection and inflammatory diseases (4.6%) were the fifth most common cause of morbidity. These findings are in contrast to the global data which showed that incidence, morbidity and mortality due to infection and inflammatory diseases in developing and under-developed country is about 45%^{23,24}. Psychiatric (3.7%) problems were the fifth main cause and the findings is supported by a study conducted by Mistra et al in 2015 which showed that approximately 4% of the patients were seeking medical services from emergency department²⁵. The morbidity due to cardiovascular disease (2.2%) was found to be less common of emergencies. This is less than reported in Hebei Province, China (4.5%)¹⁰. This may be attributed to physiology adaptation to high altitude in our study population^{25,26}.

The present study showed that about two third (64.3%) of the patients were discharged from emergency whereas one fourth of the patients (26%) were admitted to IPD and only 3% of the patients were referred to other centre for better management. Similarly, 2.8% of patients were discharged DOR (discharge on request), 2.5% LAMA (leave against medical advice) and an interestingly 0.5% of the patient absconded (0.5%) from hospital without inform. The mortality in the emergency department is 0.5%. The finding of the present study is supported by various other studies^{11,27}.

The mortality rate was only 0.5%. Out of them, 36.3% mortality was from respiratory diseases and 18% of mortality was from injury. This overall mortality rate is less than the 2% emergency mortality recorded by Ekere et.al⁵ and is far less than the 10.1% as reported by Akpa M.R. et al¹. Similarly, another epidemiological study of south Nigeria has reported 41.3% mortality in the emergency department²⁸. This very low mortality rate in our study is because gastrointestinal diseases like APD and AGE are the main leading cause of morbidity in emergency department, which are not as fatal as NCD. Also this huge gap between the mortality in emergency department of this study from other study may be due to lack of awareness for seeking medical help for chronic diseases. Most of the time people from remote and rural area don't visit hospital unless they suffered from a severe symptoms and/or injury²³.

The study being hospital based, it may not reflect the real scenario of emergency conditions in this area. Due to the remotes of the region, it is very difficult for people to get the emergency health facilities of the

hospital in time. In addition, people practice complimentary and traditional healing system before seeking hospital services. These may have cause the underestimation of morbidity and mortality in our study.

V. Conclusion

The spectrum of medical emergencies and the pattern of morbidity indicate dual burden of infectious and non-infectious diseases; with gastrointestinal, trauma, and respiratory problems being the most significant three contributors in order. However, the mortality was mainly due to respiratory problems (COPD), followed by trauma (fall injuries) and cardiac diseases in remote and rural area of western Nepal. Regarding morbidity, females significantly outnumbered the males in every cases, whereas, mortality was mainly borne by male patients. There is a great need of action to improve the responsiveness of existing health care systems to cope with this trend of disease pattern.

References

- [1]. Akpa MR, Alasis DD, Altraide DD, Emem-chioma PC, Wokoma IS. Profile and outcome of medical emergencies in a tertiary health institution in Port Harcourt, Nigeria. *The Nigerian Health Journal*. 2013;13(1):48-53.
- [2]. He J HX, Toloo S, Patrick JR, Fitz Gerald G. . Demand for hospital emergency departments: a conceptual understanding. *World J Emerg Med*. 2011;2(4):253-61.
- [3]. Kilbreth B SB, Westcott D, Gray C. Analysis of Emergency Department Use In Maine: A Study Conducted on Behalf of the Emergency Department Use Work Group of the Maine Advisory Council on Health System Development January, 2010.2010.
- [4]. J. R. The Patient Journey Through Emergency Care in Nova Scotia: A Prescription for New Medicine October 2010. 2010.
- [5]. Ekere AU YB, Umune S. Mortality Pattern in The Accident and Emergency Department of An Urban Hospital in Nigeria. *Nig J of Clinical Practice*. 2005;8(1):14-18.(1):14-8.
- [6]. Gurung Y. Social Demography of Nepal: Evidences from Population and Housing Census 20112014.
- [7]. Government of Nepal. National Population and Housing Census 2011. Kathmandu, Nepal: Central Bureau of Statistics2011.
- [8]. Karnali Academy of Health Sciences. About Institution. [cited 2018 september 23]; Available from: <http://kahs.edu.np/about-institution>.
- [9]. Ogah OS, Akinyemi RO, Adesemowo A, Ogbodo EI. A Two-Year Review of Medical Admissions at the Emergency Unit of a Nigerian Tertiary Health Facility. *Afr J Biomed Res* 2012;. 2012;15(59-63).
- [10]. Yang J, Yu W, Zhou Q, Mahapatra T, Li Y, Zhang X, et al. Burden and correlates of non-communicable-diseases among rural residents: a cross-sectional study in Hebei, China. *BMC public health*. 2015 Jun 20;15:571.
- [11]. Odenigbo CU, Oguejiofor OC. Pattern of medical admissions at the Federal Medical Centre, Asaba-a two year review. *Niger J Clin Pract* 2009;12(4):395-7.
- [12]. Sani MU, Mohammed AZ, Adamu B, Yusuf SM, Samaila AA, Borodo MM. AIDS mortality in a tertiary health institution: A four-year review. *J Natl Med Assoc*. 2006;98(6):862.
- [13]. Purty AJ, Bazroy J., Kar M., Vasudevan K., Zacharia P., Panda P. Morbidity Pattern Among the Elderly Population in the Rural Area of Tamil Nadu, India. *Turkish Journal of Medical Sciences* 2006;36:45-50.
- [14]. Mehta RK, Rai S., Mehta R. Epidemiological Study on Road Traffic Accident Cases Reporting to a Tertiary Care Government Hospital. *International Journal of Multidisciplinary Research and Development*. 2015;2(5):539-43.
- [15]. Hossain QS. Road traffic accident situation in Kuluna City, Bangladesh. *Proceeding of the Eastern Asia Society for transportation studies*, . 2005;5:64-74.
- [16]. Aryal KK, Mehata S, Neupane S, Vaidya A, Dhimal M, Dhakal P, et al. The Burden and Determinants of Non Communicable Diseases Risk Factors in Nepal: Findings from a Nationwide STEPS Survey. *PloS one*. 2015;10(8).
- [17]. Etyang AO, Munge, K., Bunyasi, E.W., Matata L, Ndila C, Kapesa S, Owiti M, Khandwalla I, Brent AJ, Tsofa B, Kabibu P. . Burden of disease in adults admitted to hospital in a rural region of coastal Kenya: an analysis of data from linked clinical and demographic surveillance systems. *The Lancet Global Health*. 2014;2:216-24.
- [18]. WHO. GLOBAL BURDEN OF DISEASE. *GBD Magazine*. 2017.
- [19]. WHO. Burden of NCDs and their risk factors in India. 2014.
- [20]. Amgain K, Paudel DP, Paneru DP, Dhital M, Amgain G. Gender difference on case detection of pulmonary Tuberculosis among the suspected cases attending In jutpani primary health centre of chitwan, nepal. *SAARC Journal of Tuberculosis, Lung Diseases & HIV/AIDS*. 2013; X(1):7-12.
- [21]. Oladeinde BH, Omoregie R, Olley M, Anunibe JA. Urinary tract infection in a rural community of Nigeria. 2011;3(2):75-7. *N Am J Med Sci*. 2011;3(2):75-7.
- [22]. August SL, De Rosa MJ. Evaluation of the Prevalence of Urinary Tract Infection in Rural Panamanian Women. *PLoS ONE* 2012;7(10).
- [23]. Bhutta ZA, Sommerfeld J., Zohra S. Lassi, Rehana A Salam, Jai K Das. Global burden, distribution, and interventions for infectious diseases of poverty. *Infectious Diseases of Poverty* 2014, 3:21. 2014;3(21).
- [24]. Shumbusho E. The Trend of Communicable and Non-Communicable Diseases in East African Community (EAC) Countries: Case Study of Burundi, Rwanda, and Uganda - 1990 to 2013. *Wright State University, CORE Scholar*. 2016.
- [25]. Mishra SR, Neupane D, Bhandari PM, Khanal V, Kallestrup P. Burgeoning burden of non- communicable diseases in Nepal: a scoping review. *Globalization and health*. 2015 Jul 16;11:32.
- [26]. Hainsworth R, Drinkhill, M.J., Rivera-Chira, M. The autonomic nervous system at high altitude. *Clin Auton Res*. 2007;17:13-9.
- [27]. Ogunmola O, & Oladosu, O. (2014). . Pattern and outcome of admissions in the medical wards of a tertiary health center in a rural community of Ekiti state, Nigeria. , 13(4), 195. . *Journal of Emergencies, Trauma, and Shock* 2014;17(4):195.
- [28]. Ugare GU, Ndifon W, Bassey IA, Oyo-Ita AE, Egba RN, Asuquo M, et al. Epidemiology of death in the emergency department of a tertiary health centre south-south of Nigeria. *Afr Health Sci*. 2012 Dec;12(4):530-7.

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