

Burden of Non-communicable Diseases in a Western Mountainous Region of Nepal: a Hospital Based Study

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ABSTRACT



Background: Non-communicable diseases (NCDs) are medical conditions or diseases that are non-transmissible from one person to another. NCDs have become the leading cause of morbidity and mortality worldwide. The objective of this study is to determine the burden of NCDs in a tertiary level general hospital in a mountainous region of Nepal.

Methodology: A hospital based retrospective study was conducted in Karnali Academy of Health Sciences (KAHS). Data was collected from admission registers that contained information of patients (15 or more years of age) admitted to medicine ward during July 2019- October 2020. Statistical analysis was done using SPSS 22. Results were expressed in frequency and percentage.

Results: Out of 762 total cases admitted, prevalence of NCDs was more than the half (55.6%). 49% of the patients were older people with age more than sixty years and most of the patients were female (61%). Brahmin/ Chhetri comprised the most common ethnic group (60%). COPD was the most common NCD (56%) followed by CVD and ARD (18% and 5% respectively). Most of the patients of COPD (63.75%) were more than sixty years of age two-third cases of COPD (65%) were female.

Conclusions: NCDs contribute to a notable burden of disease in the rural mountainous region of the Karnali. Chronic respiratory disease and diseases related to cardiovascular origin constitute the top causes of morbidity. Stakeholders of health care should come up with concrete strategies to fight this growing health concern.

Keywords: Burden, COPD, CVD, Karnali, Non-communicable disease (NCD), Prevalence

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INTRODUCTION

Non-communicable diseases (NCDs) refer to diseases or conditions that occur in, or are known to affect individuals over an extensive period of time and for which there are no known causative agents that are transmitted from one affected individual to another.¹ NCDs have become the leading cause of morbidity and mortality globally. As mentioned by the World Health Organization (WHO) 2018 fact sheet, NCDs contribute to 71% of total annual deaths worldwide.² Cardiovascular diseases (CVDs) account for most NCD-related deaths worldwide (17.9 million annually), followed by cancers, chronic respiratory diseases and diabetes. Interestingly, more than 80% of the global burden of CVD occurs in 'low middle income' country (LMIC) like Nepal.³ Yet, there is a paucity of rigorous high-quality data in LMICs about NCDs and their risk factors.⁴ Like many other developing countries, NCDs are emerging as a major cause of morbidity and mortality in Nepal too.⁵

A study of national burden of diseases in Nepal, 2017 showed that NCDs contributed to the leading cause (66%) of death of the total deaths.⁶ This result published by the Ministry of Health and Population of Nepal showed that of the total deaths, ischemic heart disease (16%) and COPD (10 %) were the most common forms of NCDs. Another study by Bhandari et al.⁷ showed that COPD held the highest rank for prevalence of NCDs in Nepal (43%) followed by CVD (40%), Diabetes (12%) and cancer (5%). The increasing trend of NCDs related morbidity and mortality have put huge pressure on the compromised and already fragile health systems of Nepal. The prevailing health system in Nepal is still poorly organized with weak health information systems and

inefficient delivery of health care services.⁵ It is not known what burden of NCDs we are dealing with in this region of the country. This study is conducted to assess the burden of NCD among patients admitted in medicine ward in KAHS over the period of last fifteen months and therefore, shall add some important data about the prevalence and pattern of NCDs.

MATERIALS AND METHODS

A single center, descriptive study conducted in Karnali Academy of Health Sciences (KAHS), a multi-disciplinary tertiary level hospital located in remote area in Karnali province. The hospital covers the people living largely in mountainous and high hill regions in the region. A complete list of patients who got admitted to the adult medical ward during the last fifteen months (15th of July 2019- 15th of October 2020) was acquired from the ward register and required information was collected retrospectively. This was a separate ward that admitted patients who were fifteen years of age or older, with medical conditions only. Discharge information included age of the patient, sex, ethnicity, place of residence ecological zone and the diagnosis. The diagnosis was made by a specialist doctor of internal medicine, carried out in the discharge sheet by responsible medical officers which was maintained accordingly in the registry by nursing staffs.

First of all, patients were broadly identified as those with NCDs and not with NCDs. NCDs were further grouped into following categories: chronic obstructive pulmonary disease (COPD), cardiovascular disease (CVD) like structural heart disease, ischemic heart disease, heart failure, arrhythmias and

hypertension, alcohol related disease (ARD) like alcohol withdrawal, liver cirrhosis, gastrointestinal bleeding, hepatic encephalopathy, Diabetes, Acid Peptic Disease (APD), Cancer and other NCDs (dermatological, auto-immune and hematological disease). Statistical analysis was done by using SPSS 22 and results expressed in frequency and percentage. Ethical clearance was acquired from Institutional Review Committee (IRC), KAHS (reference number 077/078/011).

RESULT

A total of 762 cases were found to have admitted in the medicine ward during the study period. Among those, 424 cases (55.6%) had diagnosis for NCDs (figure 1).

Figure 1: Total cases in the medicine ward

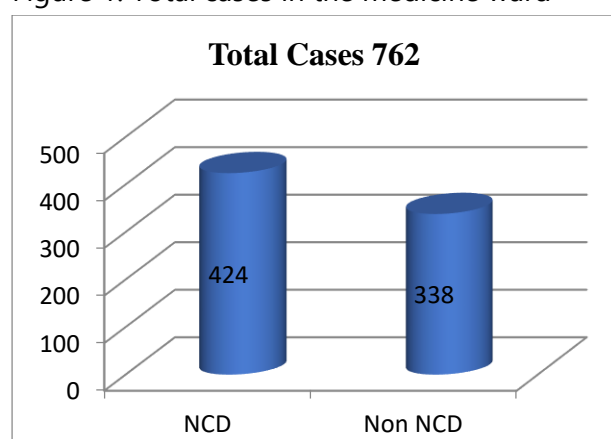


Table 1: Socio-demographic characteristics of the patients

Characteristics		Frequency (f)	Percentage (%)
Age (in Years)	15-39	47	11.1
	40-60	168	39.6
	>60	209	49.3
Sex	Male	163	38.4
	Female	261	61.6

Ethnicity	Brahmin/Chhetri	255	60.1
	Dalit	109	25.7
	Janajati	59	13.9
	Others	1	0.2
Place of Residence	Rural	420	99.1
	Urban	4	0.9
Ecological Zone	Mountains	394	92.9
	Hills	28	6.6
	Plains	2	0.5

Nearly half of the patients (49%) were more than sixty years of age and majority of the patients (61%) were female. Brahmin/ Chhetri (60%) were the most common ethnicity. Almost all of the patients (99%) were residents of rural area, specifically the mountainous region (93%) and the high hills (6%) as shown in table 1.

Table 2: NCD pattern and prevalence

Diagnosis	Frequency	Percent
COPD	240	56.6
Cardiovascular Disease	79	18.6
Alcohol Related Disease	23	5.4
Disease of the Kidney	15	3.5
Neuropsychiatric Illness	12	2.8
Acid Peptic Disease	15	3.5
Diabetes Mellitus	9	2.1
Asthma	6	1.4
Malignancy	5	1.2
Other*	20	4.7
Total	424	100.0

More than half of the patients with NCD were diagnosed to have COPD (56%) whereas CVD was the second most common entity with 18% (79 patients).

*Other NCDs: interstitial lung disease, sarcoidosis, seizure disorder, stroke, thyroid disease, diabetes insipidus, anemia and blood dyscrasia.

Table 3: Socio-demographic variables in relation to the top three NCDs

Diagnosis (total cases)		Age (in years)			Sex		Ethnicity			
		15-39	40-60	>60	Male	Female	B/ C*	Dalit	Janajati	Others
COPD (240)	Count	2	85	153	84	156	148	59	32	1
	% within Age	4.3 %	50.6 %	73.2 %	-	-	-	-	-	-
	% within Sex	-	-	-	51.5	59.8	-	-	-	-
	% within Ethnicity	-	-	-	-	-	58	54.1	54.2	100
	% within Disease	0.85	35.4	63.7	35	65	61.6	24.5	13.3	0.4
CVD (79)	Count	8	33	38	36	43	44	22	13	0
	% within Age	17.0 %	19.6 %	18.2 %						
	% within Sex				22.1	16.5				
	% within Ethnicity						17.3	20.2	22.0	0
	% within Disease	10.1	41.7	48.1	45.5	54.5	55.6	27.8	16.4	0
ARD (23)	Count	2	16	5	8	15	12	7	4	0
	% within Age	4.3 %	9.5 %	2.4 %	-	-	-	-	-	-
	% within Sex	-	-	-	4.9	5.7	-	-	-	-
	% within Ethnicity	-	-	-	-	-	4.7	6.4	6.8	0
	% within Disease	8.6	69.5	21.7	34.7	65.2	52.1	30.4	17.3	0

*Brahmin/ Chhetri

Out of 240 cases of COPD, almost two-third of the total cases (63.7%) were patients more than sixty years of age. Interestingly, two-third (65%) cases of COPD were female. Prevalence of COPD and CVD was uniform between male and female both (Mean percentage 55.5 and 19 for COPD and CVD respectively). Also, COPD was seen equally prevalent among all major ethnic groups (Mean percentage almost at the same proportion (Mean percentage 55). Regarding ARD, more women were admitted to the medical ward than male with conditions relating to use of alcohol (n= 15 for female and n=8 for male). Though a small data, it was observed that Dalit and Janajati group were the common patients of ARD.

DISCUSSION

This study was aimed at showing the magnitude of NCDs in a health facility in rural mountainous region of Nepal over a period of fifteen months and covered all patients who were admitted to the medical ward of KAHS, a tertiary level hospital. The magnitude of NCDs that this study finds (56%) seems to be in line with result from other many study from Nepal and abroad.^{6,8-11} There are ample evidences from all around the world that show how NCDs have attained the top spot among recent global burden of disease. Though initially regarded as a matter of woe concerning specifically to high income nations, NCDs are becoming increasingly prevalent in middle

and low income countries too. This result was also comparable with findings of a study in Myanmar, a LMIC like Nepal that showed higher burden of NCDs.¹²

Disease wise, this study shows that COPD stands by far, at the top of the list while CVD and ARD and chronic diseases of the kidney fit in top four of the NCD list. This result seems comparable with results from a recent population-based prevalence study of selected NCDs by the Government of Nepal among population aged 20 years above in Nepal which showed that COPD as the most commonly prevalent NCD followed by diabetes, chronic kidney diseases and coronary artery diseases.¹³

Furthermore, COPD was the most common NCD followed by CVD, DM and cancer in a study conducted by Bhandari et al.⁷ in various hospitals outside the Kathmandu valley in Nepal. A very high proportion of COPD cases in our study could be compared to life style attributes such as use of traditional cooking stove and combustion of solid biomass fuel such as animal dung, wood and crop residue.¹⁴

Interestingly, life style in this region is such that consumption of cigarettes (non-filtered too) is also very high among people of all age, ethnicity and both gender. Women in this province consume more cigarettes than women from any other province in the nation.¹⁵ Just to top up the woe, women again have to do all the household including cooking which further expose them to indoor air pollution. Hence, the finding of this study that two third of the cases of COPD were women reasonably correlates perfectly in line with another study that showed COPD was

more common among women in western region of Nepal.¹⁶ Additionally, COPD was seen more commonly among older people and this fact probably relates to chronic smoking and prolonged exposure to smoke. Similar finding was observed by a study conducted by Bhandari et al.⁷ that showed COPD was seen more often in older age group of people.

The alarming burden of CVD for Nepal has also been highlighted by WHO observatory.⁷ It showed that CVD attributed to majority of NCD deaths in Nepal. This study also suggests that CVD not very uncommon in this region. Furthermore, what is notable is that CVD was observed among patients of all age groups and not limited to older people only.

A study in eastern part of Nepal showed that almost 60% of the study participants consumed alcohol.¹⁷ This is considerably a mirror picture of the entire nation. Another study from Dhulikhel hospital, a multi-specialty tertiary level hospital also showed that nearly one in five NCD hospitalization were attributed to ARD.¹⁸ Since this study incorporated only those patients who required admission for the management, that is one probable reason that the number of cases with ARD is less comparable with result from above mentioned studies. However, with what so ever data we have, it is implacable that more women than men were admitted to the medical ward with conditions relating to use of alcohol and ethnicity wise, ARD was more prevalent among Dalit and Janajati group of people .

As COPD, CVD and CKD compare perfectly well in ranking of the most common NCDs, DM

and cancers didn't quite make a parallel observation. Both DM and cancer couldn't be seen among the top four NCDs in our study. Probable explanation could be because DM as we know, is associated with factors like sedentary lifestyle choices and unhealthy diet (specifically high sugar and fat) among others. Owing to socio-economic status of the general people in this region of Nepal, it is very likely that most of them have to work hard every day for their living. This could be one reason why DM is not very prevalent in this robust terrain of the country. Similarly, the proportion of cancer was also lower. This might be the result of patients travelling to cities for diagnosis and treatment at specialist cancer hospitals instead of general hospital like ours. Furthermore, common cancers like ovarian cancer and other cancer relating to gynecological concerns were out of the scope of this study.

There are few notable limitations of the study. KAHS serves as a general hospital in one of the remotest regions in the world and quite obviously, it is lacking in infrastructure and diagnostic and treatment facilities for many heart conditions. Many cases with ischemic heart disease may have been referred from the emergency department itself. There may have been plenty of referral of suspected cases of cancer too to specialist hospitals. All this might have resulted in lesser percentage of CVD and cancer.

Health authorities worldwide have been much concerned about the looming prevalence of NCDs. At national level, Nepal too has adopted the Multi-Sectoral Action Plan for NCD (2014-2020) that has set specific targets and indicators aimed at reducing preventable morbidity, avoidable disability and premature mortality attributed to major NCDs.¹⁹ However, early detection through screening of common NCDs and its primary management that should be the core basis for control of NCDs is still lacking. Not just that, community health education regarding healthy life style and mitigation of modifiable risk factors need to be strengthened. Since this is a retrospective study, narrowing of the source of information is considerably the eminent limitation of the study.

CONCLUSION

NCDs contribute to a notable burden of disease in the rural mountainous region of the Karnali. Chronic respiratory disease and diseases related to cardiovascular origin constitute the top causes of morbidity. Stakeholders of health care should come up with concrete strategies to fight this growing health concern. This study from the mountainous region warrants the stakeholders of health care to come up with concrete plan and targeted interventions with multi-sectoral approach for prevention, treatment and control of NCDs.

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