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Clinical and Epidemiological Profile of COVID-19 Patients at a Tertiary Care Center of Nepal: A Retrospective Observational Study

Rajesh Kumar Mandal
Consultant Physician, Department of Internal Medicine
Bheri Hospital, Nepalgunj, Nepal

Sunil Kumar Daha
Medical Officer, Department Of Emergency
Bardibas Hospital, Bardibas, Nepal

Abstract:-
Background: COVID-19 has become a global pandemic with the spectrum of disease from asymptomatic to severe cases requiring intensive care unit admissions linked to higher mortality.The reported clinical profiles varied among different geographical regions and there was a scarcity of data of COVID-19 in our scenario. Thus we aimed to describe the epidemiological and clinical profiles of COVID-19 patients admitted at Bheri Hospital, Nepalgunj, Nepal.
Methods: A retrospective cross-sectional study was conducted from September to November 2020, among COVID-19 cases admitted at Bheri Hospital. The sociodemographic data, clinical features, comorbidities, treatment and outcome data were entered in Microsoft Excel and analyzed using statistical package for social science (SPSS) version 20.
Results: Of 428 patients 58.87 % were male with 66.5% of patients in 20 to 50 years age group. Fever (75.70%) was the most common symptom followed by cough and myalgia with 69.15%, 44.15% respectively. Diabetes (11.21%) and hypertension (9.57%) was common comorbidities. Deranged liver enzymes (AST 44%, ALT 46%), followed by neutrophilia (39%), lymphopenia (32%) were common laboratory findings. Patchy infiltrates, ground glass opacity and consolidation were common X-ray findings with 13%, 10%, and 9% respectively. Remdesivir was used in 8.17%, convalescent plasma therapy in 2.1% and both in 5.67% of the patients. 22.18% patients required ICU admissions. The case fatality rate was 0.86% within the study period.
Conclusions: This study demonstrates that middle-aged patients with pre-existing comorbid conditions present with relatively severe COVID-19 disease and have poorer outcomes.

Keywords:- *COVID-19; Clinical Profile; Epidemiological Study; Pandemic.*

I. INTRODUCTION

The ongoing COVID-19 pandemic is a contagious viral infection caused by Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1,2] This is a multisystem disorder with frequently encountered manifestations ranging from fever, fatigue and dry cough and less frequently, headache, dizziness and abdominal pain.[1,3] SARS-CoV-2 most severely affects those that are advanced in age and have comorbidities like hypertension, diabetes, cardiovascular disorders and cerebrovascular disorders.[4] Organ dysfunction and death can occur in severe cases, yet severity seems to be associated with age, sex, and comorbidities.[5]

There was a scarcity of data of COVID-19 in our scenario ever since the first case reported on 23 January 2020. This article aims to provide clinical and epidemiological data of COVID-19 patients in mid-western region of Nepal to provide awareness of current situation and to support the government in making intervention strategies to handle this pandemic at the community and national levels.

II. METHODOLOGY

This is a single-centered retrospective cross-sectional study of Covid-19 patients admitted at Bheri Hospital, Nepalgunj Corona Isolation Ward after being tested positive for covid-19 through Real-time polymerase chain reaction (RT-PCR) testing. It was conducted from September 2020 to November 2020. Ethical approval was obtained from the NHRC (Reg No. 1296) before starting the study. Written consent was taken from individual patients fulfilling the inclusion criteria for this study.

Inclusion Criteria: COVID-19 cases admitted to Bheri Hospital, Nepalgunj from September 2020 to November 2020
Exclusion criteria: Non-Covid-19 cases.

The case sheets of the discharged patients of COVID-19 from the period of September to November 2020 were collected and data was entered in a pre-made working patient study forms. All precautionary measures were followed during data collection from case sheets. Socio-demographic, clinical, laboratory, and radiologic data were collected, including age, sex, nationality, travel history, symptoms, duration of stay, and comorbidities. The data was entered in a

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Microsoft Excel sheet. Descriptive statistics like frequency, percentage were analyzed in SPSS version 20.

III. RESULTS

Data was collected from case sheets of discharged Covid-19 patients. The working patient study form contained all necessary information pertaining to the age, sex, clinical presentation, comorbid disease, etc. 252 out of total 428 patients involved in data collection were males and the remaining 176 were females.

Table 1. Socio-demographic profile of COVID-19 Patients

Socio-demographic Category	Variables	Patients Number	Percentage (%)
Gender wise distribution	Male	252	58.87
	Female	176	41.12
Age group wise distribution	Up to 10 Age group in years	5	11.16
	11 to 20 Age group in years	22	5.14
	21 to 30 Age group in years	97	22.66
	31 to 40 Age group in years	105	24.53
	41 to 50 Age group in years	83	19.39
	51 to 60 Age group in years	58	13.55
	60 years and aboove	58	13.55
Religion wise distribution	Hindu	411	96.02
	Muslim	8	1.86
	Buddhist	6	1.40
	Christian	3	0.70
Occupation wise distribution	Self Employed/Business	87	20.32
	House maker	68	15.88
	Service	54	12.61
	Non-government Job	48	11.21
	Health personnel	46	10.74
	Student	41	9.57
	Labor	17	3.97
	Farmer	16	3.73
	Retired/cannot work	51	11.91
Diet	Vegetarians	65	15.18
	Non-vegetarians	363	84.81
Travel	Abroad	0	0
	In Nepal	36	8.41
	No History	392	91.58

Maximum patients fall in 31 to 40 age group 105 (24.53%) followed by 21 to 30 age group 97 (22.66%) and 41 to 50 age group 83 (19.39). Most of the patients belong to the Hindu community 411 (96.02%), followed by Muslims 8(1.86%) and Buddhists 6 (1.40 %).

Among the admitted patients, 87(20.32%) were self-employed, 68 (15.88%) were house makers, and 54(12.61%) were service holders. Health workers accounted for 46(10.75%) of the infected patients. Only 36(8.41%) of those infected had a history of travel. Most of the patients were non-vegetarians 363 (84.81%),

Clinical Profile

The Covid-19 patients presented with various symptoms. Most of the patients, 415 (96.96%), were symptomatic. Fever 324 (75.70%) was the most prevalent complaint, followed by cough 296 (69.15%) and myalgia 189 (44.15%) (Table 2).

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Table 2. Clinical Profile of Covid-19 Patients

Clinical Profile Category	Variables	Patient Number	Percentage
Clinical presentation	Asymptomatic	13	3.03
	Symptomatic	415	96.96
Clinical presentation: Among Symptomatic	Fever	324	75.70
	Cough	296	69.15
	Myalgia	189	44.15
	Fatigue	183	42.75
	Headache	169	39.48
	Shortness of Breath	145	33.87
	Nausea	138	32.24
	Loss of Smell	58	13.55
	Diarrhea	52	12.44
	Loss of Taste	49	11.44
	Hemoptysis	2	0.46
Co-morbidity	No Co-morbid disease	346	80.84
	Co-morbid disease	82	19.15
Among Comorbidity: diseases	Diabetes	48	11.21
	Hypertension	41	9.57
	Lung disease	9	2.10
	Heart disease	7	1.63
	Chronic kidney disease	4	0.93
	Carcinoma	3	0.70
	Stroke	2	0.46
WHO category of Severity	Mild	13	3.03
	Moderate	320	74.76
	Severe	82	19.15
	Critical	13	3.03
Outcome of Patients	Cured	385	89.95
	Referred out	3	0.70
	DOPR/LAMA	3	0.70
	Expired	37	8.64
Treatment by Remdesivir /Plasma	Remdesivir	35	8.177
	Plasma	9	2.10
	Remdesivir and convalescent plasma therapy (CPT)	26	5.67
	Neither Remdesivir nor CPT	358	83.64

COVID-19 affected people of all age groups and comorbidities. Among them, 82 (19.15%) had a pre-existing comorbid condition with diabetes and hypertension being the most prevalent with 48 (11.21%) and 41 (9.57%), respectively.

The patients were categorized clinically according to the criteria set by the WHO. Most of the patients were moderately ill (320), 82 contracted severe disease and 13 were critically ill. Out of 428 patients, 385 were cured, three were referred to higher center. Three of the patients were discharged on request. A total of 37 patients passed away during the study interval. Remdesivir was used in 35 (8.177%) of the patients, while plasma in 9 (5.67%). Both Remdesivir and CPT were used in 26 (5.67%) of the patients, while 358 (83.64%) patients neither require Remdesivir nor CPT.

Laboratories Profile

On admission, 89 (20.79%) of the patients were anemic, 168 (39.52%) had neutrophilia, and 27 (6.30%) had low neutrophil count. 30 (7.009%) patients had lymphocytosis, while 140 (32.71%) had lymphopenia. Liver enzymes were raised in more than 40 percent of patients, while few had raised bilirubin levels. The lab parameters are presented in (Table 3).

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Table 3. Laboratory Profile of Covid-19 Patients

Laboratory Index	Normal Range	Value	N (%)
Hemoglobin	11 - 16	Above Below	 89 (20.79)
Neutrophil	50 - 70	Above Below	168 (39.52) 27 (6.30)
Lymphocyte	20 - 40	Above Below	30 (7.0) 140 (32.71)
Platelets	1.5 - 4.5 lakh	Above Below	4 (0.93) 86 (20.09)
Random Blood Sugar	70 - 140	Above Below	106 (24.76)
Urea	10 - 40	Above Below	24 (5.60)
Creatinine	0.3 - 1.2	Above Below	27 (6.30)
Sodium	133 - 145	Above Below	2 (0.46) 28 (6.54)
Potassium	3.5 - 5.1	Above Below	3 (0.7) 50 (11.68)
Bilirubin Total	0.11 to 1.4	Above Below	14 (3.27)
Bilirubin Direct	0.1 to 0.5	Above Below	35 (8.17)
SGOT*	5 - 40	Above Below	190 (44.39)
SGPT* *	5 - 50	Above Below	200 (46.72)
*SGOT: serum glutamic-oxaloacetic transaminase **SGPT: serum glutamic pyruvic transaminase			

Radiographic profile

The plain radiograph of the chest revealed patchy infiltrates followed by ground glass appearances and pneumonic consolidations. Few patients presented with Acute Respiratory Distress Syndrome (ARDS) and effusion as well (Table 4).

Table 4. Radiographic Findings of Covid-19 Patients

X-Ray features	Patients number	Percentage (%)
Normal	251	58.64
Patchy Infiltrates	56	13.08
Ground Glass Appearance	44	10.28
Consolidation	42	9.81
Nodular opacity	8	1.86
ARDS	7	1.63
Effusion	4	0.93
Total	428	100%

Hospital Stay in days

Patients stayed in the hospital in isolation during the treatment. The range was from 1 to 34 days. The average stay was 10.69 days, with a total of 4578 hospital days.

IV. DISCUSSION

The present study reported almost all of the hospitalized COVID-19 patients from September to November 2020 and recorded the disease's epidemiological profile and clinical features. The incidence of male was higher than the female, our observation supported the Indian data.[6] The significant fraction of those hospitalized COVID-19 patients in the present study were in the age group of 30-40years, followed by those in the age group 20-30 years and 40-50 years which was supported by various studies. This is indicative of the fact that this novel disease commonly infects the middle-aged and the elderly.[7,8]

We did not not found remarkable outcomes in socioeconomic conditions because the disease affects all subjects irrespective of their faith, poverty, education, and occupation. 46 (10.74%) health workers were affected due to repeated exposure to COVID-19 patients during patient care.

Regarding dietary habits, non-vegetarians were found to be more affected than vegetarians. This is not important as per the WHO view however vegetarian diets are richer in antioxidants, phytochemicals and dietary fibre while simultaneously being low in saturated fat.[9] In this study, 3.03% (13/428) of COVID-19 patients were asymptomatic. Data from Long et al. showed that 20.8% of patients with COVID-19 had asymptomatic infections.[10] Fever(89.5%) was the most common presenting symptom followed by

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cough(80.7%), myalgia(63.5%),fatigue(59.2%), shortness of breath (61.3%) in this study supporting various other studies, [11] whereas cough was observed as the most common presenting symptom by Young et al.[12] Another observational study of 1420 patients with mild or moderate disease indicated that the most common symptoms were headache (70.3%), loss of smell (70.2%), nasal obstruction (67.8%), cough (63.2%), asthenia (63.3%), myalgia (62.5%), rhinorrhoea (60.1%), gustatory dysfunction (54.2%) and sore throat (52.9%). Fever was reported by on 45.4% [13]. This contradicts to the findings of this study.

The most common comorbidities in the COVID-19 patients were hypertension, diabetes, lung disease, and heart disease in aged patients above 50, projecting towards poor prognosis of illness correlating with outcomes of various studies.[8,14] Mortality rates of COVID-19 is higher in the elderly and in patients with comorbid diseases.[15]

Lymphopenia, a cardinal feature of COVID-19, was observed in 32.71% of patients in our study, consistent with the reports by Zhou et al. and Bhatraju et al. in their series.[16,17] The most common laboratory abnormalities observed in the present study were depressed numbers of leucocytes, lymphocytes, lower hemoglobin content, platelets, in addition to elevated total bilirubin, ALT and AST. These laboratory abnormalities are consistent with prior findings in those with SARS-CoV2 infection [18] and even MERS-CoV and SARS-CoV infection.[19] As a whole, these findings suggest that SARS-CoV-2 disease may be associated with cellular immunodeficiency, myocardial and hepatic injury, nutrient consumption, and hypoxemia.[18,19] Our studies found neutrophilia in 39.52% of the cases, which contradicts the findings from previous studies [18,19] while consistent with the findings of Jun Wang et al.[20] Increased neutrophil-to-lymphocyte ratio is present in the most severe disease cases.[21] Neutrophilia predicts poor outcomes in patients with COVID-19.[22] This justifies more severe natures of cases admitted at our center.

Our study shows that lower sodium and potassium levels signify severe Covid 19 diseases, consistent with other study's findings.[23] Elevated glucose levels were found in 24.76%, which is consistent with previous study stating worse prognosis of Covid 19 patients.[24] Radiographs showed bilateral patchy or interstitial shadowing followed by ground-glass appearance and consolidation, similar to another study in Wuhan, China.[25] While another study with an extensive sample size showed bilateral shadowing most frequent findings followed by ground-glass appearance, and interstitial infiltrate being less common finding as opposed to our study.[26]

V. CONCLUSIONS

COVID -19 is a pandemic of high morbidity and mortality. Middle aged patients with pre-existing co-morbid conditions are more effected by COVID-19. Comorbidity is one of the significant risk factors for the progression of the disease to death. Fever was the main presenting symptom, followed by Cough and myalgia. Acute liver disease was found to be more frequent in the sufferers of COVID-19. This study found several markers including elevated neutrophil counts, lymphopenia, thrombocytopenia, hyperglycaemia, low sodium, and low potassium, most likely associated factors linked with disease severity and mortality. Patchy infiltrates were the most common radiological finding. The case fatality rate among the admitted cases was 0.86, higher than the national figures (0.67).

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