ORIGINAL RESEARCH ARTICLE

EPIDEMIOLOGICAL, CLINICAL PATTERN AND OUTCOME OF FIRST WAVE OF SARS-COV-2 PATIENTS IN BAGMATI PROVINCE OF NEPAL

Santosh Adhikari[1,*], Ramesh Adhikari[2], Himanshu V[2], Ram Hari Chapagain[1,5], Bina Prajapati[1,5] , Hari Bahadur Khadka[3], Raj Kumar Dangal[4], Purusotam Shedain[6], Rasmi Tamang[3]

[1]Kanti Children's Hospital, Maharajgunj, Kathmandu, Nepal
[2]Provincial Health Emergency Operation Center, Hetauda
[3]Hetauda Hospital, Hetauda
[4]Kathmandu University Dhulikhel Hospital-Dolakha Hospital
[5]National Academy of Medical Sciences (NAMS), Kathmandu, Nepal
[6]Ministry of Social Development, Bagmati Province

Citation

Adhikari S, Adhikari R, V H, Chapagain RH, Prajapati B, Khadka HB, Dangal RK, Shedain P, Tamang R. Epidemiological, clinical pattern and outcome of first wave of SARS-CoV-2 patients in Bagmati Province of Nepal. Journal of Chitwan Medical College.2021;11(37):107-10.

Peer Reviewed

ABSTRACT

Background: The first wave of COVID 19 pandemic was among all age group with different presentations and outcome. This study done was to explore the social demographics, clinical characteristics, comorbidities and outcome of SARS-CoV-2 patients in Bagmati province.

Methods: A retrospective study was done among the first wave of SARS-CoV-2 positive patients registered during the first wave in provincial Health Emergency Operation Center (PHEOC), Bagmati, Nepal. Data was collected from 14th April 2020 to 15th October 2020. Demographic and clinical characteristics, comorbidities, isolation centers and outcome of Bagmati province were analyzed and described.

Results: Among the 58916 cases; 37045 (62.87%) were male 21871 (37.12%) were female, 4434 (7.52%) cases were below 18 years while 54482 (92.47%) were of older than 18 years. Median age was 36.56 years (IQR 1 day to 108 years). There were 1507 (2.55%) cases having co morbidities while 57409 (97.44%) did not have. There were 48734 (82.71%) asymptomatic cases and 10182 (17.28%) symptomatic. There were cases having fever 2665 (26.17%), loss of taste 2130 (20.91%), loss of smell 2097 (20.59%), cough 1330 (13.06%) and common cold 895 (8.79%) with involvement of respiratory system, gastroenterology and central nervous system. Home and intuitional isolated cases were 55227 (93.73%) and 3689 (6.26%) respectively. Four hundred eighty-seven (6.04%) had travel history within 15 days and 242 (0.41%) died.

Conclusions: In the first wave of the COVID pandemic, most cases were asymptomatic while systemic involvement of CNS; respiratory, gastrointestinal symptoms were common presentation. Mostly patient remained in home isolation, few cases had co morbidity and had good outcome in total.

INTRODUCTION

The world is in the midst of corona virus and covid-19 since the end of Dec 2019. The global pandemic has infected about 168 million and 3.4 million people died.[1] There has been outbreak of second wave pandemic and South Asia being highly affected.[2] Nepal had already entered in the second wave of pandemic and the total population infected with SARS-CoV-2 till 15 May 2021 is 0.5 million while death has crossed 6000.[3] There is a wide range of signs and symptoms developed in the people who have been infected by Covid-19. A wide range of clinical features have been reported from different part of the world.[4]

Nepal has first confirmed case of SARS-CoV-2 on 23 Jan 2020.[5] During outbreak of pandemic, the rate of transmission was not so high but later on when the international migrants started to return back, the number of cases started to increase as government also started the contract tracing.[6] There was lockdown and different strategies applied by government of Nepal to minimize the spread of SARS-CoV-2. Despite these efforts, SARS-CoV-2 was wide spread among the Nepali population.

Nepal had smaller positivity rate for SARS-CoV-2 as compared to US and Europe during the first wave.[7] During the first wave, the burden of SARS-CoV-2 is not small for the countries like Nepal. The clinical etiology and the clinical profile of SARS-CoV-2 have greater variation from the different parts of world.[8] This study was aimed to describe the socio-demographic features, pattern, and outcome of SARS-CoV-2 among the people from Bagmati province.

METHODS

This was a retrospective study designed on subjects presenting with RT/PCR positive for SARS-CoV-2. Those positive cases were recorded in provincial Health Emergency and Operation Center (HEOC), Bagmati. This study was conducted among the population of Bagmati province of Nepal in six months' time period. There are 13 districts (Bhaktapur, Chitwan, Dhading, Dolakha, Kathmandu, Kavrepalanchok, Lalitpur, Makawanpur, Nuwakot, Rasuwa, Sindhuli, Sindhupalchowk and Ramechhap) including the national capital Kathmandu. That population who was tested positive from 14 April 2020 to 15 October 2020 was included in our study.

The ethical approval was obtained from the Nepal Heath Research Council (NHRC Ref No. 2886). Similarly, the approval for the data collection of Bagmati province has been obtained from PHEOC. Subjects who tested RT/PCR positive for SARS-CoV-2 registered in between 14 April 2020 to 15 October 2020 in Bagmati province were included in the study. The data were secondary data. The data were collected by the focal persons in different districts. Those data were collected centrally in provincial HEOC. We collected sociodemographic variables (Age, gender), clinical symptoms, travel history, co-morbidities, isolation sites, outcome of those SARS-CoV-2 patients. Similarly, frequency of co morbidities and outcome was seen among the SARS-CoV-2.

These data were analyzed anonymously. The data set was collected in excels sheet and anonymized. Descriptive statistics were computed for continuous and categorical variables. For continuous variables; parameters such as medians with interquartile ranges were calculated for skewed data distributions and means were computed for normally distributed data. Proportions (percentages) were computed for categorical variables. The median age and the descriptive percentage are calculated. Clinical symptoms of those with positive status of SARS-CoV-2 are analyzed and systemic involvement is seen. All are described in frequency and respective percentage was calculated.

RESULTS

There were 58916 patients who were tested SARS-CoV-2 positive and recorded in between 14 April, 2020 to 15october 2020 from Bagmati Province of Nepal. Among them, 37045 (62.87%) were male and 21871 (37.12%) were female. There were 4434 (7.52%) with below age of 18 years and 54482 (92.47%) above 18 years. Forty-eight thousand seven hundred thirty-four (82.71%) were asymptomatic and 10182 (17.28%) were symptomatic. The total cases from 9 districts (Bhaktapur, Chitwan, Dolakha, Kavrepalanchok, Nuwakot, Rasuwa, Sindhuli, Sindhupalchowk, and Ramechhap) were 8057 where the travel history within 15 days was available. Among the reported cases, 487 (6.04%) had travel history within 15 days where as 7570 (93.95%) had no travel history. There were 55227 (93.73%) people staying in home isolation whereas 3689 (6.26%) people remained in institutional isolation as shown in table 1.

Among the 10182 symptomatic patients; Fever was the commonest complaint. There were 2665 (26.17%) cases having fever followed by loss of smell 2097 (20.59%), loss of taste 2130 (20.91%), cough 1330 (13.06%) and common cold 895 (8.79%) as shown in the table no. 2. This showed the wide range of symptoms in those symptomatic patients. Likewise, there were 5535 (54.36%) cases who reported only single symptom while 1978 (19.42%) complained two symptoms in them. There were 78 (0.76%) patients who were having three symptoms in them while cases having 4 symptoms were 436 (4.28%). There was only 1 (0.01%) patient having more than 5 symptoms. The symptoms found on those patients are classified to systemic.

Among those 10182 symptomatic patients, 2665 (26.17%) cases having fever, respiratory system involved was 2338 (22.96%), gastroenterology system involvement in 1401 (13.75%) and 4277 (42.05%) had Central nervous system involvement.

Table 1: Demographics of SARS-CoV-2 patients in Bagmati Province

Variables	Frequency (%)
Gender *(n=58916)*	
Female	21871 (37.12%)
Male	37045 (62.87%)
Age *(n=58916)*	
Less or equal to 18	4434 (7.52%)
19 years and older	54482 (92.47%)
Symptom *(n=58916)*	
Asymptomatic	48734 (82.71%)
Symptomatic	10182 (17.28%)
Travel history within 15 days *(n=8057)*	
Yes	487 (6.04%)
No	7570 (93.95%)
Isolation *(n=58916)*	
Home	55227 (93.73%)
Intuitional	3689 (6.26%)

Table 2: Clinical features of SARS-CoV-2 patients in Bagmati Province

Variables	Frequency (%)
Symptoms *(n=10182)*	
Fever	2665 (26.17%)
Loss of taste	2130 (20.91%)
Loss of smell	2097 (20.59%)
Cough	1330 (13.06%)
Common cold	895 (8.79%)
Diarrhea	492 (4.83%)
Vomiting	473 (4.64%)
Abdominal pain	436 (4.28%)
Shortness of breath	89 (0.87%)
Myalgia	68 (0.66%)
Headache	50 (0.49%)
Sore throat	24 (0.23%)
Chest pain	22 (0.21%)
Dizziness	14 (0.13%)
Tachycardia	2 (0.01%)
Number of Symptoms *(n=10182)*	
1 symptom	5535 (54.36%)
2 symptoms	1978 (19.42%)
3 symptoms	78 (0.76%)
4 symptoms	436 (4.28%)
More than 5 symptoms	1 (0.01%)
Common Systemic Involvement *(n=10182)*	
Respiratory	2338 (22.96%)
Gastrointestinal	1401 (13.75%)
CNS	4277 (42.05%)

There were 1507 (2.55%) cases having co morbidities among the infected people, there were 242 (0.41%) people died while 58674 (99.58%) recovered from COVID-19 which is shown in table 3.

Table 3: Co-morbidities and outcome of SARS-CoV-2 patients in Bagmati Province

Variables	Frequency (%)
Co morbidity (n=58916)	
Yes	1507 (2.55%)
No	57409 (97.44%)
Outcome (n=58916)	
Recovered	58674 (99.58%)
Dead	242 (0.41%)

DISCUSSION

Pandemic novel corona virus disease (COVID-19) caused devastating effect all around the world. There was huge number of reported cases and mortality during the first wave even in the even in developed countries.[1, 9] Nepal had lesser incidences during the first outbreak. During the early phase of pandemic, fewer symptoms were attributed to COVID. In our study, we observed majority of patients were asymptomatic, only 17.28% of patients were symptomatic with maximum number of fever which was also seen in some studies done in China where there was rapid transmission from the asymptomatic population.[10,11] Bagmati province being the province holding capital of Nepal has largest population and the rate of transmission were high.[12,13]

Our study showed that male was highly infected more than female. This might be due to more mobility and engagement of male population in outdoor jobs as a migrant worker to India and other countries, who returned back home with upsurge of the pandemic. Such observation was also found by Jin et al., where male population was 2.5 more diseased than females.[14]

In our study, the number of cases in pediatric population was less. We observed about 7.3% of PCR positive population were children, which is similar to national data of Nepal which also showed about 8% of child were infected with SARS-CoV-2.[15] In Nepal population load of children is about 40%, but the infection rate of 7.3% among this population in our study shows significantly less infection rate of first wave of SARS-CoV-2 among them. This may be due to early implementation of lock down, outdoor restrictions and closure of school and colleges right from the reporting of second case in country. This finding is similar to the study done by Mehata et al which may be because children are asymptomatic or too mildly symptomatic to draw medical attention, be tested and counted in COVID cases.[16]

In our study, we noted that loss of taste and loss of smell sensations related to central nervous system involvement were distinctly more, which was similar to the findings reported from many European countries. There were significant number of cases who reported cough and feature of upper respiratory disease. The respiratory symptoms were the predominant feature recorded over the world, whereas many European countries including Germany have reported the cases with loss of taste sensation and gastrointestinal symptoms.[8]

In our study, there was wide range of symptoms among the population implying propensity of COVID-19 for multisystem involvement. More than one system was involved among many patients infected with SARS-CoV-2. It has also been shown by the multiple studies done all over the world. Initially COVID-19 was thought to be a respiratory disease, but as infection went on increasing multiple symptoms related to different system were noted.[17] In our study, majority of cases reported single symptoms only, multiple symptoms were far less which may be due to milder form of the disease and lesser number of infections in Nepal during the first wave.

We observed that vast majority of patients stayed in home isolation rather than institutional isolation. In the first wave, vast majority of patients were asymptomatic, and most of symptomatic patients had milder symptoms. So people preferred to stay in home isolation. The stigmatizing fear of being tagged of infectious reservoir, doubt of being neglected and deprived of care during overwhelmed health care delivery system would be another explanation for this preferred home isolation. Similarly, number of patients needing hospitalized care was lesser in the first wave in contrast to second wave of SARS-CoV-2 where there was havoc of cases and people were using great effort to get bed in hospital and oxygen to breathe.[18] There was lesser associated comorbidity noted in our study. This might be due to taking the whole population of infected people as sample rather than symptomatic, hospitalized and critically ill patients. Many of the studies done among the hospitalized patients all over the world have shown many patients with associated comorbidities.[19, 20]

Gastrointestinal symptoms like diarrhea, vomiting and abdominal pain were also noted in many patients. This was also found in European countries. Study done by different people had shown the viral invasion of gastro intestinal mucosa and the GI symptoms like abdominal pain, vomiting and diarrhea in SARS-CoV-2 patients in which rectal swabs were also diagnostic of SARS-CoV-2 infection.[21-23]

The mortality rate in our study was also lesser than rest of the world in the first wave.[9] The prognosis appears good despite the lack of evidences and protocols for the treatment of the infected patients even during the overwhelming havoc created by pandemic. Lower death rate in our study is similar to that shown by the national data as well.[24] The early lock down, lesser number of symptomatic and critically ill patients requiring high supply of health care resources were the major factors for lesser morbidity and the mortality. Data from different studies also shows that the case fatality rate from COVID19 in first wave is less than that from SARS-CoV or Middle East respiratory syndrome–related coronavirus (MERS-CoV) in last decade.[25]

There is some limitation in his study. This study is based on secondary data. There may be recall bias from the patients and

hesitancy to express the symptoms due to the fear of getting isolated and admitted in hospital during the first wave. Similarly, it was self-reporting data collection where the co morbidities and other important variables might have under reported.

CONCLUSION

In the first wave of the pandemic, Male population was mostly infected with lesser affect in pediatric Population. Most cases were asymptomatic with maximum people staying in home isolation. Involvement of CNS; respiratory, gastrointestinal symptoms were common presentation and few had co morbidities. The outcome was good.

ACKNOWLEDGEMENT

REFERENCES:

1. Worldometer. Global data of daily SARS-CoV-2 infected, recovered and dead cases [Internet]. 2021[cited 2021 May 15]. Available from: [LINK]

2. World Health Organization. World Health Organization: novel coronavirus (COVID-19) situation reports [Internet]. 2021 [cited 2021 May 15]. Available from: [LINK]

3. Ministry of Health Popuation, Nepal. Nepal's daily Covid-19 update [Internet]. 2021 [cited 2021 May 22]. Available from: [LINK]

4. Tahir S, Tahir SA, Bin AT, Majid B, Majid Z, Malik F et al. Epidemiological and clinical features of SARS-CoV-2: A retrospective study from east Karachi, Pakistan. Cureus. 2020;12(6):e8679-e. [DOI]

5. Bastola A, Sah R, Rodriguez-Morales AJ, Lal BK, Ojha HC, Shrestha B, et al. The first 2019 novel coronavirus case in Nepal.The LancetInf. Diseases. 2020 Mar;20(3):279-280. [DOI]

6. Dhimal M, Neupane T, Adhikari S, Gyanwali P. Trend of COVID-19 cases and health sector response in Nepal. Applied Science and Technology Annals. 2020 Jan 1; 51-7. [DOI]

7. European Union. Covid -19 status of Europe [Internet]. 2020 [cited 2021 Jan 10]. Available from: [LINK]

8. An agency of the European Union.Clinical characteristics of COVID-19 [Internet]. 2020 [cited 2021 May 15]. Available from: [LINK]

9. Worldometer. Coronavirus (COVID-19) mortality rate [Internet]. 2020 [cited 2020 Nov 21]. Available from: [LINK]

10. Wei-jie G, Zheng-yi N, Yu H, Wen-hua L, Chun-quan O, Jian-xing H, et al. Clinical characteristics of Coronavirus disease 2019 in China. N Engl J Med. 2020 Apr 30;382:1708-1720. [DOI]

11. Liu J, Huang J, Xiang D. Large SARS-CoV-2 outbreak caused by asymptomatic traveler, China. Emerging Infectious Disease journal. 2020;26(9):2260. [DOI]

12. Nepal Government Central Bureau of Statistics. Demographic features of population of Nepal [report]. 2011 [cited 2021 May 15]. Available from: [LINK]

13. Nepal Ministry of Health population. Provincial profile Bagmati province [report]. 2020 [cited 2021 May 15]. Available from : [LINK]

14. Jin JM, Bai P, He W, Wu F, Liu XF, Han DM, et al. Gender differences in patients with COVID-19: focus on severity and mortality. Front Public Health. 2020;8:152. [DOI]

15. Ministry of Health N. Coronavirus disease (COVID-19) outbreak updates & resource materials [Internet]. 2020 [cited 2020 Dec 10]. Available from: [LINK]

16. Mehta NS, Mytton OT, Mullins EWS, Fowler TA, Falconer CL, Murphy OB, et al. SARS-CoV-2 (COVID-19): what do we know about children? A systematic review. Clinical Infectious Diseases : an official publication of the Infectious Diseases Society of America. 2020;71(9):2469-79. [DOI]

17. Dixon BE, Wools-Kaloustian K, Fadel WF, Duszynski TJ, Yiannoutsos C, Halverson PK, et al. Symptoms and symptom clusters associated with SARS-CoV-2 infection in community-based populations: results from a statewide epidemiological study. PLoS One. 2021 Mar 24;16(3):e0241875. [DOI]

18. Amnesty International. Struggling to breathe, the second wave of Covid-19 in Nepal [internet]. 2021 [cited 2021 Jun 10] Available from: [LINK]

19. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, et al. Comorbidity and its impact on patients with COVID-19. SN Compr Clin Med. 2020 Jun 25;1-8. [DOI]

20. Yin T, Li Y, Ying Y, Luo Z. Prevalence of comorbidity in Chinese patients with COVID-19: systematic review and meta-analysis of risk factors. BMC Infectious Diseases. 2021;21(1):200. [DOI]

21. Cipriano M, Ruberti E, Giacalone A. Gastrointestinal infection could be new focus for Coronavirus diagnosis. Cereus. 2020 Mar 26;12(3): e7422. [DOI]

22. Villapol S. Gastrointestinal symptoms associated with COVID-19: impact on the gut microbiome. Transl Res. 2020;226: 55-69. [DOI]

23. Wong MC, Huang J, Lai C, Ng R, Chan FKL, Chan PKS. Detection of SARS-CoV-2 RNA in fecal specimens of patients with confirmed COVID-19: A meta-analysis. J Infect. 2020 Aug;81(2):e31-e38. [DOI]

24. World Health Organization Country Office for Nepal. Situation update #34 - Coronavirus disease 2019 (COVID-19) [report]. 2020 [cited 2020 Dec 08]. Available from: [LINK]

25. Abdelghany TM, Ganash M, Bakri MM, Qanash H, Al-Rajhi AMH, El-hussieny NI. SARS-CoV-2, the other face to SARS-CoV and MERS-CoV: Future predictions. Biomed J. 2021 Mar;44(1):86-93. [DOI]