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Original Research Article

Study of clinical symptoms, comorbidities and hospitalization among COVID-19 patients in telemedicine utilizers

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ABSTRACT

Background: COVID-19, in those with comorbidities, has an increasingly rapid and severe progression, often leading to death. Telemedicine services provided by the tertiary care centre contributed to decrease the burden of mortality and morbidity patterns by providing the health services during this pandemic. To determine the clinical symptoms in the COVID-19 patients. To estimate the comorbidities in the COVID-19 patients. To find the association between comorbidity and hospitalization among the COVID-19 patients
Methods: A descriptive cross-sectional study was conducted among the population who availed for the services of telemedicine. Among the total call data of 9229 a sample of 8638 was obtained. Simple random sampling method used with the help of a pre-designed and pre-tested questionnaire. Data was analyzed using MS excel, SPSS version 19.
Results: Demographic profile of the study population of 8638, Males 5862 (67.86%), Females 2776 (32.13%). It shows significant association between symptoms and RTPCR test results. (X^2 =12.0 df=1 p=0.0005), Majority of patients presented with comorbidities like diabetes and hypertension and there is significant association between comorbidity and hospitalization. (X^2=8.3 df=1 p=0.003)
Conclusions: Screening and health education of people with comorbidity regarding clinical symptoms and RTPCR testing of COVID-19 is very crucial for early diagnosis and intervention. Telemedicine services by various NGO's, Tertiary care hospitals have contributed in providing services with the aim of decreasing the morbidity and mortality due to COVID-19.

Keywords: Telemedicine Services, Comorbidities, COVID-19, Hospitalization

INTRODUCTION

The world health organization (WHO) declared the 2019-20 coronavirus outbreaks a public health emergency of international concern (PHEIC) on 30 January 2020, and a pandemic on 11 March 2020.[1] Telemedicine, in its different forms, has been used to diagnose, treat, or monitor patients with acute infectious diseases like community-acquired pneumonia, upper respiratory tract, soft tissue, or urinary tract infections or bacterial endocarditis.[2] It is believed that it can also be of use in a crisis like the current pandemic SARS-COVID.[3] Confirmed and reported cases of COVID-19 have a wide range of symptoms from mild complaints, such as fever and cough, to more critical cases associated with difficulty in breathing.[4] Some of the most common symptoms include cough, fever, chills, shortness of breath (SOB), muscle aches, sore throat, unexplained loss of taste or smell, diarrhea, and headache.[5] The time from exposure to onset of symptoms ranges from 5-14 days. The highest proportion of severe cases occurs in adults

over 60. Emerging data clearly suggests that, associated comorbidities such as hypertension, diabetes, obesity, cardiovascular disease (CVD), cerebrovascular accident (CVA), chronic obstructive pulmonary disease (COPD), asthma, chronic kidney disease (CKD) and malignancy are often associated with increase in severity and or mortality in patients with COVID-19.[6]

Objectives

The objectives of this study were (a) to determine the clinical symptoms in the COVID-19 patients; (b) to estimate the comorbidities in the COVID-19 patients; and (c) to find the association between comorbidity and hospitalization among the COVID-19 patients.

METHODS

A descriptive cross-sectional study was conducted for a period of four months from June 2020 to September 2020 at Department of community medicine in a tertiary care hospital, Kamineni institute of medical sciences of Nalgonda district, Telangana. The study was conducted among the population who availed for the services of telemedicine through a call center. An NGO managed by group of doctors have collaborated with department of community medicine doctors of a tertiary care hospital (Kamineni institute of medical sciences, Nalgonda district to provide tele consultation services to the patients with COVID-19 during the second wave. The total surveyed population is 9229 of which the final sample obtained was 8638 of all age groups. Written informed consent was obtained from the study participants before obtaining any information from them. Utmost care was taken to maintain privacy and confidentiality. All the data of callers were taken by following the inclusion and exclusion criteria to obtain the final data for further analysis. The data was collected on a pre designed and pre tested questionnaire by interview method in their local language.

Inclusion and exclusion criteria

All the patients who availed the telemedicine services and willing to participate in the study were included in the study. Patients not willing to participate, incomplete information, and not given consent were excluded from the study.

Statistical analysis

Data was analyzed using MS Excel, SPSS Version 19 software package and expressed in tables, charts and proportions.

RESULTS

Majority of the patients among the telemedicine utilizers were males 5862 (67.86%) and feminine patients were 2776 (32.13%) (Table 1). Majority of the patients affected with covid are between 30 to 45 years age and also the least affected were between 75 to 90 and above years old among both male and feminine patients. It is also observed that from children of <15 years up to 60 years old of both male and feminine patients were affected with COVID.

Table 1: Age and gender distribution of the COVID-19 patients.

Age (years)	Male	Female	Total
<15	954	931	1885
15-30	1254	539	1793
30-45	2068	645	2713
45-60	1131	461	1592
60-75	395	150	545
75-90	58	48	106
>90	2	2	4
Total	5862	2776	8638

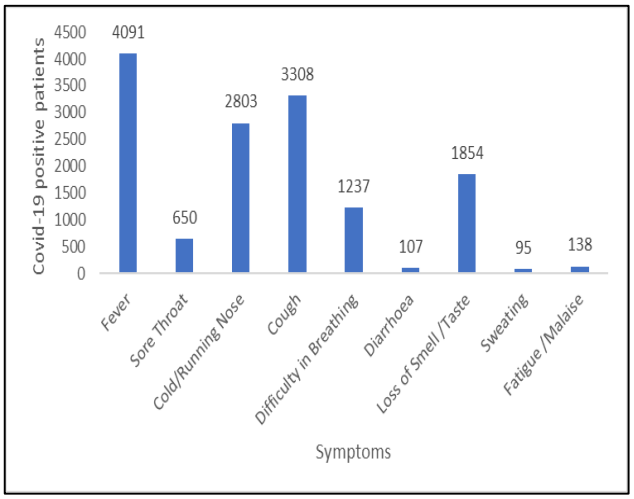

Figure 1: Distribution of symptoms among the COVID-19 patients.

Among all the telemedicine utilizers majority of the patients represented with fever 4091 (28.64%), cough 3308 (23.16%), cold /running nose 2803 (19.62%), loss of smell and taste 1854 (12.98%) and the other symptoms like sore throat, diarrhea, sweating, fatigue/malaise were represented in very few patients (Figure 1). Among the COVID-19 patients majority of patients with comorbidities affected are likely to be hypertension 44%, Diabetes (41%), Asthma and COPD (9%) and very few patients with comorbidities like kidney diseases (2%), heart diseases (4%) are least affected with COVID-19 among telemedicine utilizers (Figure 2). Majority of telemedicine utilizers presented with symptoms like fever (4091), cough (3308), cold (2803), loss of smell (1854) as already mentioned above. It shows significant association between symptoms and RTPCR test results ($X^2 = 12.0$ df= 1 p=0.0005) (Table 2). Majority of the telemedicine utilizers COVID positive presented highest in comorbidities like hypertension (837), diabetes (773), asthma, COPD, respiratory diseases (172) as mentioned

above. There is significant association between comorbidity and RTPCR positivity. (X^2 =4.124 df=1 p=0.04) (Table 3). Majority of the telemedicine utilizers. It shows significant association between comorbidity and hospitalization in the COVID-19 patients due to comorbidity. (X^2 = 8.3 df=1 p=0.003) (Table 4).

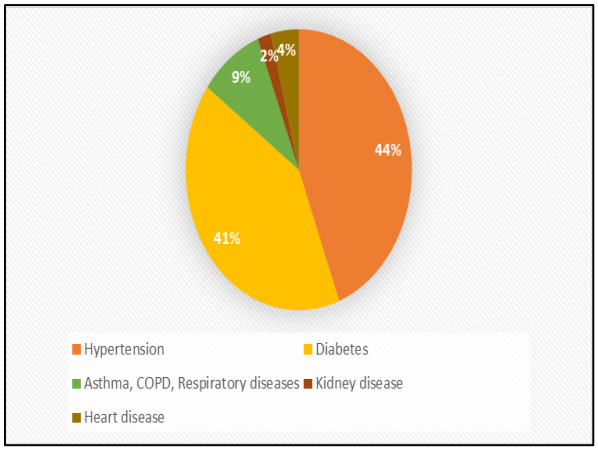

Figure 2: Distribution of comorbidities among the COVID-19 patients.

Table 2: Association between clinical symptoms and RTPCR COVID test.

Symptoms	RT-PCR test results		
	Neagtive	Positive	Total
Present	105 (1.37)	7538 (98.6)	7643 (100)
Absent	28 (2.81)	967 (97.1)	995 (100)
Total	133 (1.53)	8505 (98.4)	8638 (100)

Table 3: Association between comorbidity and RTPCR COVID test.

Co-morbidity	RT-PCR test results		
	Negative	Positive	Total
Present	15 (0.96)	1539 (99)	1554 (100)
Absent	118 (1.66)	6966 (98.3)	7084 (100)
Total	133 (1.53)	8505 (98.4)	8638 (100)

Table 4: Association between comorbidity and hospitalization of COVID-19 patients.

Co-morbidity	Hospitalization		
	No	Yes	Total
Present	1537 (97.6)	37 (2.35)	1574 (100)
Absent	6968 (98.6)	96 (1.35)	7064 (100)
Total	8505 (98.4)	133 (1.53)	8638 (100)

DISCUSSION

Gender and age group

In the present study the total sample size obtained are 8638observed that majority of the patients among the telemedicine utilizers were males among them majority were males 5862 (67.86%) and females were 2776 (32.13%). Whereas in a study of Mohamed Hussain et al among the 444-sample size 192 were males and 252 were females.[7] In a study of Egede et al among 24034 patients 39.6% were males and 60.4% were females. In a study of Nagara et al among the 4582 calls males were 2325 (51%) and females were 2257 (49%) which is similar to the present study.[8,9] In the present study majority of the patients affected with covid are between 30 to 45 years age 2713 (31.4%) and the least affected were between 75 to 90 and above years old 110 (1.26%) among both male and female patients. It is also observed that from children of <15 years up to 60 years old of both male and feminine patients were affected with COVID. Whereas in a study of Rabady et al majority were in the age group 51 to 70 years (36.6%) and 31 to 50 years (34.2%) and the least affected were 70 and above (10.8%).[10] In the study of Martnez et al majority of patients affected with covid were in the age group of 41 to 60 years (30.7%) and least affected were 81 to 91 and above (8.8%).[4]

Symptoms

Majority of patients had complained of fever, cough and are tested positive for COVID, hence screening for fever to be done in suspicion of COVID. In the present study shows among all the telemedicine utilizers majority of the patients represented with fever 4091 (28.64%), cough 3308 (23.16%), cold/running nose 2803(19.62%), loss of smell and taste 1854 (12.98%) and the other symptoms like sore throat, diarrhea, sweating, fatigue/malaise were represented in very few patients. Whereas in the study of Jain et al major symptoms were cough (70.5%), fever (64.1%) and fatigue(44.5%).[11] In a study of Suleyman et al patients presented with fever (68%), cough (74.9%), dyspnoea (60.9%) and other symptoms like vomiting, headache, diarrhea, nasal conjunctivitis are less presented symptoms.[12] In a study of Rabady et al majority present with malaise (49.2%), fatigue (47%), joint muscle pain (49.5%), headache (44.7%) which is not similar to the present study.[10]

Comorbidities

Among the telemedicine utilizers 1896 patients are with COVID positive and associated with comorbidities. In the present study among the COVID-19 patients' majority of patients with comorbidities are likely to be hypertension 44%, diabetes (41%), asthma and COPD (9%) and very few patients with comorbidities like kidney diseases (2%), heart diseases (4%) are least affected with COVID-19 among telemedicine utilizers. Whereas in the study of Ejaz et al majority of covid patients have COPD (52%), diabetes (58%), liver disease (43%), CVD (17%), hypertension (23%) least with renal disease (9%).[13] In the study of Suleyman et al majority of COVID patients present with comorbidities like hypertension (63.7%), CKD (39.3%), diabetes (38.4%), COPD and asthma (26.2%), CAD (12.7%).[13] In a study of Martnez et al majority of COVID patients are with following

comorbidities like hypertension (38%), diabetes (24.9%), CVD (23.6%), COPD (5.7%) which is similar to the present study.[13] COVID-19 patients with history of hypertension, diabetes, chronic lung disease and cardiovascular are leading comorbidities among COVID-19 deaths.

Association between clinical symptoms and RTPCR COVID test

In the present study it is observed that majority of telemedicine utilizers presented with symptoms like fever (4091), cough (3308), cold (2803), loss of smell (1854) as already mentioned above. It shows significant association between occurrence of symptoms and RTPCR test results. (X^2=12.0 df=1 p=0.0005). In the study of Wohl et al among the 1,116 symptomatic adults who were SARS-CoV-2 RNA positive, the most commonly reported symptoms were headache (64.2%), cough (55.8%), muscle or body aches (53.7%), fatigue (51.9%), sore throat (48.8%) and fever (49.1%) where p<0.01% shows significant association between clinical symptoms and RTPCR COVID test.[14] In a study of Narayanaswamy et al among the 1567 COVID positive patient 49.5% symptomatic and 48.5% asymptomatic and shows the significant association between clinical symptoms and RTPCR COVID test shows significant association between occurrence symptoms and RTPCR test, similar to the present study.[15]

Association between comorbidity and RTPCR COVID test

In the present study among the COVID-19 patients' majority of patients with comorbidities are likely to be hypertension 44%, diabetes (41%), asthma and COPD (9%) and very few patients with comorbidities like kidney diseases (2%), heart diseases (4%) are least affected with COVID-19 among telemedicine utilizers. There is significant association between comorbidity and RTPCR positivity. (X^2 =4.124 df=1 p=0.04). In a study of Wohl et al among the COVID-19 patients of 20177 majority of patients with comorbidities are likely to be hypertension 2168, diabetes 936, asthma & COPD 1680 and very few patients with comorbidities like kidney diseases 212, heart diseases 453 are least affected with COVID-19 and shows significant association between presence of comorbidities and testing COVID positive for RTPCR test.[14] COVID-19 patients with history of hypertension, diabetes, chronic lung disease and cardiovascular are leading comorbidities among COVID-19 deaths.[15]

Association between comorbidity and hospitalization of COVID-19 patients

In the present study observed that majority of the telemedicine utilizers It shows significant association between comorbidity and hospitalization in the COVID-19 patients due to comorbidity. (X^2 =8.3 df=1 p=0.003). In a study of Sabatino et al among the 77317 hospitalised covid positive patients 12.86% had CVD, 36.08% had hypertension, 19.45% had diabetes, 11.67% had CAD, 5.30% had COPD with p value=0.019 which shows similar results and association between comorbities and which results in hospitalisation with the attack of COVID.[16] Patients with comorbidities have more chances of hospitalization rather than patients without comorbidities in this study.

Limitations

Limitation of current study was the population of this study is not representative of the entire population. Data on COVID-19 test status were based on self-reporting and may not accurately capture test results. Research on health care use and health outcomes of Telemedicine users is needed to demonstrate the utility of these services in assisting individuals with health decision-making and reducing the burden on the health system.

CONCLUSION

SARS-CoV-2 affected globally a large population with pneumonia-like symptoms, critical situations develop in individuals with hypertension, diabetes, COPD, heart diseases, malignancies, and HIV. The comorbid individuals must undertake vigilant preventive measures to protect themselves during the pandemic.

The individuals with the comorbidities should be vaccinated on a first priority subject to the availability of SARS-CoV-2 vaccine to decrease the chances of hospitalization and severity. Screening and health education of people with comorbidity regarding clinical symptoms and RTPCR testing of COIVD-19 is very crucial for early diagnosis and intervention.

Recommendations

Due to pandemicity people were not able to go to hospitals due to various reasons hence telemedicine services by various NGO's, Tertiary care hospitals have contributed in providing services with the objective of decreasing the morbidity and mortality due to COVID-19. Proper Authorization, accountability and continuous scrutiny and surveillance of these telemedicine services by Higher officials will be useful for the provision of better and quality services to people.

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