

Telemedicine in Times of COVID-19 Pandemic: A Prospective Outcome Study

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ABSTRACT

Introduction: The COVID-19 pandemic was a global threat that affected the economy as well as the health system of our country. Most of the rural areas and outside the urban areas were beyond the proper availability and accessibility of all health services. In this situation, technologies such as telemedicine service played an important role. These telehealth services tried to recover the health system at minimum cost-effectiveness and covered a major part of the population. Telemedicine physicians could reduce the burden on secondary hospitals and advise on the emergency conditions of the patients. The guidelines should be revised to address the weaknesses and establish an ongoing system of evaluation to permit future improvements in the health system. Telemedicine technologies will continue to grow and be adopted by more healthcare practitioners and patients in a wide variety of forms, and these practice guidelines will be a key factor for handling emergency health conditions in the future.

Materials and methods: It was a record-based, cross-sectional study done in the Telemedicine Center at IPGMER, Kolkata, from 1st January to 31st January, 2022. Patients were interrogated by simple questionnaires over the telephone. Real-time reverse transcriptase-polymerase chain reaction (RT-PCR) for COVID-19 antibody-positive or suspected COVID-19-positive patients was included in the study. Patients related to vaccines or enquiring other health-related problems were excluded.

Result: In 92 patients, the mean age was 48.75 ± 4 and there were about equal no. of male and female patients. Among comorbidities, a number of hypertensive, chronic obstructive pulmonary disease (COPD), and diabetes mellitus were more. The duration of symptoms is more in these comorbid patients. Among antibiotics, azithromycin was the most prescribed. The percentage of encounters with antibiotics was much higher than the World Health Organization (WHO) standard. The percentage of drugs from the essential drug list was about the same as the WHO standard. The average consultation time was lower than 7 minutes of the WHO standard.

Discussion: This study showed that comorbidities like hypertension, diabetes mellitus, COPD, etc., affected the duration and severity of COVID-19 symptoms. There were overuses of antibiotics as well as other drugs more than WHO indicators but consultation time was less than WHO indicators. More patients were satisfied with this service than in previous studies.

Keywords: COVID-19, Pandemic, Telemedicine, World Health Organization.

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INTRODUCTION

The COVID-19 epidemic has affected all healthcare systems in the world for the last 2–3 years. This pandemic, like most healthcare systems, has forced people to limit their lifestyles. Therefore, the management of both communicable and non-communicable diseases is greatly hampered. In response to these limitations, new technologies and rapid electronic services have made telemedicine the safest interaction between patients and doctors of all types.¹ Rural and rural villages lack education, skills, and internet services. These services also face many ethical and legal issues that remain unresolved and require appropriate regulation.² However, telemedicine services play an important role as complementary or complementary tools to traditional health care. Rural patients do not need to travel long distances for medical care and treatment. Telemedicine plays an important role, for example, when patients do not need to see a doctor (or other healthcare provider) in person. For temporary, routine supervision or regular care.³ Telemedicine reduces the burden on secondary hospitals. The government is committed to ensuring equal access to quality healthcare for everyone, and digital health has become a complete revolution in healthcare. Therefore, it reduces inequality and barriers to access to healthcare. Some countries have adopted legal and other non-legal measures such as telemedicine guidelines.⁴ In this case, transparency and information for patients and doctors

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are not clearly stated in the telemedicine guidelines. Instructions should explain the patient's consent and registration process during the telephone conversation.⁵ According to previous research, the problems and issues fall into the following categories: Poor internet access and accessibility, privacy, information confidentiality and reimbursement, support such as physical examination and diagnosis, specialists, doctor and patient education, patient-physician

relationship diseases and disease recognition, and uneducated patients.⁶ For this reason, this study was conducted to reveal the problems of the telemedicine sector and to provide suggestions for its use in the future.

OBJECTIVE

- To evaluate commonly given medications during COVID positive patients in telemedicine service.
- To detect any relation of comorbidities with post-COVID symptoms.
- To find antibiotic use in COVID-19 patients.
- To assess drug use by WHO core drug use indicators.
- To measure patients’ satisfaction with a patient’s feedback questionnaire.

MATERIALS AND METHODS

Study Design and Settings

It was a record-based, observational study. The patients’ record from 7th January to 6th February, 2022 was taken from the Telemedicine Center at IPGMER, Kolkata. Random calls of the patients were received by the telemedicine doctors during the COVID-19 pandemic. The records were taken from the telemedicine center, IPGMER by simple case record form and later patients were interrogated by questionnaire method over the telephone.

Sample Size

In this study, 92 cases were selected.

Data Collection

The history and case record of the patients was taken by a simple case record form. After getting the contact number from the records, the patients were interrogated by questionnaire method over the telephone for feedback on this service. All the data were taken in the case record form and the parameters were compared.

Inclusion Criteria

Real-time reverse transcriptase-polymerase chain reaction (RT-PCR) for COVID-19 antibody-positive patients were included in the study.

Exclusion Criteria

Patients’ information related to vaccines or any non-COVID-19 cases were excluded from this study.

Statistical Analysis

The data were first transcribed into a Microsoft Excel spreadsheet. GraphPad Prism version 9 software was then used for statistical analysis. Data had been analyzed by routine descriptive statistics.

RESULTS

During the aforesaid COVID-19 pandemic period, 92 patients were included. All privacy and confidentiality of the data were maintained. The age-group was between 17 and 82 years. Mean age 48.75 ± 4 , coefficient of variance 33.74%. There were 47 males (51%) and 45 females (49%) were included in this study. Among all patients, there was a history of comorbidities in 65 patients. About 37 patients had hypertension (40.2%), 27 patients had chronic obstructive pulmonary disease (COPD) (29.35%), 23 patients had diabetes mellitus type 2 (25%), 8 patients had chronic liver disease (CLD) (8.7%) and 5 patients had chronic kidney disease (CKD) (5.4%) (Fig. 1).

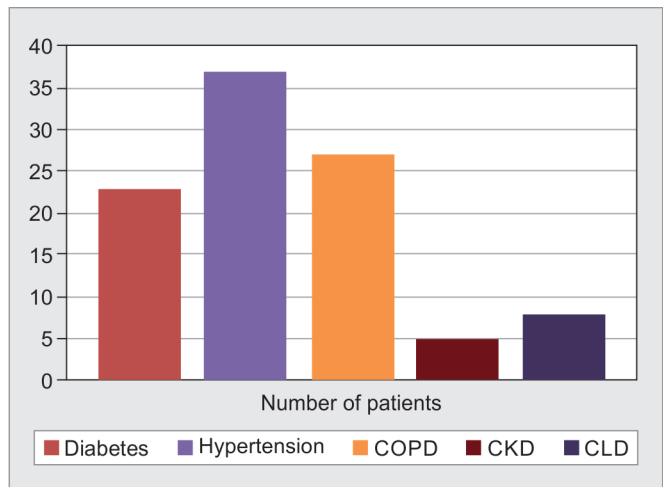


Fig. 1: Different comorbidities in COVID-19 pandemic

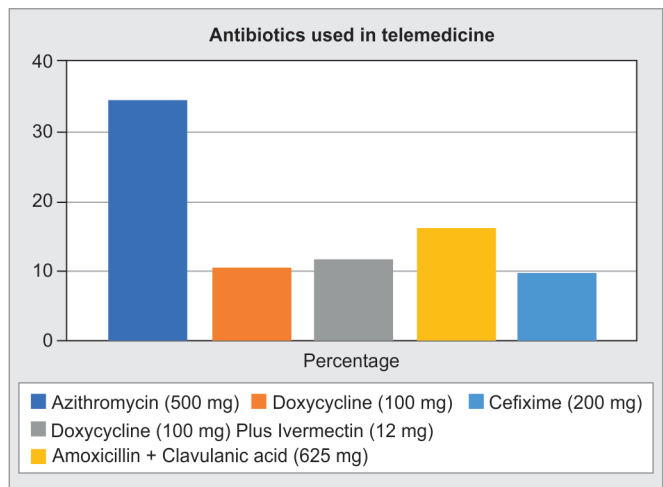


Fig. 2: Different antibiotics prescribed in COVID-19 patients

There were 5 common symptoms found among the patients, i.e., anosmia (62%), loss of taste (56.5%), fever (54.35%), shortness of breath (41.3%), and diarrhea (16.3%). In hypertensive patients, all symptoms duration was more than in nonhypertensive patients except diarrhea. In diabetic patients, duration of fever, anosmia, and shortness of breath were more than in nondiabetic patients. In COPD patients, the duration of fever, anosmia, and shortness of breath were more than non-COPD patients.

Among the received telemedicine calls, 77 (83.7%) patients were advised antibiotics and other medications according to the COVID-19 symptoms, and the other 15 (16.3%) patients were on COVID-19 medications prescribed by previous telemedicine physicians. Among antibiotics, azithromycin 500 mg once daily for 7 days was advised to 32 patients (34.78%), amoxicillin plus clavulanic acid (625 mg) twice daily for 5 days was prescribed to 15 patients (16.3%), doxycycline (100 mg) plus ivermectin (12 mg) was advised once daily for 7 days to 11 patients (11.96%), Doxycycline 100 mg once daily for 7 days was advised to 10 patients (10.87%), and cefixime (200 mg) once daily for 7 days was prescribed to 9 patients (9.78%) (Fig. 2).

DISCUSSION

Among 62 patients, comorbidities were found. Zaki et al. showed that diabetes, hypertension, and cholesterol levels were significantly associated with COVID-19 severity, and kidney disease was strongly linked to the viral infection.⁷ In our study, 40.2% of patients had hypertension; 29.35% of patients suffered from chronic obstructive pulmonary diseases and 25% had type 2 diabetes mellitus.

Previous meta-analytic approaches revealed that more frequent occurrence of certain symptoms like loss of smell, loss of taste, and diarrhea was associated with COVID-19.⁸ In this study we found symptoms, i.e., loss of smell (62%), loss of taste (56.5%), fever (54.35%), shortness of breath (41.3%) and diarrhea (16.3%). In this study, 5 comorbidities were included, i.e., hypertension, type 2 diabetes, COPD, chronic liver disease, and chronic kidney disease. Here hypertensive and diabetic patients showed more symptoms like fever, shortness of breath, and loss of taste and smell. Patients with chronic obstructive pulmonary disease showed more shortness of breath and fever than other comorbid patients.

In a study of antibiotic prescribing in telemedicine service, it was revealed that azithromycin was the most frequently prescribed antibiotic (50.7%), followed by doxycycline (13.0%), amoxicillin (9.4%), and levofloxacin (6.7%).⁹ In this study, oral azithromycin (500 mg) was also the most prescribed antibiotic (34.78%) followed by another antibiotic, i.e., amoxicillin plus clavulanic acid (625 mg) (16.3%), doxycycline (100 mg) plus ivermectin (12 mg) (11.96%), doxycycline (100 mg) (10.87%), and cefixime (200 mg) (9.78%).

A structured data collection tool adopted from the WHO core medicine use indicator (Table 1) was used to collect data.¹⁰ Average no of drugs prescribed per patient was 2.81. The value was slightly higher than the WHO standard (1.6–1.8).¹¹ The percentage of encounters with antibiotics was 83.7% which was much higher than the WHO standard value of 20.0–26.8%. The percentage of drugs from the essential drug list was 98.5% which was the same as the WHO standard.¹² The average consultation time was 7.33 minutes which was lower than 7 minutes of WHO standard.¹³

A cross-sectional pilot questionnaire from a previous study was included to detect patients’ feedback about this study.¹⁴ In that study, about 90% of the respondents said their appointment was scheduled according to their convenience. Additionally, a survey of 1,010 respondents revealed that overall satisfaction with telehealth in primary care was high 91% of respondents were satisfied with video consultations and 86% was happy to focus on phone calls.¹⁵ In this study, 91.3% of patients found the consultation service to be appropriate and 94.6% of respondents were satisfied (Table 2). Only 17.4% of patients had difficulties with telemedicine service which is very much less than in previous studies.¹⁶

Table 1: Core drug use indicators in COVID-19 positive patients in telemedicine

S. No.	Indicators	
1.	Average no. of medicines prescribed per patient encounter	2.81
2.	% medicines by generic names	70%
3.	% encounters with antibiotic use	83.7%
4.	% encounters with essential medicines list (updated WHO list of essential medicine)	98.5%
5.	Average consultation time	7 minutes 20 seconds

Table 2: Patient’s satisfaction indicators

S. No.	Questions	Yes	No	N (%)
1.	Was the service in teleconsultation beneficiary?	84	8	91.3
2.	Was detailed medical history taken before treating you?	86	6	93.4
3.	Are you satisfied with the treatment given in telemedicine?	87	5	94.6
4.	Would you like to recommend this service to your relatives and friends?	90	2	97.8
5.	Did you find any difficulties in the process of telemedicine service?	16	76	17.4

CONCLUSION

This study provides the prospective outcome of the importance of telehealth services in the COVID-19 pandemic. This service helped us avoid direct physical contact and minimized the risk of COVID-19 transmission. Telemedicine doctors can take the patient’s medical treatment, take the history, and prescribe medication based on their symptoms. It becomes affordable, time-saving, and more accessible to many people across the state. People with poor health receive health advice to improve their quality of life. Telemedicine services can reduce the risk of self-medication by prescribing medications appropriately and promptly. There are some problems in this study, in which medications were prescribed based on symptoms of hearing loss without a physical examination. Patients did not track their response to medication. Telemedicine services should be promoted to all regions through practice blogs, email campaigns, and social media. Training healthcare workers will enable them to use new technologies more effectively. Patients need to be taught the technology skills they need to use telehealth services; This can also help improve computer skills and eliminate distractions due to their age and education. Finally, by overcoming all obstacles, this service should be a part of the “triage” plan in the health of the future.

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Ethical Approval

It was approved by Institutional Ethics Committee of Calcutta National Medical College & Hospital.

REFERENCES

- Galiero R, Pafundi PC, Nevola R, et al. The importance of telemedicine during COVID-19 pandemic: A focus on diabetic retinopathy. *J Diabetes Res* 2020;2020:9036847. DOI: 10.1155/2020/9036847.
- Aneja J, Arora S. Telemedicine and ethics: Opportunities in India. *Indian J Med Ethics* 2021;VI(4):314–320. DOI: 10.20529/IJME.2021.042.
- Solimini R, Busardò FP, Gibelli F, et al. Ethical and legal challenges of telemedicine in the era of the COVID-19 pandemic. *Medicina (Kaunas)* 2021;57(12):1314. DOI: 10.3390/medicina57121314.
- Indian Medical Council. Professional Conduct, Etiquette and Ethics Regulation. 2020. Available from: <https://dhindia.org/2020/05/15/>

- regulations-to-amend-the-indian-medical-council-professional-conduct-etiquette-and-ethics-regulations-2002-consultation-by-telemedicine/.
5. Dash S, Aarthy R, Mohan V. Telemedicine during COVID-19 in India— A new policy and its challenges. *J Public Health Policy* 2021;42(3): 501–509. DOI: 10.1057/s41271-021-00287-w.
 6. Ftouni R, AlJardali B, Hamdanieh M, et al. Challenges of telemedicine during the COVID-19 pandemic: A systematic review. *BMC Med Inform Decis Mak* 2022;22(1):207. DOI: 10.1186/s12911-022-01952-0.
 7. Zaki N, Alashwal H, Ibrahim S. Association of hypertension, diabetes, stroke, cancer, kidney disease, and high-cholesterol with COVID-19 disease severity and fatality: A systematic review. *Diabetes Metab Syndr* 2020;14(5):1133–1142. DOI: 10.1016/j.dsx.2020.07.005.
 8. Wang Y, Zhang F, Byrd JB, et al. Differential COVID-19 symptoms given pandemic locations, time, and comorbidities during the early pandemic. *Front Med (Lausanne)* 2022;9:770031. DOI: 10.3389/fmed.2022.770031.
 9. Home of JAMA and the Specialty Journals of the American Medical Association. 2019. Available from: <https://jamanetwork.com/>.
 10. World Health Organization. The rational use of drugs: Report of the conference of experts, Nairobi, 25–29 November 1985. Geneva: World Health Organization; 1987.
 11. World Health Organization. How to investigate drug use in health facilities: Selected drug use indicators. Geneva: World Health Organization; 1993.
 12. Wendie TF, Ahmed A, Mohammed SA. Drug use pattern using WHO core drug use indicators in Public Health Centers of Dessie, North-East Ethiopia. *BMC Med Inform Decis Mak* 2021;21(1):197. DOI: 10.1186/s12911-021-01530-w.
 13. World Health Organization. How to investigate drug use in health facilities. Geneva: World Health Organization; 1993. Available at: https://apps.who.int/iris/bitstream/handle/10665/60519/WHO_DAP_93.1.pdf.
 14. Evaluation of patient and doctor perception toward the use of telemedicine in Apollo Tele Health Services, India. Available from: <https://europepmc.org/article/med/28348994#free-full-text>.
 15. Almathami HK, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine real-time online consultation at patients' home: A systematic literature review. *J Med Internet Res* 2020;22(2):e16407. DOI: 10.2196/16407.
 16. Imlach F, McKinlay E, Middleton L, et al. Telehealth consultations in general practice during a pandemic lockdown: Survey and interviews on patient experiences and preferences. *BMC Fam Pract* 2020;21(1):269. DOI: 10.1186/s12875-020-01336-1.