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RESEARCH PAPER

A retrospective analysis of the type of presentation and management of patients seeking digital consultation services (e-OPD) during the Covid-19 pandemic

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**Bhattacharyya M*

Address for correspondence:
Assistant Professor
Department of Cardiology
CN Centre,
Gauhati Medical College & Hospital, Guwahati, Assam
Email: maitreyee.1990@gmail.com
Mobile: 9101011699

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ABSTRACT

***Background**: The COVID-19 pandemic rapidly altered the mode of delivery of healthcare services to the community. Telehealth services were rapidly implemented to provide uninterrupted healthcare services to the community. **Objectives**: To analyse the type of presentation and management of patients seeking eOPD services during the COVID-19 pandemic. **Methods**: We retrospectively analysed 504 patients in the study who had sought telemedicine consultation (e-OPD services) in the Department of Cardiology from April 2020 to June 2021. The data collection techniques included electronic/print case record forms filled during e-consultation and individual patient data retrieved from the Hospital Information System(HIS). **Results**: The number of new and follow-up cases in the first covid wave (77.6%) was far greater than in the second wave (22.4%). People from both Lucknow and far-off places sought the benefits of telehealth services. More females sought e-OPD services in the first wave (43.5%) than in the second (25.7%). All new and follow-up cases were managed accordingly. Pediatric patients were grossly under-represented during both waves (<2%). **Conclusion**: During the times of the Covid-19 pandemic, when traditional face-to-face cardiac consultations were compromised, telemedicine played a safe, promising, effective and reliable alternative tool to triage and deliver cardiac care to the community without the fear of the spread of Covid-19 infection.*

***Keywords**: Telemedicine; Covid-19 pandemic.*

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INTRODUCTION

The Covid-19 pandemic rapidly altered the mode of delivery of healthcare services to the community. Telehealth services were rapidly implemented in a few weeks to comply with the "stay at home" restrictions imposed across the globe in response to the pandemic.

Telehealth is defined by the Centres for Medicare and Medicaid Services as using telecommunications and information technology to access health assessment, diagnosis, intervention, consultation, supervision, and information across distance. WHO has defined telemedicine as "the delivery of healthcare

services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their Communities."[1] Although telehealth services were widely available in precovid times, utilisation was limited as both the physician and the patient were more accustomed to the traditional practices in medicine, namely history taking and clinical examination. In addition, barriers to its use, namely limited insurance coverage and technical challenges faced by both physicians and patients in accepting telehealth, largely led to its underutilisation in the past.

The Covid-19 pandemic paved the way for optimal telehealth utilisation in providing patients health care services. The services are provided to the concerned patients without the physician's risk of encountering "asymptomatic" individuals. This led to physicians' and patients' widespread acceptance of telehealth services during the pandemic. FAIR Health's monthly Telehealth regional tracker reported a gigantic leap in the use of telehealth services in New York city from less than 1% of the visits in precovid times to as high as 80% during the first wave of the Covid-19 pandemic.[2] A prospective observational study conducted by Omboni S et al. during the Covid-19 pandemic in Italy supported the importance of providing surveillance through telehealth to patients with an underlying chronic condition.[3] A cross-sectional survey conducted in Germany by KnÖrr V, et al. showed a significant increase in the use of telemedicine services during the Covid-19 pandemic and suggested the removal of barriers limiting its acceptance.[4] Another cross-sectional study in Saudi Arabia by H A Alajwari, et al. concluded that telemedicine during the Covid-19 pandemic saved time, labour and costs and was widely accepted by the public.[5]

Telemedicine has also played an important role in dispensing cardiac services. A consensus document of the Spanish Society of Cardiology addressed the issue of telemedicine consultation in cardiology in the Covid-19 era and found that numerous cardiologists adopted telephone and video consultations, email and portable detectors (wearables).[6] A cross-sectional prospective study conducted by Alhadramy OM, et al. found that a structured telephone-based cardiac consultation (TBCC) was a practical, feasible and promising alternative method of delivering cardiac care to the community during Covid-19 pandemic.[7] Marvel, et al., in their study, found that digital health interventions in the form of smartphone applications, smartwatches and blood pressure monitors improved patient health care management and outcomes.[8]

Numerous studies have also been conducted in India regarding telemedicine services during the Covid-19 pandemic. A cross-sectional survey from a quaternary care centre in South India conducted by Ullas et al. concluded that the adoption of telemedicine is a safe and promising alternative because of limited in-person consultations due to the Covid-19 pandemic.[9] A Haleem et al. assessed the capabilities of artificial intelligence in cardiology during the Covid-19 pandemic and found it a helpful alternative.[10] Similar conclusions were also drawn by Kaushik A et al.[11]

To summarise, telemedicine was a viable platform for connecting with patients and providing continued care during the Covid-19 pandemic. It aids the clinical management of patients with cardiac disorders even without in-person visits to the doctor. It is a promising alternative to in-person visits in numerous clinical settings.

The primary objective of the present study was to analyse the type of presentation and the management of patients seeking eOPD services during the Covid-19 pandemic from 2020 to 2021.

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MATERIALS AND METHODS

This institution-based, retrospective observational study was conducted during the Covid-19 pandemic in the Department of Cardiology, SGPGI, Lucknow, Uttar Pradesh. The study population included patients seeking telemedicine consultation (e-OPD services) in the Department of Cardiology from April 2020 to June 2021. The data collection techniques included electronic/print case record forms filled during e-consultation and individual patient data retrieved from HIS (Hospital Information System).

Inclusion criteria: all patients seeking telemedicine consultation (e-opd services) during the Covid-19 pandemic.

Exclusion criteria: none. Ethical approval was obtained from the institutional ethics committee, SGPGIMS, Lucknow, vide ref number 2022-141-DM-EXP-49 dated Jan 23, 2023.

RESULTS

A total of 504 patients were analysed in the study. There were 152 new patients in the first and 61 in the second wave. The median age was 60 in the first wave and 58 in the second wave. More females sought e-OPD services in the first wave compared to the second (**Figure 1**). Most patients (69%) in both waves consulted from a distance beyond 200 km from Lucknow (**Figure 2**). The most common risk factors were diabetes mellitus, followed by systemic hypertension, tobacco chewing, smoking and hypothyroidism.

The most common symptomatology was chest pain in both waves, followed by dyspnea and palpitations. Chest pain was primarily attributable to ischemic aetiology. All patients with rest pain and angina on exertion were advised to seek urgent cardiac care. Patients with atypical angina were advised to undergo electrocardiography (ECG) and treadmill tests and were subsequently reviewed. Patients with nonanginal pain were reassured and advised follow-up. Patients with NYHA IV dyspnea were advised to seek urgent medical help. NYHA II and III were advised diuretic and echocardiography and subsequently reviewed. Patients with complaints of syncope were advised to seek urgent medical care. Palpitations were mostly anxiety-related (**Table 1**).

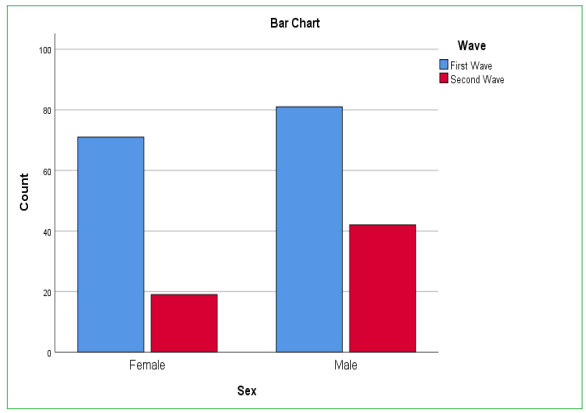

Figure 1 Sex distribution among new patients in first and second waves

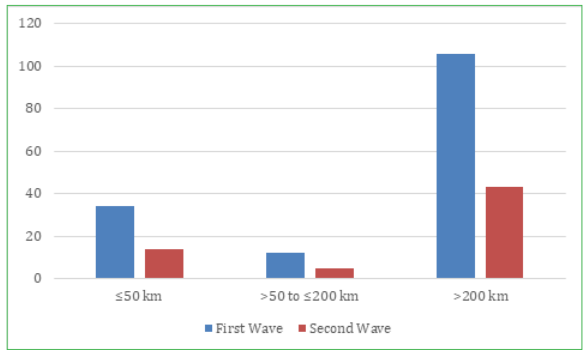

Figure 2 Distribution for distance among new patients in first and second waves

Table 1 Demographics, risk factors and symptomatology of new patients in first and second waves

Category	New patients (first wave) (152)	New patients (second wave) (61)
Age (mean)	60 (55-66)	58 (40.5-65)
Sex	70 (F) 82 (M)	19 (F) 43 (M)
Distance		
≤ 50 km from Lucknow	34	14
>50 to ≤200 km	12	5
>200 km	106	43
RF		
DM	62	28
HTN	45	16
TC	38	11
Smoker	17	4
Hypothyroid	4	1
No RF	44	16
Symptoms		
Non Anginal	6	2
Atypical	21	12
Typical angina	95	35
Dyspnoea	48	22
Syncope	3	2
Palpitations	16	5

Abbreviations: F-Female, M-male, DM- Diabetes Mellitus, HTN- Hypertension, TC- tobacco chewer, RF-risk factors

Based on symptomatology and basic investigations, a diagnosis of ischemic heart disease was made in 47% of the patients in the first wave and 45% in the second wave, mostly presenting as acute coronary syndrome (ACS). Most of these patients in both waves underwent coronary angiography followed by coronary revascularisation either percutaneously or bypass grafting. 17% in both waves had structural heart disease, comprising rheumatic heart disease, degenerative aortic valve disease, and acyanotic and cyanotic congenital heart disease. 7% of patients in each wave were diagnosed with cardiomyopathy. Patients in NYHA I were managed medically and advised regular e-OPD follow-up. Patients with greater severity of symptoms were managed percutaneously or surgically. 2% in each wave had symptomatic high-grade AV block who underwent permanent pacemaker implantation successfully. A diagnosis of stress disorder was made in 3% of the patients in both waves, who were reassured and asked to seek psychiatry consultation. Patients with complaints suggestive of noncardiac aetiology were referred to the respective OPDs (**Figure 3**).

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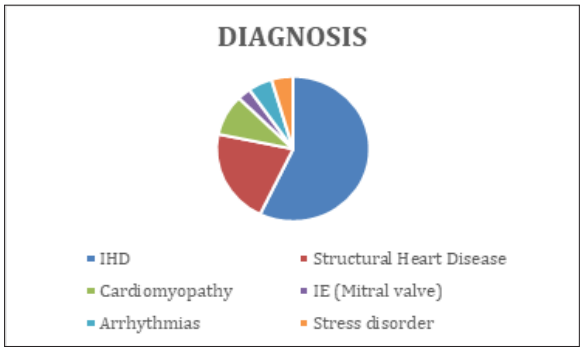

Abbreviations: IHD- Ischemic heart disease, IE- Infective endocarditis

Figure 3 Pie chart showing diagnosis in new patients during first and second waves

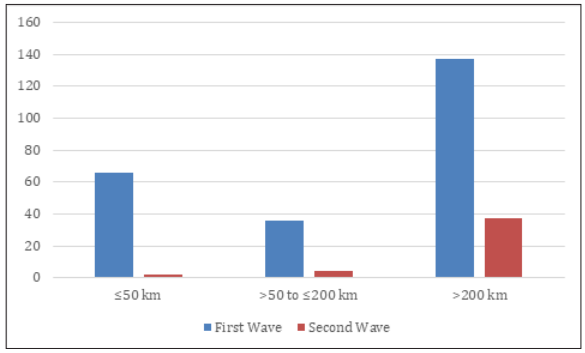

Figure 4 Distribution for distance among follow-up patients in first and second waves

The total number of follow-up patients in the first wave was 239, whereas there were 52 follow-up patients in the second wave. The median age was 62 in the first wave and 60 in the second wave (**Table 2**). Most patients in both waves consulted far beyond 200 km from Lucknow (**Figure 4**).

Among the follow-up patients, the largest category was post-percutaneous transluminal coronary angioplasty patients (PTCA), which comprised 49% in the first wave and 65% in the second wave, all adherent to medical management. Most of these patients were asymptomatic. A small fraction of patients experienced worsening or new symptoms, all of whom were managed medically and advised regular follow-up (**Table 2**).

Table 2 Demographics and diagnosis of follow-up patients in first and second waves

Category	Follow-up patients (first wave) 239	Follow-up patients (second wave) 52
Age (mean)	62 (55-67)	60 (57.25-65)
Sex	F: 100 M:139	F:10 M:33
Distance		
≤ 50 km from Lucknow	66	2
>50 to ≤200 km	36	4
>200 km	137	37
Diagnosis		
CAD Post PTCA	117	34
CAD on OMT	14	3
Post PPI	20	-
Post CABG	3	-
Post MVR	5	-
DCMP	23	2
Post PTMC	26	4
CHD	5	1

Abbreviations: F-Female, M-male, CAD- Coronary artery disease, PTCA- Percutaneous transluminal coronary angioplasty, OMT- Optimal medical therapy, PPI- Permanent pacemaker implantation, CABG- Coronary artery bypass grafting, MVR- Mitral valve replacement, DCMP- Dilated cardiomyopathy, Percutaneous transluminal mitral commissurotomy, CHD- congenital heart disease.

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The post-permanent pacemaker, post-CABG, and post-valve replacement patients were all stable and advised regular follow-up. Few patients of dilated cardiomyopathy and post percutaneous mitral balloon valvuloplasty experienced worsening dyspnea due to non-adherence to therapy; medical therapy was up titrated and followed regularly. Most patients with rheumatic mitral stenosis were stable on medical management. Those who complained of worsening dyspnea despite being adherent to medications were advised to undergo 2D transthoracic echocardiography (ECHO). Subsequently, all of them were advised to undergo mitral valve replacement due to the increasing severity of mitral stenosis. Patients with congenital heart disease who were asymptomatic on medical management were all followed up regularly.

DISCUSSION

This is a retrospective, observational study involving data analysis of the patients who sought e-OPD services during the Covid-19 pandemic in the Department of Cardiology. The number of new and follow-up cases in the first covid wave was far greater than in the second wave. This difference is likely attributed to the fear of infection in the first wave, the relaxation of the lockdown imposed by the government in the second wave and the availability of face-to-face OPD services in our institute. The period of lockdown imposed by the government in the first covid wave was stricter and longer, preventing the public from seeking face-to-face health care and resorting to telemedicine services.[7] The median age of new cases in the first and second waves were 60 and 58 years, respectively, which showed that the paediatric population, which suffers from a unique subset of cardiac disorders, were grossly underrepresented. This could be because of the hesitation of the parents/caregivers to seek health care for the child, as the child cannot seek telehealth services by themself.

A greater number of females seeking e-OPD services during the first covid wave could be because of the higher stress level in females, which aggravated during the first wave, that made them seek telemedicine services.[7] Due to the availability of telemedicine services in our institute, people from within Lucknow and far-off places sought e-OPD services. This highlights the ease of dispensing health care services to the community during the lockdown period without the risk of transmission of infection. Patients were diagnosed based on symptomatology and basic investigations and managed accordingly.

The follow-up patients in both waves were also well-managed.

This study underlines the importance of how a cardiologist/healthcare provider can digitally check a patient's reports during Covid-19 pandemic without coming face-to-face with the patient. This was necessary to avoid unnecessary hospital visits and thus prevent the spread of infection without compromising health services. It also saved the patient's time while awaiting physical consultation as it was provided digitally (through WhatsApp) whenever the doctor considered it necessary.[10] This saved both the patient and the doctor time. All post-procedure patients at the time of discharge were counselled regarding the importance of medication adherence, monitoring of vitals (namely blood pressure, pulse rate and oxygen saturation), development of new/worsening symptoms, and how to contact us for further follow-up. Interestingly, they followed our instructions and contacted us promptly for further visits. None of them had any difficulty in reaching us digitally. The post-PTCA group, which comprised most patients, were also followed by teleconsultation using WhatsApp, which gained a great level of patient satisfaction in addition to adherence to treatment advice, which showed that teleconsultations were as good as face-to-face consultations for this group of patients.[12]

Although there was proper data documentation, this study has numerous limitations. Firstly, although this study was

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mostly telephone-based, with appropriate investigations like cardiac enzymes, ECG, chest x-ray, and ECHO received through WhatsApp, it did not meet the specifications for virtual clinics in which there is remote face-to-face communication with the patients and the availability of the appropriate investigations. Secondly, no investigations were obtained from standard laboratories, as most facilities were shut down during the Covid waves. Lastly, the clinical data obtained from the patients/relatives were highly subjective and could have been over or underestimated by the caregivers/patients themselves. Low literacy rates of patients and caregivers, lack of smartphones and internet connections in rural and remote areas, and lack of standardised web-based applications will likely lead to underutilisation of digital healthcare in our country.[11]

Finally, the doctors advised the least number of investigations and procedures, possibly due to fear of infection and decreased willingness of the patient/relative. Summing up all the advantages and shortcomings of telehealth services during the Covid-19 pandemic, it helped immensely in evaluating, diagnosing, and following up with patients after discharge when social distancing was of prime importance.[13] This could help build a platform for seeking healthcare services in the post-pandemic era.

Study limitations: The study included patients seeking healthcare in the Department of Cardiology, SGPGIMS, Lucknow, during Covid-19 pandemic. A better perception of the utilisation and advantages of telemedicine services at our institute would have been possible by including patients from all departments.

CONCLUSION

In the Covid-19 pandemic, when traditional face-to-face cardiac consultations were compromised, telemedicine played a safe, promising, effective and reliable alternative to triage and deliver cardiac care to the community without fearing the spread of Covid-19 infection. This form of telecommunication health services is particularly invaluable to patients with cardiovascular diseases as it grants them remote and efficient care. This may be a revolutionary tool in dispensing cardiac care, even in the post-pandemic era.

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