

Managing COPD exacerbation at home- Teleconsultations amid COVID-19

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ABSTRACT

Background: Due to an enormous health care crisis arising out of COVID-19 pandemic, alternate methods of seeking treatment like tele-consultation proved useful to patients. We assessed the role of teleconsultation in managing COPD exacerbations at home in the times of COVID-19 crisis. **Materials and Methods:** A prospective study of 527 diagnosed cases of COPD seeking treatment for exacerbation of their illness telephonically because of difficulty in visiting the hospitals created by the COVID-19 lockdown. Data were collected telephonically and via social media platforms from April 7, 2020 to October 29, 2020. The patients were treated for exacerbation and followed telephonically at day 3, 5, 7, 14 and day 30. Patients who turned to be COVID-19 positive were referred to COVID health facility centers. **Results:** 509 patients out of 527 patients were treated for exacerbation of COPD, 18 patients tested positive for COVID-19. Out of 509, 13 patients did not improve and had to be referred to hospital. All of them had acute respiratory failure (Type 2) as documented by their arterial blood gas analysis. 2 out of them did not survive. 496 out of 509 (97.4%) patients of COPD exacerbation were successfully treated via teleconsultations and with a follow-up of 4 weeks period minimum for all the patients. **Conclusion:** Teleconsultation provided excellent means to manage COPD exacerbation remotely with equally effective outcome as seen in hospital care in the times of health care crises due to COVID-19 pandemic.

Keywords: COPD, COVID-19, exacerbation, lockdown, teleconsultation

Introduction

COVID-19 pandemic affected humanity in an unprecedented way; business, economy, health-care, education – all got affected. An enormous healthcare crisis ensued all over the globe and patient care took a huge hit. India also suffered on many fronts due to this invisible enemy. Our healthcare system was put to

a daunting test and the various weaknesses of the system got exposed.^[1] Lockdown, among many other ill effects, had one more serious effect to unfold- making difficult to seek treatment for non COVID patients in the hospitals due to fear of getting COVID infection and also due to lockdown leading to curbs on traffic movements.^[2] Though it was hard to endure, lockdown taught us many things- teleconsultation being one of them. Many patients got their treatment on phone; videoconferencing and mail etc., with satisfactory results emerging out of these necessitating methods.^[3]

Amidst all the chaos and confusion due to the COVID healthcare crisis, we observed a cloud with a silver lining. We present our

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study on how teleconsultation helped our COPD patients in managing them and provided us with an alternate method of dispensing treatment in times of crisis giving rise to a question whether it can be applied in normal circumstances as well!

Materials and Methods

The present study includes data taken prospectively from 527 diagnosed cases of COPD who had previously been diagnosed with COPD on the basis of spirometry and were on follow up treatment from Department of Respiratory Medicine (Government Chest Disease Hospital) Government Medical College Srinagar- a tertiary care hospital for respiratory disease in Jammu and Kashmir – an intermountain region of North India. The patients in the study included those patients who had called the authors telephonically for seeking possible medical attention because of inability to visit the department as our hospital was designated a COVID specific tertiary referral hospital as notified by the government. Confirmation of their diagnosis and status of COPD was done from their previous prescriptions and spirometry results which they were asked to provide before treatment via modems of social networking applications. All the teleconsultations were done for free without charging the patient for any consultation fee as our institution is a state government run hospital.

Defining COPD exacerbation in the study population

In the present circumstances patients were deemed to have an exacerbation of COPD on the basis of:

Asking the patient telephonically about increase in their day to variation of symptoms which had forced them to increase their daily routine medication and had not provided enough relief and hence to seek medical attention which would transpire into -any increase in cough, breathlessness, sputum production or change in consistency of sputum that was not present previously.^[4]

Patients who had a history of contact with a COVID-19 case or with a strong suspicion of COVID infection, were asked to undergo COVID screening, and those who turned out to be positive were advised to visit COVID health facility.

Patients with additional complaints of palpitations, new onset swelling of feet, and decrease in urine output were advised to have an ECG and chest x ray done from a nearby health facility to look for concomitant heart failure. Also, patients in whom possibility of heart failure could be ascertained from history, previous episodes of admission for cardiac related illness and any evidence of such a possibility from available investigations were not included in the study.

Data were collected from their previous prescriptions that included age, diagnosis of COPD, severity of airflow limitation, baseline spo₂ values, any exacerbations in the last calendar year, use of home oxygen, compliance to prescribed medications and any underlying comorbidities. Previous history of admissions

to hospital was enquired to know about the frequency of exacerbations and their spirometry results and prescriptions were used to assess the severity of COPD in them as defined by GOLD guidelines in terms COPD I, II, II, IV. For acute exacerbation all the patients were started on short acting bronchodilators (inhaled SABA/SAMA combination) along with continuation of their maintenance medication prescribed to them earlier. Short acting bronchodilators (inhaled SABA/SAMA combination) were given as nebulized medicine in all the patients keeping in view the fact that the patients had already used DPI/MDI with spacer at home themselves for relieving symptoms but with minimal response and difficulty in inhaling and holding the device during exacerbation, so a change in drug delivery method would be apt and lesser effort is needed as compared to DPI or MDI.

Since we could not do bed side-clinical examination of the patients and had to rely on the patients' history as conveyed to us telephonically, we could not assess the exact nature and severity of the exacerbation, so short acting bronchodilators (inhaled SABA/SAMA combination) were given were given for a period of 7-10 days extending maximum up to 2 weeks and all the patients were given antibiotics for 5 days and systemic steroids in the form of prednisolone 30 or 40 mg or equivalent of other steroids for a 5-7 days. Patients were also asked to monitor their SpO₂ at room air and those with <88% oxygen saturation, were advised domiciliary oxygen therapy. Frequent monitoring was advised.

Follow up

Patients were followed telephonically on day 3, 5, 7, 14 and at day 30 of starting of treatment. On day 3, patients were re-assessed in terms of their symptom profile and oxygen saturation. If patients had signs of improvement, treatment was continued and regular follow up was done as formulated. If on day 3, patients showed no significant improvement, but also did not worsen, frequency of inhaled medications was increased and rest of the treatment was continued. They were asked to get an X-ray chest along with baseline investigations and managed accordingly. Reassessment was done on day 5. However, if on day 3, symptoms worsened with a fall in SpO₂, patients were immediately asked to report to the nearest health facility. We tracked the course of their disease progression telephonically.

Results

527 diagnosed cases of COPD were included for this study. 381 patients (72.29%) were males as compared to only 146 (27.18%) female population. 408 patients (77.41%) were more than 60 years old. Patients with history of contact with a COVID-19 case or predominant upper respiratory symptoms were advised to undergo COVID -19 RT-PCR testing. 33 patients were advised testing out of which 18 turned to be positive by RT-PCR and they were referred to a proper COVID care hospital. Majority of the patients had moderate airflow limitation – GOLD 2 (29.4%) and GOLD 1 (28.5%) followed by GOLD 3 (21.6%)

and then GOLD 4 (20.49%) respectively. The clinical profile of the patients is shown in [Table 1].

The baseline spo2 of the patients was also checked from their previous prescriptions and a note of the presenting spo2 was also made by asking the attendants/patients to check for spo2 levels using an oximeter and then regularly. Patients with their spo2 levels are given in [Figure 1] below:

For subjective assessment of dyspnea, MMRC Dyspnea Scale was used. The results at day 1, day 7, day 14 and day 30 are as shown in [Figure 2 and Table 2]:

Over the course of these months, these patients were followed telephonically. None of them had developed another episode of worsening of their symptoms till the time of writing this article.

Discussion

The aim of this study was to assess the role of teleconsultation

Table 1: Clinical profile		
	Frequency	Percentage
Patients with increased cough, dyspnea and sputum production-	426	80.8%
Patients with increased cough, dyspnea and sputum production and fever	68	12.9%
Patients with predominant upper respiratory symptoms/suspected COVID-1919	33	6.26%
Patients who turned to be covid-19 positive	18	3.4%

Table 2: mMRC dyspnea grading at different days of follow up				
mMRC	Day 1	Day 7	Day 14	Day 30
1	0	31	58	63
2	33	177	267	331
3	273	222	131	77
4	203	79	40	25
Total patients	509*	509	496**	496

*18 patients were COVID positive and referred to COVID facility. *Denotes 13 patients in the said group did not improve and had worsening/persistent symptoms and they were referred to hospital. 9 out of them had acute type 2 respiratory failure as evident in their blood gas analysis done in the hospital. 2 patients did not survive out of these 13 patients

in acute exacerbation of COPD studied amid COVID-19 lockdown, assess response of these patients and their follow up. Teleconsultation is defined as synchronous or asynchronous consultation using information and communication technology to omit geographical and functional distance. It helps in diagnosing and treatment of patients by the healthcare provider when the two are geographically separated.^[5] Role of telemedicine gained much importance during the COVID-19 crisis and its benefits became much prudent as the COVID engulfed the entire globe.^[6] Due to travel restrictions and lockdown imposed to curb the spread of COVID-19 disease, non COVID patients found it difficult to seek medical advice.

In this study we assessed telephonically 527 patients of COPD exacerbation who could not attend to health facilities albeit lockdown and travel restrictions. Out of 527 patients 18 patients who turned out to be COVID positive and were not included in study. Thus total of 509 patients were treated out of which 13 of those COPD patients who did not improve were referred to a hospital, out of which 2 patients did not survive). Hence 496/509 (97.4%) of COPD exacerbations could be treated via teleconsultation. Raza, *et al.*^[7] observed that telemonitoring was reliable and over a period of 7 years, 314 patients had 684 videoconferences and only 8% of the patients required a subsequent in-person visit.

At the end of day 30th, we observed that 496 patients in the study were doing fine in terms of both subjective and objective parameters of assessment. 371 (72.6%) patients were initially in the group having a baseline spo2 of >88%; on day 1 of assessment, Spo2 had fallen significantly in 274 (53.8%) of patients to <88% and at day 7th 143 (28%) patients still had so2 less than 88% while around 25% had recovered from hypoxemia along with symptomatic improvement. On 30th day - 341 patients (66.99%) achieved baseline spo2 >88% and were not in need for home oxygen and were able to perform their routine work.

In the pre-treatment assessment 131 (24.8%) patients were having Spo2 of 80 to 88% had been prescribed LTOT but only 46/131 (35.11%) were complaint to therapy. At day 30, 137/509 (26.9% patients) were prescribed LTOT. They were symptomatically better and were prescribed strict adherence to

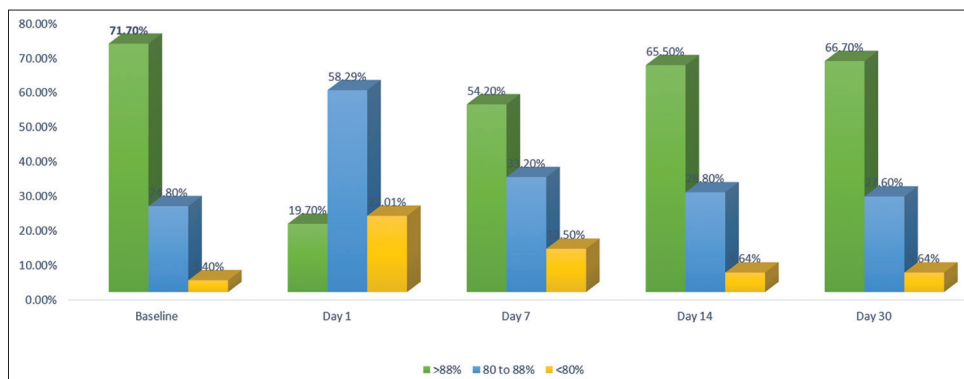


Figure 1: Comparison of spo2 during follow up

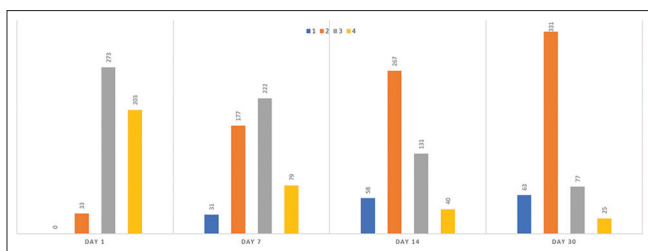


Figure 2: mMRC dyspnea grading during follow up

LTOT to minimize future risks of exacerbation. However, only 84 were compliant to prescribed oxygen therapy whereas 53 were non-compliant to home oxygen therapy. 42 of these non-compliant patients did not use oxygen after day 30 stating they were better now and 11 used oxygen intermittently as per their will.

18 patients before this current exacerbation under study had spo₂ <80% and at day 30 of evaluation post teleconsultation treatment, 29 patients had spo₂ <80%. They are being followed closely.

It is pertinent to note that out of the 13 patients who had to be shifted to hospital for further management, 2 have developed worsening of symptoms again at home after discharge from hospital. Subsequently they tested positive for COVID-19 giving a possibility of having contracted COVID during the first hospital stay. None of the patients treated telephonically have so far developed any further worsening of symptoms, however they need to be followed for more time to see for future worsening if any. Trappenburg JCA, *et al.*^[8] and Vitacca M, *et al.*^[9] have reported fewer exacerbations in COPD patients who were telemonitored. Gaveikaite *et al.*^[10] in their study on telehealth options in Greece concluded that it may encourage healthcare professionals to implement TH-supported services as part of routine COPD management.

Therefore, teleconsultation is a helpful method during this period of pandemic to ensure best possible management for the non COVID patients. However, a regular telephonic follow up is must in order to assess the progression of the disease. This approach can be carried forward even when the pandemic is over and will help to reduce the burden on the hospitals, as this is evident from our study that most of the exacerbations can be managed at home. For this, educating the patients and their attendants about the disease is required so that intensive monitoring can be done.

The main advantages of our study include:

- (i) Data were obtained from the patients in real time and processed first hand by the healthcare providers (authors) without any intervening barrier to minimize bias of interpretation
- (ii) The data obtaining process and dispensing of required health care support was done in the same setting thus saving time which is crucial in treating and diagnosing of an exacerbation of COPD

- (iii) A major advantage was that patients had not to report to healthcare facilities in most of the cases resulting in less chances of getting COVID-19 disease as hospitals were the hot beds for COVID-19 spread.

Limitations

1. Bedside examination of the patients was not possible
2. Radiology was not available in patients and thus possibility of missed pneumonia/pneumothorax/effusion or other diseases could have been missed
3. Investigations like ABG, blood count were also not available.

Relevance to primary care physician

As first contact of patients with any ailment is a primary care physician, so teleconsultation will be very helpful for any primary care physician dealing with COPD patients. Our study clearly demonstrated that more than 90% of patients of COPD exacerbation could be managed by tele-consultation and also first contact in our study were mainly the post graduate trainees. Besides as COVID-19 pandemic has not yet been fully over due to repeated surges if disease caused by mutant strains and poor vaccination acceptance. This has made it even more difficult for COPD patients to receive specialist care and get hospital admission at the time of exacerbation. This clearly shows how tele-consultation is important for primary care physicians and this further decrease the load for specialist care.

Conclusion and Summary

Tele-consultation provided excellent means to manage COPD exacerbation remotely with equally effective outcome as seen in hospital care in the times of health care crises due to covid-19 pandemic and simultaneously avoiding risk of getting of deadly covid-19 infection associated with visiting frequently to the hospitals. So we are of the opinion there is a much larger scope for tele-consultation in delivering healthcare to the patient with various other diseases as a “time and cost saving” procedure both for the patients and the overburdened hospitals.

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Conflicts of interest

There are no conflicts of interest.

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