

Use of Telehealth Data in
Multidisciplinary Team Review of COPDGhassan A Hamad^{1*}, Michael Crooks² and Alyn H Morice³¹General Practitioner and a Senior Clinical Fellow, Centre for Cardiovascular and Metabolic Research (CCMR), University of Hull, Castle Hill Hospital, East Yorkshire²Centre for Cardiovascular and Metabolic Research (CCMR), University of Hull, Castle Hill Hospital, East Yorkshire³Head of Centre for Cardiovascular and Metabolic Research (CCMR), University of Hull, Castle Hill Hospital, East Yorkshire

Article Information

Received date: Nov 10, 2015

Accepted date: Dec 11, 2015

Published date: Dec 14, 2015

*Corresponding author

General Practitioner and a Senior Clinical Fellow, Centre for Cardiovascular and Metabolic Research (CCMR), University of Hull, Castle Hill Hospital, Castle Road, Cottingham, East Yorkshire,
Tel +44 (0) 1482 624066,
Fax +44 (0) 1482 624068,
Email: g.hamad@hull.ac.uk

Distributed under Creative Commons
CC-BY 4.0

Keywords COPD; MDT; Multidisciplinary Team; Telehealth; Telemonitoring

Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a significant illness that lends itself well to telehealth – the remote monitoring of patients at home. Currently, COPD telehealth is usually led by community nurses. Given the multifaceted needs of patients with COPD, we argued that a Multidisciplinary Team (MDT) approach is a better way of holistically managing patients on telehealth. We present our experience of working as part of a community MDT to review patients already undergoing COPD telemonitoring. We collected data on the MDT activity during a six months period with the aim of highlighting deviations from best practice. The MDT prospectively reviewed 95 patients and issued 141 recommendations which were fed to the patient's usual General Practitioner (GP) or directly implemented by the telehealth staff. We concluded that a multidisciplinary review of COPD telehealth patients is feasible and has the potential to add value to what is largely a technology-led service.

Introduction

In recent years there has been a growing interest in the use of information and communication technology to promote health and support self-management. With an increasing burden of chronic diseases, there is a real potential for the appropriate use of technology to shift healthcare delivery from costly secondary care facilities to community settings thus bringing care 'closer to home' [1]. Telehealth - the remote monitoring and care of patients at home - was heralded as a means of providing care in remote communities. However, more recently it has been seen as a method of supporting patients with specific chronic illnesses that are prone to periodic exacerbations [2]. It is hoped that by detecting the initial signs of exacerbations the appropriate actions can be taken in the community to avoid lengthy hospital admissions.

Chronic Obstructive Pulmonary Disease (COPD) is one of the chronic illnesses that lend itself well to telemonitoring [2]. It is a chronic respiratory condition chiefly caused by smoking and manifests as progressive breathlessness, cough and excessive sputum production. In England alone, around one million patients are diagnosed with this condition [3]. The direct cost to the NHS of providing care to COPD is approaching a billion pounds a year, largely related to the cost of hospital admissions [4]. An exacerbation of COPD is one of the most common reasons for hospitalisation with an estimated 1 in 8 admissions due to COPD, making it the second largest cause of unplanned admissions in the UK [5].

In its current form, COPD remote monitoring involves daily collection of the pertinent vital signs and responses to symptoms questionnaires from each patient on the caseload. A typical COPD telehealth kit consists of peripheral devices to collect the vital signs, e.g. blood oxygen saturation, connected to an electronic platform (e.g. a tablet or a smart phone). An alert-generating algorithm embedded in the telehealth software is also needed to automate the process of flagging up patients with impending exacerbations. The vital signs measurements and the response to the questions are collected and transmitted on a daily basis to a team of telehealth nurses using the internet technology. The telehealth team nurses will examine the transmitted data for each patient and make judgements about the possibility of looming exacerbations. Patients deemed at high risk will be directly contacted and their care escalated according to agreed protocols. At present most telehealth services are coordinated by community long-term conditions nurses with limited contribution from clinicians with expertise in respiratory medicine. Furthermore, liaison between General Practitioners (GPs) and telehealth teams remains an issue in many parts of the UK [6]. This situation is unfortunate given the potential of telehealth to facilitate the provision of holistic evidence-based management for COPD sufferers.

Given the complex and multifaceted needs of patients with chronic diseases such COPD, we argue that a Multidisciplinary Team (MDT) approach to telehealth is the best mechanism to respond to

patients' needs and plan their future care. A MDT is a team composed of members from different backgrounds and expertise. The members collaborate to make treatment recommendations and care plans that are unlikely to be accomplished by health professionals working in isolation [7]. It has been suggested that benefits of a multidisciplinary working in healthcare settings may include [7]:

1. Increased patients' satisfaction: this may be the result of the patients' perception that their care is being managed by a team of experts rather than a single clinician.
2. Greater likelihood of the delivery of care in accordance with best evidence: this is because the team is able to call on the expertise of a variety of healthcare professionals thus producing an optimal "package" of care.
3. Better communication allowing easier access to services vital to the delivery of best practice [8].

This is a report on a real life telehealth service to highlight potential benefits of implementing a MDT style review of patients receiving COPD telehealth. We specifically aimed to highlight deviations from best practice that could be corrected by using a MDT approach.

Table 1: A breakdown of the MDT recommendations in the order of frequency.

Recommendation	Total Number	Who to action? (Number)
Advice regarding Inhaler device and dose changes	25	GP(25)
Osteoprotection or osteoporosis investigation	17	GP(17)
Referrals to Smoking Cessation clinics	15	GP(1), Telehealth(14)
Referrals to Pulmonary Rehabilitation	13	Telehealth(13)
Advice regarding oral Theophylline dose / monitoring	10	GP(8), Telehealth(2)
Advice regarding oral steroids appropriateness	8	GP(8)
Reduce threshold for oxygen saturations	8	Telehealth(8)
Advice to optimise mental co-morbidity management	6	GP(6)
Advice to commence long term antibiotics	6	GP(6)
Referrals to oxygen assessment	6	Telehealth(6)
Advice to optimise physical co-morbidity management	6	GP(6)
Anti-reflux therapy or referral to the local Cough Clinic	4	GP(4)
Sputum analysis recommendation	3	GP(3)
Referrals for up to date Spirometry	3	GP(2), telehealth(1)
Review inhaler technique	2	Telehealth(2)
Stop an item of telemonitoring (BP, temperature)	2	Telehealth(2)
Advice regarding Carbocysteine	2	GP(2)
Highlighting the lack of COPD codes on records	2	GP(2)
Influenza Vaccination recommendation	1	GP(1)
Referrals to palliative care	1	Telehealth(1)
Referrals to dietician	1	Telehealth(1)

Abbreviations: MDT: Multidisciplinary Team; GP: General Practitioner; BP: Blood Pressure; COPD: Chronic Obstructive Pulmonary Disease

Methods

In collaboration with our local Telehealth service, we set up a MDT comprising a GP, a respiratory physician, a community pharmacist, the local telehealth practitioners and community long term condition nurses. The telehealth service has already been established for two years prior to establishing the MDT so the majority of patients reviewed by the MDT have been managed by the telehealth team.

In this report we prospectively collected data on patients reviewed in the first six month cycle from November 2013 to April 2014. The MDT panel met once every week to review six to ten patients, allocating between twenty to thirty minutes for each patient. The MDT reviewed patients' telemonitoring data, electronic hospital records and GP medical records, provided that permission to access the records was granted by patients and their GPs. In line with standard MDT reviews, no direct contact with patients during the discussion was deemed necessary but patients' views and experience of telehealth was usually communicated to the MDT members through the telehealth practitioners and the community nurses. Any recommendations endorsed by the MDT were either sent to the patient's GP for consideration or implemented directly by the community nursing team after discussion with the patient.

Given the non-interventional nature of our research and the use of non-identifiable patient data, no ethical approval was sought. As part of receiving the telehealth service, patients have already consented to their data to be used anonymously for evaluation and research purposes. They have also consented for their data to be reviewed by the telehealth team and that liaison with the patients' GPs would take place as required to optimise their medical management. No separate consent was therefore needed for this study. Simple statistics were used to highlight and categorise the MDT recommendations.

Results

In total, 95 patients (52 male) with a mean age of 64 years were prospectively reviewed in the COPD telehealth MDT. The MDT has access to three types of records: the patients' GP records, which contain details of the patient's medical history including medication and hospital episodes, the telemonitoring records, which contain the COPD daily monitoring data, and the patients' electronic hospital records containing additional information about hospital attendances and past investigations. Some GP patients' records (16/95) were not accessible by the MDT as a result of GPs or patients not authorising the share of records with the telehealth service. When GP shared records were not accessible, only telemonitoring and hospital records were reviewed.

In 18/95 there were no GP recommendations or actions to be taken by the telehealth team. Of these 18 patients, 10 have no shared records. For the rest of the patients (77/95): a total of 141 clinical recommendations were made, 91/141 was recommendations to GP and 50/141 were actions to be undertaken by the telehealth team. The breakdown of the recommendations is presented in table 1.

The MDT has also advised on the appropriateness of continuing with telehealth and the recommendations are presented in table 2.

Discussion

Although MDT working is well established in other healthcare

Table 2: MDT recommendation for suitability for continuing telemonitoring.

Recommendation	Number of patients	Reason (Number)
Continue telehealth	75	Telehealth helps the patient to remain stable (75).
Discontinue telehealth	10	- Patients' demand (3/10). - Noncompliance with telemonitoring (3/10). - Very stable condition (3/10). - Patient has no COPD (1/10).
Step down to a less intensive form of monitoring	10	Clinically stable patients(10)

Abbreviations: MDT: Multidisciplinary Team; COPD: Chronic Obstructive Pulmonary Disease.

disciplines its implementation in telehealth settings is, to our knowledge, new. This is due to the fact that telehealth itself is a novel way of delivering healthcare with nascent models of working. Some of the tasks that the MDT undertook were:

1. To confirm the diagnosis and establish the severity of COPD;
2. To carry out a comprehensive medication review following national and local prescribing guidelines;
3. To assess the need for referrals to the local respiratory services linked to COPD management such as the oxygen service, pulmonary rehabilitation and palliative care;
4. To liaise with the patients' GPs regarding any further investigations.

This analysis of the MDT activity for patients undergoing telemonitoring from COPD gathers insight on the additional yield in patient management from introducing a multidisciplinary clinical input into what is largely a technology-led service. The MDT panel reviewed patients against a set of established national and local guidelines. Despite the relatively small number of patients and the short duration of follow up, 141 recommendations were made as per table 1. These recommendations can be grouped under 4 major headings which are discussed below:

1) Suitability for commencing or continuing telemonitoring:

Telehealth is an expensive intervention. A recent analysis concluded that "Telehealth does not seem to be a cost-effective addition to standard support and treatment" [9]. Currently there is a lack of guidance on selecting the most appropriate candidates for telemonitoring and most telehealth services are contracted by healthcare commissioners to recruit a target number of patients. In our experience, having a valid diagnosis of COPD and willingness and ability to use the technology appear to be the main criteria to be eligible for receiving telehealth. Our MDT members discussed each case individually to establish the justification of commencing and/or continuing the provision of telehealth based on the COPD severity assessment, admission episodes and prior knowledge of the patients' characteristics and the level of social support they have.

2) Addressing deviations from best practice:

The MDT reviewed patients' management according to the best available evidence and made recommendations regarding the choice of inhalers and medication doses, the appropriateness of referrals to evidence based therapies such as oxygen assessment and pulmonary

rehabilitation, the suitability for osteoporosis protection and monitoring certain blood drug levels.

3) Reinforcing preventative therapy:

The MDT made evidence based recommendations to prevent exacerbations of COPD and slow the rate of disease progression by encouraging vaccinations and referring COPD patients who continue to smoke to the local smoking cessation services. Although these are part of GP work, the MDT was another suitable vehicle to reinforce this practice and was able to initiate referrals in the majority of cases without increasing the burden of work placed on primary care.

4) Highlighting co-morbidities to the patients' GPs and suggesting therapeutic options:

Members of the MDT have frequently discussed illnesses that usually impact on the general wellbeing of patients with COPD and highlighted these issues to the patients' GPs. It is well known that patients with COPD have a higher than normal incidence of heart diseases, gastro-oesophageal reflux and mental health issues [10]. These illnesses can negatively impact on COPD management. The MDT panel has not infrequently issued recommendations to help optimise the management of such co-morbidities or suggested referrals to secondary care services as per table 1.

Conclusion

Telehealth is an emerging concept of treating patients holistically in the community thus avoiding lengthy hospital admissions. COPD telehealth is a new way of reaching patients at the severe end of the COPD spectrum and to implement evidence based practice. However, this will require better participation of clinicians from different backgrounds working in collaboration to facilitate the implementation of care in line with national and local guidelines. This report of real life data highlights the feasibility of integrating MDT reviews as a vehicle to deliver evidence-based, patient-centred care in telehealth settings. It also highlights the potential of multidisciplinary working to add value to what is chiefly regarded as a technology-led service. Further work is needed to quantify the cost-benefits of adopting this approach in telehealth for COPD and other chronic diseases. Further work is also needed to assess the acceptability of telehealth MDT recommendations to patients and primary healthcare professionals.

References

1. Sibbald B, McDonald R, Roland M. Shifting care from hospitals to the community: a review of the evidence on quality and efficiency. *J Health Serv Res Policy*. 2007; 12: 110-117.
2. Steventon A, Bardsley M, Billings J, Dixon J, Doll H, Hirani S, et al. Effect of telehealth on use of secondary care and mortality: findings from the Whole System Demonstrator cluster randomised trial. *BMJ*. 2012; 344: e3874.
3. Health and Social Care Information Centre. Quality and Outcomes Framework Achievement. Prevalence and Exceptions Data 2012/13. 2013.
4. British Thoracic Society. Burden of lung disease – a statistics report from the British Thoracic Society. 2006.
5. British Lung Foundation. Invisible lives: Chronic Obstructive Pulmonary Disease (COPD) finding the missing millions. 2007.
6. Hamad GA, Morice AH. Telehealth in COPD: the GP Perspective. *J Int Soc TelemedHealth*. 2014; 2: 54-60.

7. Mitchell G, Tieman J, Shelby-James T. Multidisciplinary care planning and teamwork in primary care. *Medical Journal of Australia*. 2008; 21; 188: S61-64.
8. Kuziemyky CE, Borycki EM, Purkis ME, Black F, Boyle M, Cloutier-Fisher D, et al. An interdisciplinary team communication framework and its application to healthcare 'e-teams' systems design. *BMC Medical Informatics and Decision Makin*. 2009; 9: 43.
9. Henderson C, Knapp M, Fernández JL, Beecham J, Hirani SP, Cartwright M, et al. Cost effectiveness of telehealth for patients with long term conditions (Whole Systems Demonstrator telehealth questionnaire study): nested economic evaluation in a pragmatic, cluster randomised controlled trial. *BMJ*. 2013; 346: f2065.
10. Hillas G, Perlikos F, Tsiligianni I, Tzanakis N. Managing comorbidities in COPD. *Int J Chron Obstruct Pulmon Dis*. 2015; 10: 95-109.