Narrative Review

Is telemedicine a golden opportunity or a dangerous roundabout for chronic rheumatic diseases? A narrative review

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Abstract

Introduction: Telemedicine (TM) reported a great increase from 50% to 150% in health care to Rheumatic and Musculoskeletal Diseases (RMDs) patients during the COVID-19 period, yet conflicting opinions in the literature are still present.

Aim: to investigate the papers published on TM in terms of feasibility (patients' satisfaction, accessibility, clinical outcomes and barriers), discussing its integration for the future under a nursing perspective during the COVID-19 period.

Methods: the team that conducted the narrative review was composed by two rheumatology and research nurses and a rheumatologist, who discussed the relevance of the research question and agreed on the search strategy. Pubmed and Google Scholar databases were searched. The inclusion criteria were: original and quantitative research papers in English with available abstract/full text, on adult patients with RMDs in accordance with the American College of Rheumatology (ACR) and/or European Alliance of Associations of Rheumatology (EULAR) classification criteria, exposed to any kind of technologies during COVID-19 period, investigating any kind of patient/clinical reported outcomes

Results: TM could be considered as an integration to standard clinical care in Rheumatology, especially for patients with a stable or low disease activity rheumatic diagnosis; however, the choice of the candidates and the assessment of their E-health literacy level are necessary prior including them in TM programs. In addition, healthcare professionals need to be trained in this new modality of providing care.

Conclusions: hybrid models of telehealthcare might be a balanced solution, improving efficiency of the consultation,

continuity of care and providing a patient-centred approach.

Keywords: Telerheumatology, Telemedicine, Telenursing, COVID19, Rheumatic diseases, Rheumatic and Musculoskeletal Diseases

Introduction

Patients with chronic and autoimmune conditions, such as Rheumatic and Musculoskeletal Diseases (RMDs), are at higher risk of infection not only for COVID-19 but also for the morbidity and the complications that ensues1. During the last two years, the increased risk of infection has been stressing out healthcare facilities for both patients and healthcare providers[2], thus other strategies to assure continuous health care were needed, especially for chronic patients.

Authors from Asia, Europe and USA, reported an increase from 50% to 150% of remote and telematic health care to RMDs patients during lockdown periods[3,7]. Indeed, despite the very demanding aspect of the reorganization of the care model during this period of stress, telematic care was used to maintain and ensure continuity of the long-term path[3,7].

The origins of the term Telemedicine (TM) first appeared in the field of Rheumatology in 1995 with Chase et al., claiming to provide rheumatic counselling to patients in the Texas state prison system[7,8]. Then, specific factors have supported the development of tele-healthcare over the years such as aging, the growing prevalence of chronic diseases, financial shortages for health-care resources, a greater demand for flexibility of care and, finally, the restrictions of the pandemic.

Nelson et al., in their review, aimed to assess the use of tele-healthcare in the management of RMDs patients before COVID-19 pandemic, to compare with newer and similar interventions adapted during the crisis. They identified non-inferiority of tele-healthcare interventions (telephone consultation, videoconference and mixed methods) in 46% of the studies when compared with standard care, in terms of effectiveness. However, the wide variety of measured outcomes and the patients' clinical diversity limited the conclusions and the comparability between the era pre and post COVID-19[2]. Moreover, the high levels of patients' acceptance of TM during COVID-19 pandemic is supported by the reduction of travel costs and the loss of working days, while maintaining the relationship with the healthcare system and the quality of interaction with healthcare providers[7,9]. Bos et al. reported that most of patients agreed or strongly agreed to use TM as a follow-up modality, but informative data are still not sufficient to draw strong conclusions on the efficacy of TM in Rheumatology, especially with regard to Patient Reported Outcomes (PROs) and diseases differing from rheumatoid arthritis (RA). In particular, when remote consultations were supported by e-PROs, many rheumatologists indicated that a single annual physical visit would be sufficient for patients with stable or low disease activity conditions[9].

During the pandemic, Metha et al. reported that 98% of rheumatologists made changes to their clinical practice and 82% of them still use TM to ensure continuity of care. Although tele-rheumatology is potentially expanding in daily practice, in some cases, patients still lack the most basic resources required for a telehealth visit. Indeed, 17% of them stated that at least a quarter of their patients may struggle with economic issues and do not have access to TM10. Accordingly, in the USA, Roberts et al. reported that a high percentage (41.4%) of Medicare beneficiaries did not have access to a desktop or laptop computer with a high-speed Internet connection at home, and 40.9% did not have a smartphone with a wireless data plan[11].

As for the feasibility of switching standard consultation to teleconsultation, Shenoy et al. interviewed 100 Indian patients in a rheumatology clinic and found that 51% depended on a caregiver (family or friends) for the use of technology; 44% of patients chose to stop seeking medical care, and 30% acknowledged that they would self-medicate if TM was not available[12].

Clearly, disparities in access to TM could produce disastrous disruptions in medical care, limiting the ability for many patients to use it but, at the same time, tele-rheumatology would seem not to register significant differences between the e-PROs and the PROs during face to face visitsin terms of disease activity, quality of life (QoL) and satisfaction with the care regardless of those monitored by rheumatologists or by

rheumatology nurses[7, 9, 13].

Thus, the aim of this narrative review was to describe feasibility of TM during the COVID-19 pandemic; in fact, the authors wonder whether TM should be considered a golden opportunity or a dangerous tool for the management of RMDs patients.

Methods

The team that conducted the narrative review was composed by two rheumatology and research nurses (MRM, KEA) and one rheumatologist (MMC), who discussed the relevance of the research question and agreed on the research strategy and the inclusion criteria. Pubmed and Google Scholar databases were searched.

The research question was formulated according to the PEO methodology (Population, Exposition and Outcomes) as reported below:

P: rheumatic diseases (adults, any kind of diagnosis)

E: telemedicine or telehealth or teleconsultation (any kind of technologies)

O: any kind of patient/clinical reported outcomes

We included original and quantitative research papers in English with available abstract/full text, on adult patients with RMDs in accordance with the American College of Rheumatology (ACR) and/or European Alliance of Associations of Rheumatology(EULAR) classification criteria, exposed to any kind of technologies during and after COVID19 period, investigating any kind of patient/clinical reported outcomes. The search string, composed by the identified key words was: "rheumatic diseases" AND ("telemedicine" OR "telehealth" OR "teleconsultation") AND "patient reported outcomes".

Two independent reviewers screened the identified records for eligibility through titles and abstracts; data were finally extracted from the full texts included in this review. The strength of the evidence, evaluated with a critical appraisal approach (critical appraisal skills program –CASP tool for observational studies and for RCTs), guided the discussion and the conclusions of the review. The results are discussed in narrative mode, considering the feasibility of TM according to the following key points: (I) main types of existing health technologies; (II) patients' point of views (satisfaction, accessibility, clinical and QoL outcomes); (III)barriers for the implementation of telehealth; (IV)integration for the future and nursing perspective.

Main types of exsisting health technologies

The main types of health technologies employed in the included studies were:

- ***interventions via web*** (i.e. websites, digital platforms): Richter et al. studied the effect of a digital platform to which the person with RA can refer to receive holistic care and improve self-empowerment. For remote health monitoring, patients received devices to self-track their blood pressure and weight. The devices transmitted data via Bluetooth to a commercially available Android™ tablet with an integrated SIM LTE (long term evolution) card that was also handed out from the study team. Home monitoring data were transferred through the PICASO Integration Platform (picaso-project.eu). In addition, patients used the tablet to access their individual PICASO dashboard for data entry and monitoring their health status and documentatetheir e-PROMS on regular basis[14].
- ***telephone interventions***: Ferucci et al. reported interesting results of a comparison between traditional visits (physically, in the reference clinic) and consultations via telephone, has a positive effect in both situations on the functionality of the person suffering from RA15. Sandhu et al. followed RA patients to observe change in functional status via telephone interview, with positive feedbacks registered[16]. In the same way, some authors bestowed telephone consultation and/or follow-up during the COVID-19 period[17-20].
- ***interventions via video call***: in the study by Bennel et al., the difference between therapeutic education for exercises and weight loss for patients with osteoarthritis (OA) was studied, delivered through video viewing or through TM programsfor exercise, self-management advice and behavioural counseling, included nutritional advice[21]. Other authors reported rheumatological E-visits through the video modality (i.e. zoom platform) during the COVID-19 period of restrictions[15, 17, 18, 20, 22].
- ***smartphone applications***: Kavadichanda et al. sent text phone messages when TM was not possible19. Rafiq et al. randomized 114 patients with knee OA, overweight or obese, to receive reminders by using mHealth to carry on the strengthening exercises of lower limb rehabilitation protocol and instructions of daily care[23].
- ***contact by email***: in some cases, also patients' follow-up through email contact was reported[17].

Patients' point of view

The major outcomes investigated, from the patients' point of view, were satisfaction with the service, accessibility to E-visit, disease activity control and other clinical outcomes.

Hight rates of satisfaction and accessibility were identified from this review: the patients themselves who have used TM, referred to be ready to recommend it to other patients as well[14,17]. Opinc et al. reported a positive attitude of people suffering from RMDs (female 92.6%) with regard to TM (82% of the respondents)17. The study of Howren et al. showed that 58.6% of participants felt supported by their rheumatology care provider(s) during the COVID-19 pandemic, and nearly half (44%) had access to a virtual rheumatology appointment[24].

Danila et al. conducted an online survey among patients with RMDs, assessing the acceptability about TM through the Telemedicine Perception Questionnaire (TMPQ). Of The respondents were 819 (mean age of 58.6 years, female 85.7%); the mean visit satisfaction score was 7.3 (range 0-10), with 25.8% of respondents being very satisfied (scores of 9 or 10) yet, for the following visit, 56.8% of them stated to prefer a face-to-face visit[18].

In general, there were no statistically significant differences in patients' preference among the diverse types of TM, but the development of platforms, applications and telephone/video consultations reported a good level of acceptance[15,17,18,24]. Richter et al. performed a study to optimize care management processes: 89% of users of the platform, after six months, were satisfied with it and, at the end of the project, the majority of RA patients (93%,) would have recommend the platform to others, especially because it gave them a daily overview of their health status14. 82% of the respondents in the study by Opinc et al. preferred telephone consultations[18], while 67.5% of the sample in the research of Danila et al. were young, resided in urban areas, and reported higher levels of satisfaction with the video-call18.

TM is generally well accepted for the safety from infection (very relevant in pandemic times), reduced waiting times and quick response from physicians[17,19,20,22,24]. Also, TM increased the reduction of costs and travel times. The economic impact of TM is a favorable aspect to be considered, not only for the healthcare system, but also for patients and their jobs, given the reduction of the loss of working days[16,19,20]. In the Indian sample interviewed by Kavadichanda et al., the rate of patients' satisfaction with TM was high (76.1 %), especially in terms of cost effectiveness: indeed, patients had to travel, on a median of 82 km (1.6–504 km) even though the closest health care facility was at a median distance of 5 km (0.1–50). Out of the 373 patients, 90% found TM consultation easy to follow and 76% considered it better than in-person consultation in circumstances like the COVID-19 era. However, 16% felt that TM was not as good as in-person consultation[19].

Patients' reasons of not willing to use TM, were: worries about the accuracy of disease activity assessment and diagnosis; worries about data security or sick-leave certificates not provided[20,22]; in particular, 86% of UK patients preferred in-persons visits because of the difficulty in building a long-distance trusting relationship with clinicians and risk of inaccuracy of diagnosis20. Howren et al. performed in their international survey showed that 71.2% of patients (110/154) were satisfied with their virtual appointment. However, 64.5% of the total respondents (277/429) preferred in-person appointment when dealing with difficult news[24].

As regards to clinical aspects, there was no statistically significant difference in the perception of disease activity and QoL measures (i.e. functional status, daily activities) between patients who incorporated E-visits in their care and those who received in-person visit only in short-term follow-up[15, 16, 22]. Rafiq et al., in their 12 weeks study experienced periodic WhatsApp messages as reminders for strengthening exercises protocol and instructions of daily care on Smart phone's mobile health applications. Their results show that QoL (pain, stiffness and physical function), functional strength and functional capacity indices recorded a positive and significant increase in the obese and overweight population with OA[23]. The Functional status of a TM group recruited by Ferucci et al. improved over 12 months (univariate analysis); RAPID3 (Routine Assessment of Patient Index Data 3) score and functional status were associated with TM group (higherin multivariate analysis), with no statistically significant change over the 12-month follow-up; in that period the proportion of visits with the assessment of disease activity was higher in the in-person group (40% versus 25%, not significant after multivariate analysis)15. In contrast, long-term

telematic follow-up in patients with nephritic lupus appears to be associated with higher rates of hospitalization than in patients followed in presence. Neverthless, the higher baseline Patient Global Assessment of TM group could have confounded the results[22]. This data leads us to reflect about the complementary role of TM with in-person visits, especially in patients with higher disease activity.

The monitoring of disease activity is pivotal for RMDs patients and, thus considering to maintain the follow-up appointments despite pandemic conditions, should be part of the standard of care. For instance, in case of stable conditions and/or disease remission, patient education, monitoring of adverse events, drug escalation and treatment adherence are still important[20].

During the pandemic, many patients reported to have dangerously discontinued all or part of their treatment regimen, demonstrating that patient education still need to be addressed[19,24]. Kavadichanda et al. reported that in 88% of cases factors responsible for discontinuation of drugs prescribed were worsened by financial condition, patients'education status and lack of public transport during the lockdown19. Additionally, increased inequalities for vulnerable and/or disadvantaged patients are actual concerns among RMDs patients[20]. Indeed, during crisis, patients belonging to poorer strata of society and with lower educational background are likely to stop medications: thus, considering the switch to a hybrid model of TM and in-person visits is likely to improve treatment adherence with substantial economic return[19].

Barriers for the implementation of telehealth

Consistent with the current literature, our review showed that TM was particularly unsuitable for initial rheumatic diagnoses for the high risk of misdiagnoses and for these conditions of flare-up symptoms and disease activity. According to most of the included studies, this might be due todifficulty of accuracy in-physical examinations and joint count[16,18,20]: 86% of patients interviewed by Sloan et al. refer concerns about assessment accuracy during E-visit as compared to face-to-face visit20. Furthermore, disease activity and satisfaction with TM were associated with higher satisfaction among stable RMDs patients (19.3% vs. 4.5%) and with severe disease RMDs patients (11.9% vs. 4.5%), but, lower satisfaction was registered among those with mild (27.5% vs. 43.5%) and moderate disease activity (41.3% vs. 47.7%)[24]. Therefore, it is not surprising, that in the cohort of Danila et al., 73.7% of RMDs patients who had experienced TM reported to prefer this option when feeling well18. In addition, within remote visits it is likely that patients be reticence to report symptoms[16,20], especially concerning mental health, in which the non-verbal communication (i.e.eye contact, expressive touch, smiling etc.) is particularly effective in making the patient open20. During an E-visit, patients refer to build the relationship with the clinician in a more impersonal way, felt more "rushed"[20].

Also, uncomprensive medical language and illiteracy of the patients emerged as barriers[16,19], combined with different geographical distribution, that remains one of the major problem for the world health care[19].

The bureaucratic and administrative aspects also need to be better defined. The available national Guidelines state that only an outpatient service not requiring a complete examination of the patient may be provided through a televisit. Accordingly, this applys to RMDs patients who require an assessment, both clinical and clinimetric and, a televisit can be carried out only after the first in-person consultation[25,27].

Legal aspects, including privacy and reimbursements, still appear not so clear, thus further and more detailed regulations are needed to define quality standards.

Finally, some authors carried out a reflection on the low evidence present in the literature regarding the feasibility of TM in the rheumatic field, underlining the high risk of bias of the studies, small samples and the non inclusion of all RMDs (i.e. Rheumatoid Arthritis is the most studied RMDs)[15,20].

Integration for the future and nursing perspective

The World Health Organization values TM's role at every stage of providing health services from diagnosis, treatment implementation and maintainance, prevention measures to conduction of clinical research and patients' education[17]. The vast majority of the responders in the study of Opinc et al. thought that teleconsultations should be available also after the end of the SARS-CoV-2 pandemic (88.5%)[17]. In this perspective, TM service could be considered as an integration to standard clinical care in Rheumatology, especially for patients with a confirmed rheumatic diagnosis and in a stable

or low disease activity condition[16, 18, 20, 24].

RMDs patients can generally be located in one of the three phases of diseases course: (I) initial dose-escalation phase requiring tight follow-up for disease activity control and treat to target strategies; (II) the consolidation phase, where the rheumatologist has fixed the dose but, clinical and clinimetric assessments are needed, including treatment's efficacy, adherence and safety; (III) the long-term maintenance phase, where periodic follow-ups and assessments are required at tailored intervals. Patients falling under the latter two groups are the ideal candidates for tele-rheumatology consultations and telenursing follow-up[7, 9, 13, 19].

In the study of Danila et al., experience a remote visit, patients that experienced a remote visit, compared to those who did not, preferred TM (video or phone, independently) for routine visits (73.7% versus 44.3%;), reviewing test results (64.8% versus 53.8%), when considering changing medications (40.5% versus 26.8%) and to discuss medication side effects18. These areas could be of interest for nursing, after standardized protocols. According to nursing daily practice, the rheumatology nurse's contribution can be precious.

The difficulty of a physical examination remains one of the most important barriers for telerheumatology, especially for patients newly diagnosed or with a disease flare[10-12, 15, 16, 19-24, 28-30]: we can affirm that, in such cases, the face-to-face approach is preferable.

Generally, validated musculoskeletal examination manoeuvers have been adapted to self-evaluations, clearly after prior education sessions18. Yet, there still is a lack of guidance on the virtual physical auto examination, together with low-resolution photographs and videos that impair the accurate evaluation of cutaneous lesions and joint assessment.

Virtual care quality could be improved by developing an interprofessional collaborative approach and designing customized electronic health infrastructure to support information exchange and communication between health professionals[24].

To date, remote consultations are considered unsuitable for new patients, the elderly, those with language barriers and/or low e-Health Literacy levels and for patients with visual or hearing impairments[5,7,9-13,15,16,19,20,24, 28-30]. However, Danila et al. reported evidences that TM expanded healthcare access to patients with some barriers due to health policy (i.e. insurance coverage) and factors such as age, rural residence, lack of broadband internet, or limited digital literacy[18].

Despite all the previous considerations, inequalities in access to digital technology already existed and, the COVID-19 crisis has just worsened these disparities dramatically. Technology unavailabilty represented a major risk factor of vulnerability during this pandemic, leading to worse clinical outcomes, especially for autoimmune diseases patients[5,7,9-13,19,20,28-30]. Moreover, concrete actions through careful regulation are necessary to ensure maximum confidentiality and privacy of health data and standardize both the terminologies and the different reimbursement schemes.

Hence, integrating E-visits with in-person consultations could represent a balanced approach between the two parties, keeping TM as a complementary "golden" opportunity and, never as a substitute for the in-person visits. Indeed, the choice of the TM candidates and the assessment of E-health literacy level prior including patients in TM programs still lack evidence.

Finally, it is extremely important to identify major symptoms or flares to address patients toin-person visits and to prevent disease complications. Evidence for effectiveness is limited by methodological bias and clinical heterogeneity of telehealthcare interventions.

A careful assessment of the patient to address to TM interventions is required to accommodate protocols, recommendations and Guidelines' reviews directed from international working groups.

Conclusion

TM has been extremely useful during the COVID-19 pandemic, however, there is still a lack of current evidence and recommendation for telehealthcare in Rheumatology. Hybrid models of telehealthcare carried out by a trained professional, included rheumatology nurses, might be a balanced solution, improving efficiency of the consultation, continuity of care and providing patient-centred approach.

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