



The positive side of the coin: Sars-Cov-2 pandemic has taught us how much Telemedicine is useful as standard of care procedure in real life

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Abstract

Patients and health workers were at high risk of infection during the Sars-Cov-2 pandemic lockdown. For this reason, other medical and clinical approaches such as Telemedicine were necessary. Despite Telemedicine was born before COVID-19, the pandemic was the opportunity to accelerate a process already underway for at least a decade and to blow all the barriers away. Our aim is to describe the experience of Telemedicine during and immediately after the first lockdown to assure the follow-up in a ‘virtual’ outpatient clinic dedicated to Rheumatic and Musculoskeletal Diseases (RMDs) and to give an overview of Telemedicine in the rheumatology field. We retrospectively evaluated the patient flow to our rheumatology division from March to September 2020 and, in accordance with local restrictions, three periods were selected. In the 1st period, 96.96% of the outpatient clinic cases were shifted to Telemedicine; these decreased to 52.45% in the 2nd period, while the 3rd period was characterized by the return of the patients at the clinic (97.6%). Diagnostic procedures were postponed during the 1st period, reduced drastically during the 2nd and performed regularly during the third period. Intravenous infusions were maintained as much as possible during the three periods, to assure therapeutic continuity. Shifting stable patients to Telemedicine has the potential to allow continuity of care, while reducing the risk of contagion during a pandemic. In the next future, the integration of Telemedicine as standard of care for specific clinical applications might assure assistance for RMDs patients also in non-pandemic conditions.

Keywords COVID-19 · Rheumatic and Musculoskeletal Diseases · Sars-Cov-2 · Telemedicine

Introduction

The Sars-Cov-2 pandemic and Rheumatic and Musculoskeletal Diseases (RMDs)

In the last 2 years, the COVID-19 has put at the stake the majority of healthcare systems. In particular, the lockdown has imposed worldwide unprecedented restrictions to the clinical standard care of RMDs patients. In Italy, most of the routine activities were cancelled during the streaming of the pandemic in March 2020, prompting a pragmatic reorganization of the traditional clinical activities and care model, thus providing a rapid and efficient response to patients’ needs.

In the literature, the effects of the lockdown on RMDs patients are now documented [1–4]. In fact, the restrictions significantly affected the emotional well-being and favoured the disease relapse [5]. Both these two items have

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been approached with Telemedicine to screen severe symptoms in real time, despite the lockdown. In other healthcare settings, Telemedicine was implemented in response to the pandemic, providing a high patient and provider satisfaction [6]. In particular, Telemedicine represented a valid and useful addition to the follow-ups of rheumatic patients. This evidence suggests that Telemedicine may serve as a new approach for the follow-up of patients with RMDs [7–9]. Consequently, Telemedicine and Healthcare Technologies have clearly become a smart opportunity for the care and management of RMDs to achieve and maintain high standards of quality care during an emergency. All these experiences should lay the foundations for a procedural habit to integrate in everyday practice.

Telemedicine and its use in clinical care: definition and purpose

In 2010, WHO (World Health Organization) has defined Telemedicine as a big opportunity: *‘the delivery of health care services, where distance is a critical factor, by all health care 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 health care providers, all in the interests of advancing the health of individuals and their communities’* [9]. Indeed, Telemedicine was born before COVID-19, yet the pandemic accelerated a process already underway for at least a decade. In the first place, Telemedicine was employed to ensure access to healthcare in rural areas, to easily obtain health services remaining within their local community [10]. Then, Telemedicine has been widely employed in chronic diseases. In Italy, the COVID-19 crisis determined a rapid technological expansion not only for healthcare but also for students attending school lessons, and for the population to maintain relationships with relatives and friends [7].

During the COVID-19 outbreak, Telemedicine has provided a basic medical support to the community, including RMDs patients. Telemedicine also helped patients not to remain isolated and has protected patients and physicians from contact, therefore possibly reducing the chance of cross-infection in hospitals, eliminating social panic, enhancing the public’s self-protection ability, correcting improper medical treatment behaviour and promoting epidemiological screening [7]. Despite its large use, some procedures still await standardization, while several issues such as patient privacy protection, medical insurance, expense reimbursement, data security and doctor’s remuneration still need to be addressed [11, 12].

Ethics in the act of telemedicine

Ethical considerations are mandatory to deal with, when talking about telemedicine, to guarantee a safer use of the services. The ethical aspects of telemedicine are widely analysed in the literature, indeed, most authors have strongly stressed out the protection of patient information, confidentiality, informed consent, physician’s malpractice and lack of specific regulations [13].

As reported by Langarizadeh et al., the ethical issues in telemedicine can be investigated from several aspects, including technology, doctor-patient relationship, data confidentiality and security, informed consent, patient’s and family’s satisfaction with telemedicine services [14].

Moreover, Nittari et al. stated that the use of telemedicine may potentially overcome any kind of organizational and practical deficit. Despite this, it would be a priority to preventively develop and ameliorate those actual shortcomings, in order to assure useful and vital activities for the patient [15].

In our context, regional laws were applied providing a web-based platform to perform the Telemedicine services, in which patients were identified through their Fiscal Code.

Remuneration of the medical consultation

The essential objective of e-health is to contribute to the reorganization of the healthcare system, rationalizing and optimizing the current models, while improving overall efficiency and reducing management costs. Currently, Telemedicine consultations are remunerated according to regional/national regulations, which make them equal to traditional consultations in terms of costs.

In the meantime, a National Study Group on the Economic Evaluation of Telemedicine Services has been established by the Italian Institute of Public Health (ISS) to specifically define cost/effectiveness evaluation models for these services and identify new pricing systems. Moreover, Interim indications for telemedicine assistance services during the COVID-19 health emergency were activated. Numerous variables should be taken into consideration when dealing with the reimbursement of telematic services, such as the technological capacity, the public or private nature and the location of the structures in which these are provided, as well as maintenance costs, the possible reduction of waiting times and of working days loss [16].

Strengths and weaknesses of Telemedicine

We know that Telemedicine allows the continuity of care and follow-ups in time, thus supporting the patients at distance.

This entails real benefits for the health system, in terms of reduction in waiting times and limiting the risk of infection (see Table 1). Moreover, patients were satisfied to maintain the contact with the physician and to reduce the travelling costs and the loss of working days as well [4].

During this period of crisis, patients' compliance to treatment was a critical issue and the risk of treatment interruption was perceived as a main problem. Thus, switching to a Telemedicine-based hybrid model was likely to maintain as much as possible drug compliance, with substantial savings on loss of pay and out-of-pocket expenditure [17].

Some weaknesses of Telemedicine are obvious, like the inability to perform a physical and joint examination and the limited access to the web, in particular for elderly patients. Some patients also showed a psychological and cultural reluctance for online consultations because they preferred the face-to-face visit. Likewise, Telemedicine is not appropriate for patients failing to respond to therapies (see Table 1) [17–19]. In fact, new signs/symptoms and disease flare should not be limited to the Telemedicine approach.

It is likely that the impetuous growth of telemedicine that has occurred in many countries will be confirmed and consolidated even when the pandemic is finally over. Despite this, the majority of healthcare systems neither provided the tools (PC, Phones, cameras, etc.), nor funds and standardized protocols or reimbursement policy to support Telemedicine [17–19]. These limitations might have impacted on the use of Telemedicine despite the pandemic advancement and should be overcome to carefully integrate Telemedicine as a standard of care procedure in the future.

Telemedicine in rheumatology: telerheumatology

The pandemic impacted remarkably on rheumatology practice, from the access to outpatient clinic, to the hospitalization, and even in prescribing anchor drugs. In fact, the restricted access to rheumatology care jeopardized the control of chronic RMDs and their long-term prognosis [19].

In Arab countries, COVID-19 pandemic determines on average 65% decrease in outpatient consultations,

56% decrease in day hospital–infusion centres and a 69% decrease in regular hospitalization, both lowest in the Gulf and highest in North Africa [19]. The rheumatologists interviewed reported using Telemedicine in 70% of the cases, mostly based on traditional telephone contacts and e-mails, and to be reimbursed in 12% of the cases.

Before the pandemic, other studies supported the use of Telemedicine in rheumatology: a tele-monitoring service was implemented in 2012 to deliver healthcare to patients with stable RA and SpA in an outpatient clinic in Singapore [20]. The service was steered by two advanced practice nurses once a week, with up to 50 patients/per month.

During the pandemic, Telemedicine has increased from 10 to 90% of patient contacts in only 1 week. In Australia, a remarkable success was obtained with tele-rheumatology for up to 80% of outpatient appointments [21], while a cross-sectional study conducted in April 2020 in Puducherry (India) reported that 76.1% out of 373 RMDs patients in conditions of poverty considered tele-rheumatology better than in-person consultation. The teleconsultations were limited to telephone calls and photographs shared through WhatsApp [22].

Recently, a positive experience with telephone and video consultations in Italian SLE and psoriatic arthritis patients was reported [23]. From March 11, 2020, all patients affected by RMDs and treated with biological disease-modifying anti-rheumatic drugs afferent to a Rheumatology Unit (Catania) were contacted to evaluate the health status, laboratory test reports and the presence of any adverse events. A nurse administered the clinimetric questionnaires to evaluate the disease activity and the impact of RMDs on the health status.

According to a recent systematic review, Telemedicine was well-accepted by RMDs patients and rheumatologists, while remote consultations were unsuitable for new patients, the elderly, those with language barriers and for patients with only one annual visit [24].

In the Netherlands, a survey among rheumatologists indicated that the missed personal interaction was felt as an unmet need, although less travel time, ease of use of the

Table 1 Aspects of disease manageable and not manageable with telemedicine

Aspects of RMDs manageable with Telemedicine	Aspects of RMDs not fully manageable with Telemedicine
<ul style="list-style-type: none"> ● Continued patient care during pandemic events ● Regular follow up for stable patients ● Patient education ● Clinimetry/Telemetry ● Patient counseling ● Detection of urgent problems ● Drug Adherence and patients' compliance ● Detection of drug-related adverse effects ● Dealing with general practitioners ● Renewal of the therapeutic prescriptions 	<ul style="list-style-type: none"> ● First consultation of complex cases ● Physical/joint examination ● Thorough evaluation of disease flare ● Management of digital lesions

system and shorter waiting period were indicated as the 3 key elements for patients to favour telemedicine [18].

During the first period of the pandemic, 17% of 548 worldwide rheumatologists reported that at least a quarter of their patients might not have access to telehealth contacts because of connections issues, particularly those below the poverty line [25, 26].

Clearly, all these topics should be considered when approaching the use of Telemedicine. Guidelines and recommendations are in fact urgently needed in the field of rheumatology. Today, it is evident that Telemedicine should be managed not only by well-prepared clinicians and Healthcare Professionals (HPs), but also specific guidelines and national rules are urgently needed to guide the development of this emergent area.

Evidence obtained by our experience

In our centre, outpatient visits dropped by more than 60% during the first phase of the pandemic. This reality forcefully prompted the shift to Telemedicine to assure continuity of care with follow-ups at distance for RMDs patients. Data from our Rheumatology division show the pivotal contribution of Telemedicine during the lockdown which tightly restricted the access to the outpatient clinic. The report of our experience was evaluated by the local Ethical Committee (Comitato Etico Area Vasta Centro, Toscana, Italy) and approval was waived because no clinical or demographic data concerning the patients was analysed in the study.

At the beginning of the pandemic, a team of rheumatologists and nurses was set up to revise and study, on a weekly basis, each patients' charts to plan the

Telemedicine sessions. The physical or virtual presence of the patient in the clinic was decided case-by-case and adapted to the patient's needs and preferences, considering also the clinical picture previously discussed by the rheumatology team.

The patients' flow to the outpatient 'virtual' Telemedicine clinic dedicated to RMDs during and immediately after the lockdown was divided in 3 periods according to national indications. Indeed, an almost complete restriction of the access to the hospital was maintained from March 9th to May 18th (1st period) and in the following period up to June the 30th (when limitations of the access to health services were still maintained — 2nd period). During the 3rd period, from June the 30th up to September the 30th, 2020, there were no specific restrictions on the access to healthcare facilities.

From March to September 2020, the number of scheduled infusions performed were 653/913 (71.5%) in the first, 542/542 (100%) in the second and 1.048/1.048 (100%) in the third period.

In the outpatient clinic, the shift to Telemedicine was done in 96.96% of the cases during the 1st period. This number decreased to 52.45% in the 2nd period, while 97.6% of the consultations were carried out in the 3rd period. Diagnostic procedures, such as ultrasound, capillaroscopy, and joint injection were generally postponed during the 1st period, reduced drastically during the 2nd and performed regularly during the 3rd period. Ulcer treatment and the Clinical Trial Unit never stopped their activity. The trend of visits and Telemedicine divided per month is shown in Fig. 1. We observe that Telemedicine increased most in the first period and gradually diminished in the second period, while in the third period, no Telemedicine was activated.

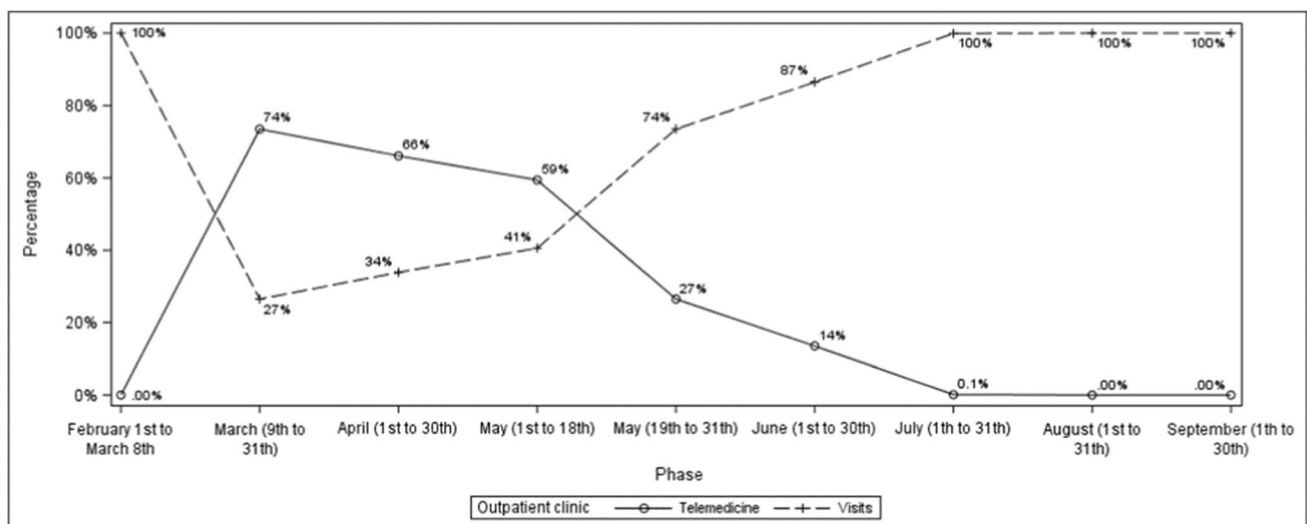


Fig. 1 The percentage of visits and Telemedicine during the SARS-CoV-2 pandemic from February 2020 to September 2020

Indeed, the last period is characterized by medical examination and full access to the centre (Fig. 1).

The reorganization of patient care is the most challenging aspect of adaptation to the pandemic. This may vary depending on local policy, hospital/clinic organization, volume of clinical activity and available facilities/staff [27]. In addition, it is important that patients are adequately informed about COVID-19 signs and symptoms. Our strategy was to assure that patients were adequately informed about COVID-19 manifestations and hygienic rules of prevention, maintaining an optimal communication and cooperation between rheumatologists, nurses and general practitioners [28, 29]. In our cohort, we successfully performed remote laboratory monitoring, as well as switching from intravenous to subcutaneous drug administration and from nurse-led group teaching of subcutaneous drug administration to online teaching supported by written information and video demonstrations. This was possible despite the rapid increase of the pandemic and Telemedicine follow-up consultations for RMDs patients during the 1st and 2nd periods. The evaluation of clinical symptoms and blood tests, as well as drug prescription and psychological support, were the main activities. Conversely, in-person appointments were always guaranteed and prioritized to discuss difficult news related to disease severity, still providing, when possible, the option of telephone or video conference for virtual follow-up.

In this light, at least part of other routine follow-up visits may easily be adapted to Telemedicine, saving unnecessary travel and still assuring patient care [20]. For what concerns patients with ulcers and related complications, it is important to underline how their constant access to the centre despite the pandemic risks has taught us that this kind of clinical issue is difficult to treat at distance and almost always must be directly taken care of. Indeed, for ulcer management and patient education in an outpatient setting, the contribution of Telemedicine should be expanded but still limited despite the fact that it may grossly help through ulcer monitoring by photos or videos. For instance, the patient might need to consult the specialist nurse to provide high-quality care advices and guidance.

Our data show that Telemedicine can be helpful mainly in some areas of activity of a rheumatology division, like the outpatient clinic, where in the future it could be employed also in ‘normal’ conditions for a tight follow-up of stable patients. In our opinion, patients with RMDs are an optimal population target for Telemedicine, as they are usually younger people of working age, with a probably active lifestyle and children. On the other hand, also the elderly or limited-mobility population may benefit from remote visits, allowing greater freedom for the caregiver.

As the biological therapy has changed the progression of these diseases, favouring periods of remission, remote consultations through Telemedicine may lighten the burden

of the disease with more frequent follow-ups. Obviously, the first rheumatology consultation for RMDs patients must still be face-to-face because Telemedicine cannot fully replace the standard clinical approach [30]. Consequently, virtual appointments are the key to reducing stable patients access to healthcare services and preventing the risk of infection, during a pandemic emergency, limiting the exposure bidirectionally both for patients and healthcare providers, still providing a fast track of access for unstable patients with complications and saving unnecessary travel [31].

Conclusions

The pandemic experience has taught us that we need not only to educate the physicians to optimize their Telemedicine approach but also to increase the number of specialized nurses in rheumatology. The healthcare systems should take valuable lessons from these unprecedented events, while rheumatologists and HPs should promptly shape together new strategies with the wise use of healthcare technologies. In the next months, up to the end of 2021, the experience previously accumulated [26, 30, 32–35] will be relevant for the healthcare systems expecting an other potential wave. In fact, Telemedicine should be maintained and gradually included as a dichotomous standard of care tool either in pandemic and standard conditions. Stable or in-remission patients are preferred for a Telemedicine approach, while other cases should be considered for a face-to-face visit.

In conclusion, our experience has taught us that the continuity of patient care is mandatory in clinical practice, and its interruption is not affordable even in a pandemic situation. Also, Telemedicine should be further implemented in the divisions of rheumatology worldwide in the next future.

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Declarations

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