Editorial

Telemedicine for rheumatological consultation: the new semeiotics for rheumatic examination

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In March 2020, the spread of the coronavirus disease 2019 (COVID-19) made the lockdown necessary, thus limiting the access of patients with chronic disease to the outpatient clinics. However, chronic patients continued to need care even in such a difficult period. In that period, the heart of the matter was how to provide health service not only for COVID-19 patients but also for those with other clinical conditions (1). The health care providers started rethinking their approach to obviate the need to meet the patients face to face. At the very beginning of the pandemic, Chinese patients had been invited to seek help online so as to avoid in-person consultation (2). The temporary changes in the access to healthcare have pushed global health-care systems to implement telemedicine systems.

According to the World Health Organisation, the definition of telemedicine (or telehealth) implies the use of telecommunications and virtual technology to deliver health care outside the traditional health-care facilities. Telemedicine can be text-based relying on e-mail, short messaging service or chat-platform, it can use audio and/or video applications and it could expand to include wearable devices and "chatbots" (3).

In rheumatology, telephone *versus* videoconference visits perform differently compared with in-person visits with an agreement of 71% *versus* 97%, respectively, in terms of diagnostic accuracy (4).

Before COVID-19 pandemic, telerheumatology was mostly restricted to patients living in remote areas. Despite still limited, the evidence in rheumatology found telemedicine to be effective in the management of rheumatic diseases and it is an acceptable – sometimes preferred – alternative for most patients (4-6). Most importantly, the incorporation of telemedicine into routine rheumatology care seems to achieve similar results in terms of patient reported outcomes and quality of care (7). Recently, a randomised controlled trial comparing "connected monitoring" and "conventional monitoring" in patients with rheumatoid arthritis starting a new treatment showed that telemedicine allowed to reduce the number of physical visits during the 6 months follow-up without compromising clinical and functional scores (8).

To date, a telemedicine curriculum in rheumatology is not yet available; however, other specialties already provide didactic programs simply relying on participation in synchronous and asynchronous teleconsultations to familiarise with virtual examination and improve residents' virtual care skills (9). We have the unique opportunity to train fellows to new skills such as carry out history and "physical examination" and communicate with patients and health care providers in a virtual format. In their review article, Lockwood *et al.* suggest that telerheumatology training should be offered to rheumatology fellows, but should also be part of continuing medical education for rheumatology practitioners (9).

Herewith, we propose a step-by-step path for the rheumatological evaluation in telemedicine, and a new semeiotic as similar as possible to in-person visit (Fig. 1). The web-based visit could allow patients with rheumatic diseases to be treated at home, with high-level medical support provided virtually.

1. First contact

The first phone contact – a couple of days before the televisit – is necessary to invite and engage the patients who

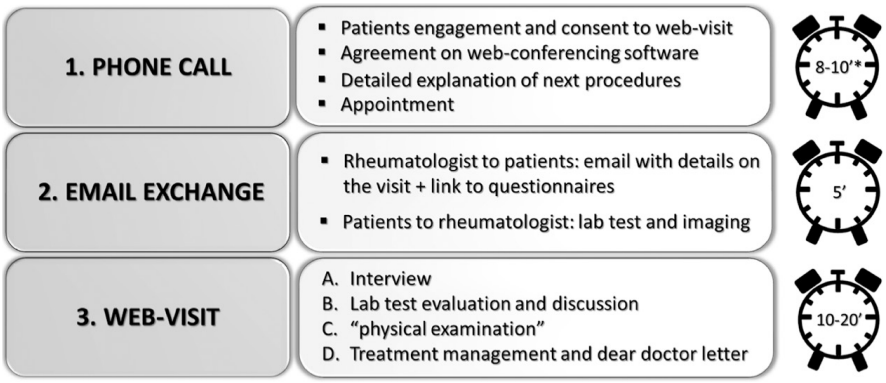

Fig. 1. Smart-visit workflow summarising the three steps of the web-based televisit and the estimated time for each of step.
*estimated time for the phone call before the first televisit.

wish to make the virtual rheumatological visit and to obtain their consent. The trained front office-staff (nurses, employees, rheumatology trainees) explain step-by-step how the visit will be performed. Health care provider and patient discuss the web-conferencing software to use and the way to enter the virtual visit room, depending on the software used. Then, the staff provide the patient with a personal link to join the visit and explains to the patient what he/she is required to do before and after the visit. A test-visit should be performed to address any potential technical issue (10). At the end of the phone call the healthcare provider plans the appointment for the visit and sends an e-mail letter containing all the information for the visit.

The phone call takes place as follows:

1) the health provider asks the patient if he/she agrees to have a web-based visit. If the answer is yes, the health personnel:
2) book the telemedicine visit,
3) collect the patient's (and caregiver's) e-mail addresses to share - with a personal code - the web-conferencing site,
4) ask the patient to provide the latest lab test and/or imaging by e-mail before the visit, if not directly available, together with the GP request,
5) ask the patient to fill in the disease-specific questionnaires useful to detect disease activity that he/she will receive by email,
6) detail the visit procedures: the patient must connect by smartphone – preferably with headphones – or through a PC with video and audio on, he/she is expected to choose a quiet, private place with good lighting.

During the visit the patient will be asked about:

- his/her clinical conditions dated from the latest visit, including any recent infections or adverse drug reactions
- current treatment (it is advisable to keep at hand the drug list or the relative packaging)
- latest lab tests and/or other clinical exams (it is advisable to have the tests sent by e-mail and the prescription received at the latest visit)

7) reassure the patient that if he/she forgets anything of what has just been said, a summary will be sent by email,
8) suggest that elderly or less-technologically-skilled patients should ask a caregiver/relative to help them instal the software and/or join the web-visit,

The first phone call could last 8–10 minutes.

2. Rheumatologic staff/patient e-mail exchange

After the first call, patients are invited by an e-mail containing a personal link to a web-based questionnaire. Once the patient has logged-in, she/he is directed to disease-specific, self-assessed questionnaire.

Online training (videos, modules) can be attached to help patients who require assistance to fill in questionnaires during their pre-visit assessment.

The patients are also invited to reply to the e-mail attaching the anonymised results of latest blood tests and any other exam (x-ray, ultrasound, MRI). Alternatively, lab test and radiologic test can be shared through secure platforms or during the televisit. The availability of radiographic and/or other imaging images is strongly suggested: obtaining DICOM files should be pursued whenever possible. The patient should be reminded to bring the images at the next in-person visit.

The results of questionnaires and lab tests are collected to be available during the web-visit with the treating rheumatologist.

3. Web-visit

The patients should connect at least 5 minutes before the booked time of the televisit, to solve any possible technical issue.

The web-visit should reflect the in-person clinical workflow, and is divided into 4 stages:

a. **Interview**
b. **Lab test**: the results sent by the patient are shared and discussed.
c. **Physical examination**: this is the most challenging phase; general appearance should help the physician understand the patients' general conditions, however, it is possible to get information at least on skin/ cutaneous appendages lesions and joints. Patients can be directly involved in the physical evaluation, by teaching them to self-assess their musculoskeletal system.
d. Treatment: At the end of the visit, similarly to a traditional outpatient visit, the requested laboratory tests, imaging and proposed therapy will be included in a "dear doctor" letter for the general practitioner. The medical prescription should be carried out using dedicated software, as already the case in many national or local institutions. The availability of a single dedicated software should be strongly encouraged.

Discussion

The COVID-19 outbreak is still affecting the rheumatology practice, more than might have been expected, and patients with chronic, potentially disa-

bling disease are at risk twice: they risk being infected but they are also at risk of their disease being neglected. In this scenario, telemedicine can be offered as a part of care for patients with rheumatologic diseases allowing patients to be evaluated even in the impossibility of make in-person visits.

Telerheumatology encompasses a variety of ways to remotely assist patients with rheumatologic diseases. Telephone-based consultations and televisit have a different performance in terms of diagnostic accuracy but also patients' preference (4). Chevallard *et al*. reported an Italian experience with phone-based teleconsultation; overall, 431 patients were evaluated by televisits and almost in a half of cases (193 patients) the telephone evaluation was considered insufficient and required an in-person visit (11). During the first months of the pandemic, telephone-based tight-control strategy allowed to control the achieved target in patients with rheumatoid arthritis (12). Web-based telerheumatology is another way allowing close monitoring of patients with rheumatic diseases. Muskens *et al*. described the experience of a self-management outpatient clinic (SMOC) launched before the pandemic, based on a platform accessible by patients and health-care professionals; permitting to remotely assist patients with rheumatoid arthritis in their self-management, the SMOC determined to spare health-care resources while maintaining disease control (13).

Visualising the patient during a videoconference allows the physician to capture non-verbal cues that add valuable insight, to perform a "physical examination" and, not less importantly, to maintain the communication process on which the relationship between doctor and patient is based (14).

Telemedicine should not be considered only a safe and effective way to support the cure of chronic patients, but also an additional way to deliver care (10). Not only in the case of a health emergency like the one we are experiencing but even in those situations where it is impossible to attend the outpatient clinic (elderly people living alone and far from the hospital, people with limited walking ability). Tornero-Molina *et al*. reported a Spanish experience with rheumatology teleconsultation (overall 469 visits) forced by the COVID-19 emergency, demonstrating that patients had to travel an average of 33 km (about 2 hours of travel) for the in-person visit (14).

Thus, thanks to the experience gained in recent months, in the future we should be ready to offer all the possible cares meeting the needs of patients.

Patients diagnosed with chronic diseases may prefer to be followed-up by the same physician who usually takes care of them. For this reason, telehealth should be ideally provided by the same health care professional involved in the routine outpatient clinic activities, using the same medical records and the usual scheduling system (15). Health-care providers should reassure patients that the web-visit is just another way to deliver care and it does not replace but supports traditional care. Telemedicine visits should be managed as much as possible in the same way of in-person visits (10). Recent experiences demonstrated that patients treated for various chronic conditions achieve similar outcomes if treated by telemedicine rather than in person (16).

The care delivery mechanisms should be personalised according to the patients' needs and capabilities (10). The health care provider should have the possibility to use a personal computer (PC) for video interaction with patients (in alternative, a tablet or, at least, a smartphone). Regarding patients, most people today have got a smartphone and many patients can directly access – or can be helped with accessing – a web-conferencing software on their smartphone or PC. Under the guide of a trained rheumatologist, patients with inflammatory arthritis can also self- assess swollen joints, allowing the remote monitoring of the disease and, together with other clinical data, providing useful information for early diagnosis (17). Teleconsultation also allows involving general practitioners in the management of chronically ill patients and lets the caregivers take part in the visit, even if they live far away. Finally, sporadic reports and, most of all, a recent systematic review demonstrated that simple telemedicine interventions such as text messaging and telephone calls can improve adherence to long-term medication (18, 19).

The experience with tele-rheumatology is growing and rheumatologists' acceptance of telephone-based and video consultation seems to be high (20-23).

Of course, there are still many barriers to telemedicine implementation, mostly related to payment and data security. Reimbursement of a telemedicine visit needs its own administrative code, which is not yet available in several public or private health systems (24).

Data protection is one of the main concerns. The exchange of patients' data via e-mail was used as an emergency tool during the first pandemic wave to allow immediate and feasible contact with the patients during the lockdown. It should be underlined that e-mail is not the best way to share lab and radiologic tests due to a lack of privacy control; to avoid e-mail consultation, alternative systems such as telemedicine platform are recommended.

Another great issue is the challenge of a web-based medical procedure: "It'll never be the same as a physical examination with all of its human qualities of judgement and communication" and "physicians, too, we should keep in mind, benefit from the in-person consultations as much as patients" (16). Moreover, the documentation of disease activity could be less accurate during the televisit due to a different way in recording outcome measures (7). The definition of which Patients Reported Outcome Measures (PROMs) should be used is another important issue. A dedicated task force to identify the best ones to be used for each disease and their feasibility in this context of telemedicine should be desirable. For example, the Rheumatoid Arthritis Disease Activity Index (RADAI) and the Rheumatoid Arthritis impact of Disease (RAID) are two disease-specific questionnaires showing a good discriminatory performance in distinguish patients' disease activity and a good correlation with clinical indices (25, 26). By identifying patients with a well-controlled disease activity, the use

of PROMs could help distinguish patients who may benefit from telehealth from those with a disease flare who need immediate care.

Likewise, telemedicine is not fully indicated for the first visit of new patients; in that case, as well as in patients with disease flare, telehealth would only allow a first diagnostic framework and the stratification of patients needing an in-person visit, according to priority (27).

In conclusion, the pandemic has generated a strong push toward telemedicine and, at the same time, some resistance among unprepared clinicians. It is undoubtful that the in-person visit offers the best quality of care to patients with rheumatologic diseases. On the other side, even if telemedicine is not the ultimate solution, we should consider the alternatives determined by limited hospital access or fear of exposure to COVID-19 patients: delayed visits or no care at all. Thus, in the past months, telemedicine has allowed – and it still does – continuity of care. Once the contingency of the pandemic has been resolved, we should be ready to deliver any type of rheumatological care, in person or remotely, to meet the different needs of patients with chronic rheumatologic diseases.

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