

The Effects of SARS-CoV-2 Pandemic Countermeasures on Patients Receiving Infiltrative Treatment for Musculoskeletal Disorders: a Study from an Italian Cohort

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DOI:

10.32098/mltj.04.2021.09

LEVEL OF EVIDENCE: 4

SUMMARY

Background. COVID-19 outbreak had a massive worldwide impact and several countermeasures to contain its spread have been adopted, such as the interruption of non-urgent outpatient clinics. We wanted to describe the effects of the national lockdown on the well-being of a cohort of Italian patients with musculoskeletal disorders receiving infiltrative treatment.

Methods. 40 patients who received intra- or peri-articular treatment were surveyed using a structuralised questionnaire that assessed their well-being during the first national lockdown.

Results. 24 out of 40 patients (60%) did not come back after the re-opening of the Clinic because they were afraid of the pandemic. Of these 24 patients, the 83.3% noticed increased pain and stiffness in the joint. Due to the lockdown, the patient's quality of life was reduced by $61.66 \pm 15.72\%$. After the lockdown, for the 92% of patients, the infiltrative treatment was perceived as more important than before, the 83% of patients perceived long-term security of infiltrative therapy availability as very important, and the 72% of the patients perceived the lockdown as inadequate.

Conclusions. The infiltrative outpatient clinic's interruption was seen to significantly worsen the physical condition of subjects with musculoskeletal disorders, with an important increase in both articular pain and stiffness. Therefore, any kind of infiltrative treatment suspension or delay should be avoided.

KEY WORDS

Infiltrative treatment; musculoskeletal disorders; SARS-CoV-2; COVID-19; Coronavirus.

INTRODUCTION

The COVID-19 (COroNaVirus Disease-19) pandemic, caused by the SARS-CoV-2 (Severe Acute Respiratory Syndrome CoronaVirus 2), had a massive impact all across the world during 2020, and marked our lives in an indelible way, changing the reality we were used to (1).

Italy has been the first European country to be hit by the pandemic, and it has also been among the most affected in the world after China, with the highest number of reported cases in Europe during the first outbreak of the pandemic (2-4). Consequently, several countermeasures to control the COVID-19's spread were implemented, such as a general lockdown and the suspension of public hospitals' outpa-

tient clinics (2). This interruption put under pressure almost all the healthcare sectors, such as the Physical and Rehabilitation Medicine (PRM) ones, and negatively influenced the access to care of patients affected by musculoskeletal disorders (such as osteoarthritis) who periodically receive intra- or peri-articular infiltrative treatment.

The intra- and peri-articular infiltrative treatment were proven to be safe and effective (5-7), and they are widely used for the treatment of several musculoskeletal disorders, such as arthritides, tendinopathies and fasciopathies, that can cause significant pain and functional limitation in patients, reducing their quality of life (QoL) and impairing their activities of daily living (ADL).

At our infiltrative outpatient Clinic, injections are usually practiced using corticosteroids, corticosteroids and anesthetics, hyaluronic acid, and collagen.

After the first outbreak of the pandemic, at the re-opening of the injection Clinic, infiltrative therapy was carried out following the guidelines launched by the I.S.Mu.L.T. (Italian Society of Muscles, Ligaments and Tendons), that highlighted the importance of selecting patients not affected by COVID-19 (for example recognizing some musculoskeletal symptoms such as fatigue, myalgia and arthralgia that have been related to the novel Coronavirus (8)), to practice injections by implementing all the most appropriate measures to protect health-care workers and patients from contagion, and to guarantee the maximum sterility and safety during the injection procedure (9). Furthermore, several studies showed how corticosteroid injections are safe and could be performed during the pandemic since they are not associated with a higher infection rate compared to the general population (10-13).

Infiltrative therapy has short-term effects on articular pain and stiffness, so it must be cyclically repeated, approximately every 6-12 months (depending on the underlying condition and on the used drug).

For this reason, we hypothesized that the suspension of infiltrative therapy due to the COVID-19 countermeasures could have an important impact on the physical condition of patients with musculoskeletal disorders, causing the reduction of their autonomy in complying with the ADL.

Therefore, the aim of this study is to describe how the countermeasures for COVID-19 influenced the well-being of a cohort of Italian patients with musculoskeletal disorders receiving intra- or peri-articular infiltrative treatment.

Countermeasures against Covid-19

The President of the Italian Republic enacted a decree on the 23 February 2020 to contain the SARS-CoV-2 contagion, stating that “urgent measures on the containment and management of the epidemiological emergency due to COVID-19” were needed (14). Following this national ordinance, the Campania region (with Naples being its capital and biggest city), which was one of the first regions in Italy to adopt all

the measures against the COVID-19 spread, promulgated a regional regulation on the 5 March 2020 that established the immediate interruption of all the non-urgent outpatient activities provided by all hospitals (both public and private) until the 18 March 2020 (15).

The University Hospital Federico II of Naples, where our intra- and peri-articular injection treatment outpatient Clinic is based, and where this study was conducted, followed the regional regulation of the 5 March 2020 and then prolonged the suspension of deferrable outpatient activities until the 3 May 2020 (15).

From the 5 May to 17 June 2020, despite the re-opening of some outpatient Clinics, our intra- and peri-articular infiltrative treatment’s outpatient Clinic was not operative since patients rejected to immediately resume the infiltrative treatment, being afraid of an increased risk of SARS-CoV-2 infection in the hospital setting.

MATERIALS AND METHODS

Design

This study is a survey on the lockdown’s effects due to the SARS-CoV-2 pandemic on patients receiving intra- or peri-articular injections therapy. The survey is based on telephone interviews using a structuralised questionnaire (**table I**) like the one created by Dressler and Adib Saberi to assess the reduction of the quality of life of patients receiving botulinum toxin therapy during the first outbreak of the COVID-19 pandemic (16). Their questionnaire was modified to the aims of our study. The telephone calls were made in May 2021. The study meets the ethical standards of the journal (17). This study was carried out following the guidelines given by the local ethics committee. All information from patients were treated anonymously, and all data were saved on a laptop which access password was given just to the authors involved in the study.

Treatment institution

The study was performed at the Rehabilitation Unit, Department of Public Health, University of Naples Federi-

Table I. Structuralised questionnaire to survey the effects of the anti-coronavirus lockdown on patients receiving infiltrative treatment.

1. Increased articular pain: YES, NO
2. Increased articular stiffness: YES, NO
3. Reduction of quality of life (from 0 to 100%): _____
4. Change of perception of the infiltrative treatment caused by lockdown: MORE IMPORTANT THAN BEFORE, NO CHANGE. IN PERCEPTION, LESS IMPORTANT THAN BEFORE
5. Perception of long-term security of the infiltrative treatment: IMPORTANT, VERY IMPORTANT, LESS IMPORTANT
6. Perception of the anti-coronavirus lockdown: ADEQUATE, NOT ADEQUATE

co II, Naples, Italy. Two Resident Doctors (D.T., R.G.) and two Professors of Medicine (F.S., B.C.) were involved in the study. In 2019, a total of 394 intra- or peri-articular injections were performed, while in 2020, due to the lockdown and the subsequent closure of the infiltrative treatment's outpatient Clinic, only 182 injections were performed.

Patients

Patients were retrospectively collected from the Department's database. A total of 40 patients were recruited for this study. The age range was 42-82 years. The inclusion criteria were the following: 1) patients who came once for treatment from October 2019 to the beginning of the first lockdown (8 March 2020), but then did not come back to the Clinic after its re-opening; 2) patients who cyclically came to the Clinic in 2019, but then did not return in 2020 at all; 3) patients who cyclically came to the Clinic from 2019 to the beginning of the first lockdown (8 March 2020) and then returned in 2020 but after a while since the re-opening of the Clinic.

The first inclusion criteria were established from October 2019 to the beginning of the first lockdown because it was a 6-month interval, so it was reasonable that patients who had their first cycle of treatment during that period, could then come back during the lockdown period.

The participation of patients in this study was entirely voluntary, and none of the invited patients declined their participation.

Intra- or peri-articular treatment

Intra- or peri-articular infiltrative treatments were performed using corticosteroids, corticosteroids and anaesthetics, collagen and hyaluronic acid. The musculoskeletal conditions treated were shoulder arthritis, rotator cuff

tendinopathy, partial rotator cuff tear, epicondylitis, wrist arthritis, sacroiliac joint arthritis, hip arthritis, knee arthritis, Achilles tendinopathy, and plantar fasciitis.

Inter-injection intervals were usually settled between 6 to 12 months, and the choice of the most appropriate drug was tailored on patient's needs.

For the treatment of the arthritides, corticosteroids, corticosteroids plus anaesthetics, and hyaluronic acid were used. For the treatment of tendinopathies and fasciopathies, collagen was used.

Table II and **table III** report the treated anatomical regions, and how many intra- or peri-articular injections (and related used drug) were performed in 2019 and 2020, while in **table IV** patient demographics are reported.

RESULTS

A summary of the results of the present survey is reported in **table V**.

Of the 40 patients selected for the study, the 5% did not answer the telephone. The 20% of patients said that they did not come back after the re-opening of the Clinic since they felt good after the first cycle of treatment. The 15% of patients did not have any benefits after the intra- or peri-articular infiltrative treatment, so they did not want to come back to the Clinic.

24 of 40 patients (60%) did not come back after the re-opening of the Clinic because they were afraid of the COVID-19 pandemic.

For the 83.3% of patients who did not come back to the Clinic, pain and stiffness in the joint increased, for the 8.3% only pain increased (but not stiffness), and for another 8.3% only stiffness increased (but not pain).

Due to the lockdown, the patient's quality of life was reduced by $61.66 \pm 15.72\%$ (range 30%-80%).

Table II. Anatomical regions treated and number of injections performed in 2019.

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- **Shoulder:** 14 corticosteroid and anaesthetic, 20 corticosteroid, 6 hyaluronic acid, 128 collagen
 - **Sacroiliac joint:** 4 corticosteroid and anaesthetic
 - **Hip:** 2 corticosteroid, 50 hyaluronic acid
 - **Knee:** 16 corticosteroid and anaesthetic, 18 corticosteroid, 122 hyaluronic acid
 - **Foot:** 14 collagen (8 for plantar fasciitis, 6 for Achilles tendinopathy)
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Table III. Anatomical regions treated and number of injections performed in 2020.

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- **Shoulder:** 16 corticosteroid and anaesthetic, 22 corticosteroid, 16 hyaluronic acid, 30 collagen
 - **Elbow:** 6 collagen (for epicondylitis)
 - **Wrist:** 12 corticosteroid and anaesthetic (for the trapeziometacarpal joint)
 - **Sacroiliac joint:** 6 corticosteroid and anaesthetic
 - **Hip:** 6 corticosteroid and anaesthetic, 8 hyaluronic acid
 - **Knee:** 4 corticosteroid and anaesthetic, 44 hyaluronic acid
 - **Foot:** 10 collagen (for Achilles tendinopathy)
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Table IV. Patient demographics and administered doses.

Total number of patients [n]	40
Male patients [n]	28
Female patients [n]	12
Patient age in 2021 (mean ± standard deviation) [years]	64.55 ± 11.62
Injections performed in 2019 [n]	394
Injections performed in 2020 [n]	182
Reduction in performed injections between 2019 and 2020 [%]	54

After the lockdown, for the 92% of patients, the infiltrative treatment was perceived as more important than before, while for the 8% there was no change in perception. The 83% of patients perceived long-term security of infiltrative therapy availability as very important, 17% as important and none as less important. 72% of the patients perceived the lockdown as inadequate, while the 28% perceived the lockdown as adequate.

DISCUSSION AND CONCLUSIONS

COVID-19 pandemic caused the interruption of hospitals' outpatient clinics in order to contain its spread,

especially among the most fragile patients. The COVID-19 pandemic had a negative effect on the care of patients with musculoskeletal disorders, since it is well known that all chronic musculoskeletal conditions (especially osteoarthritis) require a regular and accurate follow-up (18). PRM clinical activities were heavily affected, negatively influencing the access to care of subjects who receive intra- or peri-articular infiltrative treatment. Consequently, patients' quality of life during the lockdown period was reduced by 61.66 ± 15.72%. In the 92% of patients, the lockdown confirmed the perception of the importance of infiltrative treatment. The 83% of

Table V. Effects of the infiltrative treatment outpatient Clinic's lockdown on patients according to the administered questionnaire.

Symptoms caused by lockdown	
• Increased joint pain [% of patients]	8.3
• Increased joint stiffness [% of patients]	8.3
• Increased both of them [% of patients]	83.3
Reduction of quality of life caused by lockdown (mean ± standard deviation) [%]	61.66 ± 15.72
Change of perception of intra-articular treatment caused by lockdown	
• Therapy is more important than before [% of patients]	92
• No change [% of patients]	8
• Therapy is less important than before [% of patients]	0
Perception of long-term intra-articular treatment security	
• Very important [% of patients]	83
• Important [% of patients]	17
• Less important [% of patients]	0
Perception of lockdown	
• Inadequate [% of patients]	72
• Adequate [% of patients]	28

patients felt the long-term infiltrative treatment security as very important for their health condition, and the 72% reported that their patient rights were not respected during the lockdown. Therefore, the pandemic and the subsequent interruption of intra- or peri-articular infiltrative therapy for patients with musculoskeletal diseases caused a worsening of their physical conditions, with a marked increase in articular pain and stiffness.

One limitation of our study is the relatively small sample and the lack of a control group, but it should be emphasized that, to our knowledge, this is the first survey that assessed the impact of COVID-19 countermeasures on patients receiving intra- or peri-articular infiltrative treatment.

In conclusion, the results of our study highlighted how the injections outpatient Clinic's interruption in 2020 worsened the physical condition of subjects with musculoskeletal disorders, causing them a considerable increase in their symptomatology. The importance of intra- and peri-articular infiltrative therapy to treat these patients and the need to administer it regularly and without any important interruption is essential to not lose its clinical benefits, so any kind of treatment suspension or delay must be absolutely avoided.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

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