



Negative effect of lockdown on juvenile idiopathic arthritis patients

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Abstract

Introduction The aim of this study is to evaluate a possible negative action of lockdown, during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, in the follow-up of juvenile idiopathic arthritis (JIA) patients.

Methods We compared the number of JIA reactivations in the period March–July 2020 to the same months of 2018 and 2019.

Results A total of 10 JIA reactivations have been documented on 58 patients (17%) visited in the period March–July 2018; 10 reactivations on 61 patients (16%) in the period March–July 2019; and 19 reactivations on 39 patients (49%) in the period March–July 2020, with a statistically significant increase ($p < 0.001$). The other 19 patients who should have been visited during the same period, contacted by phone, indicated remission. Therefore, we hypothesize that the effective number of reactivations in the period March–July 2020 would be 19/58 patients (33%) which remains significantly greater than in the previous 2 years ($p < 0.05$). Among the 19 JIA patients reactivated in 2020, 3 spontaneously stopped the basic treatment due to parents' choice for fear of serious complications in case of SARS-CoV-2 infection and 4 had poor compliance with underlying treatment. In addition, 14/19 reactivated JIA patients did not perform the scheduled check according to the follow-up. In fact, the mean time interval between two follow-up visits was significantly greater in 2020 (157 ± 53 days, $p < 0.0001$) vs 2018 (108 ± 68 days) and 2019 (107 ± 40 days).

Conclusions We have found a significant increase in JIA reactivations in the period March–July 2020 compared to the same interval of 2018 and 2019. This increase may have been caused by poor compliance with background treatment, as documented in 7/19 JIA patients reactivated, and by a greater interval in follow-up checks. Therefore, it is necessary, in occasion of a new pandemic and lockdown, to implement greater controls using more appropriate telemedicine tools.

Key Points

- COVID-19 pandemic lockdown had a negative effect on the follow-up of JIA patients.
- A significant increase in JIA reactivations was found during the lockdown.
- Poor therapeutic compliance and follow-up checks have been proven during the lockdown.
- It is necessary to improve telemedicine tools and scientific information during a pandemic and lockdown.

Keywords COVID-19 pandemic · Juvenile idiopathic arthritis · Lockdown · SARS-CoV-2 · Telemedicine tools

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, caused by a novel beta-coronavirus, was

first described in a group of patients with pneumonia symptoms in Wuhan, Hubei province of China, in December 2019. It is responsible for a severe acute respiratory syndrome which resulted in an increase in mortality, especially in elderly

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patients and with pre-existing chronic diseases [1, 2]. In just a few months, coronavirus disease 2019 (COVID-19) has become a global pandemic. Due to the contagions' exponential growth, in Italy and in many countries of the world, it was necessary to implement confinement measures that provided for social isolation, closure of all the production activities not of primary needs, and interruption of all non-urgent healthcare activities. This has led to a delay in diagnostic tests and treatment which have contributed to increasing the morbidity of many diseases [3, 4]. By implementing the provisions of the Prime Ministerial Decree of 9 March 2020, our hospital has suspended deferred and non-urgent outpatient activities. As of 4 June 2020, based on the regional provisions and the mitigation of health emergency, outpatient activities were reactivated for ordinary services, witnessing an increase in requests for visits for suspected reactivation of juvenile idiopathic arthritis (JIA).

The aim of this study is to evaluate a possible negative action of lockdown in the follow-up of JIA patients.

Patients and methods

We compared the number of JIA reactivations, followed up at our unit, in the period March–July 2020 to the same months of 2018 and 2019. The inclusion criteria were a follow-up > 1 year from the diagnosis and the achievement of a remission state. We considered patients with JIA with or without uveitis, according to known scientific criteria [5]. All patients or parents (in the case of minors) gave informed consent to participation in the study.

Statistical analysis

Statistical analysis was performed by using the “comparison between proportion” test in order to compare the percentage of reactivations (calculated as the ratio between the number of reactivations and the number of visited patients) in the different periods; moreover, the “Student *t*” test was applied in order to compare the means of follow-up time between the examined years (2018, 2019, and 2020). A *P*-value smaller than 0.050 was considered to be statistically significant. Statistical analyses were performed using SPSS 22.0 for Window package.

Results

The demographic and clinical characteristics of the JIA patients visited in the period March–July of the years 2018, 2019, and 2020 are showed in Table 1.

We documented 10 JIA reactivations on 58 patients visited (17%) in the period March–July 2018; 10 reactivations on 61 patients visited (16%) in the period March–July 2019; and 19

Table 1 Demographic and clinical characteristics of the JIA patients visited in the period March–July of the years 2018, 2019, and 2020

| | 2018 | 2019 | 2020 |
|----------------------|---------|---------|---------|
| N° JIA patients | 58 | 61 | 39 |
| F/M | 44/14 | 44/17 | 29/10 |
| Follow-up (years) | 5.5 ± 3 | 5 ± 3.5 | 5.3 ± 4 |
| Systemic JIA | 3 | 3 | 2 |
| Oligoarticular JIA | 35 | 35 | 25 |
| Polyarticular JIA | 8 | 10 | 7 |
| Arthritis-enthesitis | 4 | 4 | / |
| Spondyloarthritis | 4 | 5 | 3 |
| Psoriatic arthritis | 4 | 4 | 2 |

JIA, juvenile idiopathic arthritis; F, female; M, male)

reactivations on 39 patients visited (49%) in the period March–July 2020, with a statistically significant increase in 2020 compared to the previous 2 years ($p < 0.001$) (Table 2). The other 19 patients who should have been visited on an outpatient basis during the same period of 2020 indicated by phone a state of remission. Therefore, we hypothesize that the effective number of reactivations in 2020 would be 19/58 patients (33%) which remains significantly greater than in the previous 2 years ($p < 0.05$). Among the 19 JIA patients reactivated in 2020, 3 had spontaneously stopped the basic treatment due to parents' choice for fear of serious complications in case of SARS-CoV-2 infection; 4 had poor compliance with underlying treatment; 5 had continued therapy with good compliance; 2 had temporarily stopped treatment for flu symptoms; and 5 were previously in remission and without background therapy. No one of them reported SARS-CoV-2 positivity. In addition, 14/19 reactivated JIA patients did not perform the scheduled check according to the follow-up. We therefore calculated the mean time interval between two follow-up visits for each individual patient visited in the period March–July 2018, 2019, and 2020. We have found that this time interval was significantly greater in 2020 (157 ± 53 days $p < 0.0001$) vs 2018 (108 ± 68 days) and 2019 (107 ± 40 days) (Table 2).

Discussion

With the starting SARS-CoV-2 outbreak and infections exponentially growing, Italy and other world's countries have been forced to implement containment measures to limit infections. With the Prime Ministerial Decree of 9 March 2020, all non-urgent or deferrable health activities were suspended at a later date. Where it was possible, telemedicine tools were underway to secure patients follow-up [6]. Nevertheless, we have seen an increase in the morbidity of different pathologies

Table 2 Demographic and clinical characteristics of the JIA reactivated patients in the period March–July of the years 2018, 2019, and 2020

| | 2018 | 2019 | 2020 |
|------------------------------------------------------------------------|-------------|-------------|-----------------------|
| N° of JIA reactivated patients/N° of JIA visited patients (percentual) | 10/58 (17%) | 10/61 (16%) | 19/39 (49%)* |
| Mean time interval between the clinical visits (days) | 108 ± 68 | 107 ± 40 | 157 ± 53 [^] |
| F/M | 8/2 | 6/4 | 13/6 |
| Mean follow-up (years) | 6.2 ± 3 | 4.8 ± 3.2 | 5.2 ± 3.4 |

JIA, juvenile idiopathic arthritis; F, female; M, male

* $p < 0.001$ vs 2018 and 2019

[^] $p < 0.0001$ vs 2018 and 2019

because of the wrong behaviors during the lockdown (sedentary lifestyle, irregular diet) and the delay in treatment or diagnostic tests [4].

We highlight a statistically significant increase in JIA patients reactivations during the period March–July 2020 compared to the same months of 2018 and 2019. We believe that this increase may represent a secondary effect of lockdown. Seven out of the 19 reactivated patients had shown poor compliance with treatment, often for fear of possible complications in case of SARS-CoV-2 infection. Moreover, 14 out of 19 patients did not perform scheduled follow-up control, although it was necessary. JIA patients, followed at our Department, undergo visits with hematological controls on average every 3 months [7]. These checks allow us to assess compliance with therapy and the clinical state of arthritis. This follow-up program was interrupted by the lockdown. In fact, the mean time interval between two follow-up visits was significantly greater in 2020 than in 2018 and 2019.

The JIA activity may be a predisposing risk for infections, and the clinical score represents an independent risk factor [8, 9]. Consequently, stopping treatment spontaneously exposes the risk of reactivating the disease [9], whereas COVID-19 incidence seems to be similar in patients with an autoimmune rheumatic disease (ARD), compared to the general population [10]. The Pediatric European Rheumatology Society (PRES), due to the lower incidence and lower morbidity of COVID-19 among pediatric patients, indicated to continue therapy in children with rheumatic diseases [11–13]. Pediatric rheumatic patients should be considered at increased risk of COVID-19 only if they are receiving corticosteroids > 0.5 mg/kg/day or immunosuppressive treatment [11]. If fever arose during treatment with MTX, they would be allowed to stop it, but if they were being treated with biologics, they should contact the rheumatologist [11].

Regarding the follow-up of rheumatological patients, PRES recommends asking the family doctor or pediatric rheumatologist if it is possible to postpone the appointment or if it can be performed by phone or through some other remote device [11]. Despite our availability, we found a poor response from patients in communicating their health status,

their doubts about the continuation of treatment, and the clinical progress of their disease. Patients' perceived increased risk of contracting SARS-CoV-2 was associated with beliefs about rheumatic disease, medications, comorbidity, and anxiety [14]. In most cases, hospitals were considered by parents as a possible site of infection, maybe the most dangerous, especially for those children already suffering from an underlying chronic disease or treated with the immunosuppressive drug. All of this was also influenced by a confused and occasionally wrong information from social media, accessible to the common population. We therefore believe that failure to visit patients on an outpatient basis may have influenced the increase in JIA reactivations. For this reason, based on our experience, it is necessary to encourage and improve telemedicine tools, if another lockdown will be. There are several telematics devices that healthcare personnel can offer to the patients and their caregivers, like messaging via e-mail or mobile phone, easier and faster to use, or virtual visit through video call, which constitutes a real medical procedure and is followed by the formulation of a clinical report [15]. Consequently, the specialist can modify therapeutic regimens and give useful advice to the management of disease and check the presence of signs and symptoms of underlying disease's aggravation. For parents and kids identifying a flare can be challenging that is because increased pain is less of a hallmark of a flare for kids with arthritis. Parents must therefore care for others' flare signs and symptoms: fever, swollen joints, morning stiffness, decreased activity level, limping, and change in mood.

In any case, all telematics activities must be carried out with prior informed consent and respecting for privacy, also considering family cultural status and compliance. Moreover, the use of telemedicine tools can facilitate several resource-wasting processes in patient care, reducing the risk of SARS-CoV-2 contagion [16]. Remote health interactions have limitations, in particular legal aspects of some prescriptions and medical responsibility [17]. The SARS-CoV-2 pandemic has forced some countries to promote fast administrative and legal support to implement telehealth as an option to prevent attendance to places with a higher risk of contagion [18].

However, an alternative to telematics must also be considered for those who do not have availability. It is always important to consider separate paths in hospitals, distancing the location and staff assigned to the care of patients tested positive for COVID-19 from locations and staff dealing with the care of the chronically ill patients. Furthermore, scientific societies must send frequent and simple messages informing about the best management of these chronic diseases during the pandemic.

In conclusion, based on our study, we believe that the lockdown may have had an important negative impact on the correct management of JIA patients, such as to determine an increase in reactivations, mainly due to poor treatment compliance or inadequate follow-up. Therefore, if there shall be a new lockdown, the patient and family should be instructed on the recommendations issued by scientific societies regarding the management of rheumatic diseases and on possible problems if these are not respected. We believe it is necessary to make use of more appropriate telemedicine tools that allow to meet needs of patients, guaranteeing a more adequate distance follow-up. In fact, lacking of contact between doctor and patients, in a social distancing setting due to reduce COVID-19 contagions, can represent a sanitary problem, compromising the effectiveness of interaction between a healthcare professional and patient and consequently disease's outcome.

Author's contributions G. Conti conceived the study and analyzed data. F. Galletta did the literature search, acquired the data, and wrote the manuscript. N.S. Carucci acquired the data and wrote the manuscript. A. LaMazza and C. Visalli critically revised the paper. S.A. Mollica acquired the data. A. Alibrandi did the statistical analysis. All authors approved the final version of the paper

Data availability Not applicable.

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Disclosures None.

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