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Prospective study of arthralgia in patients with COVID-19 infection in past

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Abstract

Introduction: Arthralgia is one of the symptoms seen in patients with COVID-19. The aim is to study the development of joint pains in patients post COVID-19 infection.

Methods: 34 RTPCR-positive patients for COVID-19 infection were included in the study from flu OPD and COVID ward. At 4 months follow-up, they were evaluated using a questionnaire.

Results: Mean age was 31.65 years, in which 33% were males. Arthralgia was seen in 12 /34. Arthralgia was mild to moderate in 8 /12 participants. 2/ 12 patients with arthralgia for more than three weeks but less than 3 months. 2/12 patients developed arthralgia for more than three months.

3 out of 12 patients developed polyarthralgia.

Conclusion: COVID infection predisposes many patients to develop arthralgia of a severity ranging from mild to severe grade.

Keywords: COVID, arthralgia, myalgia, joint pain

Introduction

COVID-19 infection is caused by (SARS-COV2) virus and has led to pandemics in waves across the world. Has been is battling a pandemic since 2019 and has already experienced two waves of the same. Initially affecting the respiratory tract predominantly, it has now evolved into a multisystem disease with a variety of symptoms such as fever, cough, fatigue, headache, arthralgia, vomiting, myalgia etc ^[1].

Myalgia is well known in many viral infections starting with the respiratory tract, such as influenza viruses, but arthralgia is not so common ^[2]. However, arthralgia is commonly observed in infections by parvovirus B19, hepatitis B virus, HIV, Flavi viruses and alpha viruses ^[3]. Immune complex deposition or transient synovitis in joints can occur in COVID-19 infection and is thought to be the cause of arthralgia in COVID-19 infection also ^[4]. There have been multiple case reports of arthralgia due to reactive arthritis by Parisi *et al.*, Liew *et al.*, Joob and Wiwanit kit *et al.* ^[5, 6, 7]. However, there are very few studies which have studied this topic in this part of the world. Lechien *et al.* from Europe reported arthralgia in 31% of patients ^[8]. There are few studies which have studied myalgia combined with arthralgia from China, Singapore, the USA, Bolivia etc, but no one has studied arthralgia separately from myalgia ^[9]. Also, most of the studies were retrospective studies. Hence, we decided to study the occurrence of arthralgia in otherwise healthy adults prospectively.

Materials and methods

We carried out a prospective study for the development of arthralgia at MIMER Medical College, Talegaon from April 2021 to August 2021 with follow-up on 34 patients. Subjects were included in the study if greater than 18 years of age and found to be RTPCR positive from nasopharyngeal or throat swab for COVID-19. Ethics committee approval was taken from the ethics committee of the MIMER Medical College. Appropriate consents were obtained from patients. We excluded pregnant patients, severely ill patients who were admitted to the ICU unit. Also, we excluded patients with any major illness in the past like diabetes mellitus, hypertension, ischaemic heart disease etc. We included patients from flu OPD for the study only if they tested RTPCR positive for COVID-19.

We excluded patients with a history of pre-existing arthritis like osteoarthritis, rheumatoid arthritis, post influenza arthritis, Gouty arthritis, psoriatic arthropathy before becoming COVID positive. We studied parameters such as grading of joint pain if any (0-4), number of joints paining, duration of pain and demographic variables like age, sex, address. A questionnaire was used to collect data at four months follow-up. All subjects selected were subjected to a series of questions in the vernacular language of the subject by the investigator. The questionnaire was directly uploaded to a Google document.

Instruments/questionnaires used for data collection

- Clinical examination and demographic profile of patients
- A detailed questionnaire evaluating the presence or development of joint pains, which the principal investigator will be asking the patients

Detailed research plan: The study will be spanned over 4 months, wherein the first 3 will be for data collection and in the last month, data will be analysed. The study will include subjects who have had a positive COVID - 19 infection and are now cured of the disease and are coming to the orthopaedic OPD complaining of joint pain. Both large and small joint pains will be evaluated by using a detailed questionnaire. We are taking patients who are now COVID-19 free because there are certain NSAIDs (paracetamol, diclofenac, etc.) And Antimalarial drugs (hydroxychloroquine, etc.) (2) That are given to patients who are tested COVID positive that masks the effects of any kind of arthritis. Hence patients cured of COVID are taken in this study.

Questionnaire

Please fill in the blanks:

Name of investigator _____

Date: ___/___/20___

Name of Patient - Age - Gender - Address - Contact Number - Working as/ profession

Date of positive COVID-19 (RT- PCR or Rapid antigen test) - Presence of any comorbidities - HTN/DM/CHD/ currently existing arthritis/ etc.

Hospitalisation after positive test - Yes/No

If yes, date of hospitalisation -

Clinical symptoms at the time of admission - (free text)

Clinical symptoms at the time of discharge - (free text)

CT findings - CORAD score -

Treatment received during illness -

If hospitalised, date of discharge -

Date of negative RT-PCR or rapid antigen test -

Arthralgia began with: A fever, an accident, other describe

Arthralgia affects: fingers, hands / wrists, elbows, shoulders, neck, back, toes, feet / ankles, knees, hips.

Ability to carry out your daily life this week? 0 will be marked if the patient can always do it and have no difficulty with the task, 2 is marked if the patient can usually do it. However, have some difficulty, 4 if he/she can sometimes do it, but you usually have much difficulty, and 6 if unable to do it.

Dressing and Grooming: Are you able to: Dress yourself, including shoe laces and buttons, Shampoo your hair,

Arising: Are you able to: Stand up from a straight chair, Get in and out of bed

Eating: Are you able to: Cut your meat, Lift a full glass to your mouth, and Open a milk carton

Walking: Are you able to: Walk outdoors on flat ground, Climb 5 steps, Go down five steps, Walk on uneven ground. Will be checking for any aids or Devices that the patient usually uses for any of the above activities: Aids used for dressing (button hook, zipper pull) Special or built up a chair, Built-up or special utensils, Cane, Walker, Crutches, wheelchair

Note down any categories that the patient usually needs help from another person: Dressing and Grooming, Arising, Eating, Walking

Ability to carry out these tasks during the week

0 will be marked if the patient can always do it and have no difficulty with the task, 2 is marked if the patient can usually do it, although have some difficulty, 4 if he/she can sometimes do it, but you usually have much difficulty, and 6 if unable to do it.

Hygiene: Are you able to: Wash and dry your body? Take a tub bath? Get on and off the toilet?

Reach: Are you able to: Reach above your head and get down a 5 LB bag of sugar? Bend down to pick up clothing from the floor

Grip: Are you able to: Open car doors? Open previously opened jars? Turn faucets on and off?

Activities: Are you able to: Run errands and shop? Get in and out of a car? Do chores such as vacuuming and yard work? Dance Golf Swim Please check any Aids or Devices that you usually use for any of the above activities: Raised toilet seat, Bathtub seat, Bath tub bar, long handled appliances in bathroom, long handled appliances for reach. Jar opener (for previously opened jars), please check any categories that you usually need help from another person: Hygiene, Reach, Grip, Activities

How's your Overall Health? In general, would you say that your overall health is: excellent, very good, good, fair, or poor?

Morning stiffness: Are you stiff in the morning? Yes no, if yes, how long does the stiffness last: hours, minutes

Pain None to Severe graded from 0_____100. When a patient wakes up in the morning, is there an ache? Yes/no. If yes, how long does your pain last? Do you take anything for pain? Yes, no. If yes, please list and its dosage

Symptoms: Have you had any of these symptoms today, this past week, this past month?

General - Fever, Dizziness Tiredness (fatigue)

Head, eyes, ears, nose, mouth, throat - Blurred vision, Ringing in your ears, Hearing difficulties, Mouth sores, Dry mouth Loss, change in taste, Headache

Chest, lungs and heart Chest pain Shortness of breath: Wheezing: (today, this week, this month)

Musculoskeletal: Joint pain: Joint swelling: Leg or ankle swelling Low back pain, Muscle pain, Neck pain Weakness of muscles

Gastrointestinal tract: Loss of appetite, Nausea, Heartburn, Indigestion, Pain in the stomach area, Liver problems, Pain in the lower abdomen, Diarrhoea -severe and frequent Constipation, Black or tarry stools, Vomiting

Skin: Easy bruising, Hives or welts, Itching, Rash, Pregnancy

What changes are you making to your daily routine?

Water Patient drank _____ glasses of water before. The patient now drinks _____ glasses of water daily. The water the patient drinks is tap/ bottled (brand or mixed brands), filtered/ distilled

Exercise: walking, yoga, water exercises, gardening, dance, other

Data collection procedure

The data will be collected in 2 steps

- The first step is the questionnaire - All subjects who had a positive COVID - 19 infection will be subjected to a series of questions in the vernacular language of the subject by the principal investigator.
- The questionnaire will be directly uploaded to a Google document, thus reducing the cost of paperwork.

Results

The mean age of the population was 31.65 (+/-10.84).

33% of participants were males.

Joint pain (Arthralgia) was seen in 12 patients out of 34 i.e. 35.3% of participants.

The severity of joint pain was mild to moderate in 8 out of 12 participants and severe joint pain was seen in 4 out of 12 participants. Thus, 66.67% of those with joint pain were mild to moderate joint pain. The majority of patients with joint pain (8 out of 12) had joint pain lasting less than three weeks, while two Out of 12 patients had joint pain for more than three weeks but less than 3 months. 2 out of 12 patients developed joint pain for more than three months (chronic arthralgia).

The knee joint was the most commonly involved joint, (6 out of 12 patients had knee pain).

3 out of 12 patients develop polyarthralgia (25%) while 9 out of 12 patients developed oligo-arthralgia (75%). Oligo-arthralgia was considered if <3 joints were involved.

Discussion

Arthralgia is distinct Musculoskel *et al.* manifestation of COVID-19 infection. Mostly all studies have considered both myalgia and arthralgia as one entity as far as post COVID symptoms are considered [10, 11]. Myalgia after viral infections usually coincides with fever as it is mostly due to cytokine release. The arthralgia can occur due to inflammatory or immune response or direct damage to synovium by virus. Viral arthralgia can occur even after the onset of fever or even later after the fever is subsided due to the above mechanisms [12, 13, 14]. Hence we decided to study arthralgia occurring up to 4 months after the day RTPCR test for COVID-19 infection was observed positive.

In our study mean age of the population was 31.65 years

probably related to participants selection from flu OPD and general COVID ward in which patient had only mild to moderate symptoms and exclusion of patients from COVID ICU where many older adult patients were admitted for their serious conditions. Also, we had excluded patients with pre-existing comorbidities like diabetes mellitus, hypertension. In our study majority of patients had mild to moderate arthralgia only (8 out of 12) and total of 35.3% of patients had joint pains. In a study by Lechien *et al.* arthralgia was seen in 31% of patients. In a study by Zhang *et al.*, 12% of patients had arthralgia [15]. In a study by Lei *et al.* 32.4% of patients had arthralgia [16]. While the percentage of arthralgia was 5.49% and 10.8% in studies by Qian *et al.* and Ma *et al.* respectively [17, 18].

However most of these studies are retrospective studies and comorbidities were not excluded from study, unlike our study. Also in these studies, the pattern of joint pain was not studied unlike in our study, where we studied severity of joint pain, a number of joints involved, duration of joint pain etc except for the study by Raju Vaishya *et al.* [19].

Our findings showed that time less than three joints are involved (75%) and joint pain was mild to moderate in 2/3rd of the patients and that the joint pain usually lasted less than three weeks in 66.67% of the patients. This study, however, shows that a significant percentage of the patients develop joint pain over three weeks and of severe grade and sometimes involve more than three joints. The category of patients are bound to be classified as long COVID infection if the joint pain last more than three weeks. In a couple of patients, joint pain persisted for three weeks, indicating chronicity. However, since our study was questionnaire based study only we cannot comment which patients are likely to develop chronic joint pain without biochemical studies.

Limitations of study

- 1 Small sample size
- 2 Short duration of follow up
- 3 We did not do any blood test or x-rays of the joints and kept our study only restricted to the questionnaire.
- 4 However, since there was no control group and our study was only questionnaire-based, further studies will be required to study arthralgia for more information on this topic in the future?

Conclusion

Arthralgia is not so uncommon symptom in COVID-19 infection and usually last less than three weeks in most patients, though it can last for a longer time in few patients. In some patients it can be severe also. Most of the times it involves less than three joints but in few patients it can involve more than three joints also. COVID infection in the past predisposes patients to develop arthralgia of both small and large joints with a severity ranging from mild to severe arthralgia.

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