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The Effect of Spinal Steroid Injections on COVID-19 Infection and Its Severity

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Abstract

Aim: This paper is to determine the incidence of COVID-19 infection and severe symptoms following spinal steroid injections for pain control.

Methodology: This a retrospective observational study based in the department of neurosurgery, Salford Royal Foundation Trust. Study period is from March 23rd, 2020 till December 31st, 2020. 222 patients had these injections during the time period. Data was collected by telephonic interview and online questionnaire. Data was analyzed to find out how many of the people who received steroid injection got COVID infection and how many had severe infection. It was then compared with local infection rates.

Results: Out of 222 patients found, 130 patients opted to take part in the survey. Six patients among them had tested positive after the injection and two more patients had symptoms of COVID who have been considered to be positive. Overall, 6.15% of patients who received steroid injections had positive COVID-19 results. 3.85% patients had the infection within 3 months of injection. One patient (0.77%) needed hospital admission due to COVID. The incidence of COVID during this time period in Salford was 6.17% and rate of hospital admission due to COVID was 0.77%.

Conclusion: The rate of COVID-19 infection after steroid injection are lower than the local incidence of COVID in Salford during that time period and equivalent to the rate of hospital admission due to COVID. This suggests that a steroid injection in the spine for pain management does not increase the incidence of COVID or cause severe infections.

Keywords: COVID-19 infection; Steroid injections; Spinal steroid injections

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Introduction

It is well known and well-studied over years that systemic corticosteroids have a massive impact in suppression of immunity through various mechanisms as studied by Dr. Anthony Fauci et al. [1]. Corticosteroids can influence the immune system in our body in multiple ways as described in several studies. It affects both the innate and adaptive immune systems, including functioning of neutrophils, macrophages, monocytes and lymphocytes [2-4]. Although injected locally, epidural corticosteroid injections were found to have systemic effects with suppression of Hypothalamic-Pituitary-Adrenal (HPA) axis. Studies have demonstrated the effects of Methylprednisolone injection in the epidural space on the HPA axis [5]. Habib et al. [5] showed that HPA axis suppression continued till 4 weeks with 40 mg methylprednisolone epidural injection in about 20% of patients. In another study with Triamcinolone 80 mg injection ACTH and cortisol suppression was found for 1 to 4 weeks and urinary free cortisol was suppressed for more than 12 weeks [6]. Joint injections with corticosteroids were found to have increased incidence of influenza over 5 years of the study period, compared to incidence in people who did not have steroid injections [7]. With the emergence of COVID-19 there were concerns that steroids may lead to severe infection. Several guidelines were published from various organizations in the UK cautioning clinicians on the use of steroid injections for pain in view of the pandemic [8]. However, while COVID flourishes other diseases have not stopped, and hence this study was done to find out whether spinal steroid injections have caused any patient to have severe COVID infection or not.

Methods

This is an observational retrospective study on a cohort of all patients who had steroid injections for radicular pain. All of them had received 80 mg Triamcinolone injection. A time period ranging

from March 23rd, 2020 to December 31st, 2020 was selected. March 23rd the beginning day of lockdown in the UK. To give enough time for steroid effects to wear out (approximately 3 months) the end date was chosen to be December 31st. A total of 222 patients were found who had corticosteroid injections in epidural space, facet joints or nerve roots for radicular pain. However, 130 patients out of them were willing to take part in the survey. Patients were contacted by telephonic interviews or through an online questionnaire. In both the methods a set of questions were asked to find out whether any of them had COVID-19 infection after the injection, and if so, after what duration of getting the injection. They were also asked about other medical comorbidities, which may as well cause severe COVID infections. Comorbidities that were considered to be confounding are diabetes mellitus, asthma, COPD, chronic organ failure, active cancer, autoimmune disorders and connective tissue disorders. Their regular medications were enquired as well, since steroid tablets, anticancer drugs; immunomodulators are also known to affect immunity.

In case the patients had symptoms of COVID-19 but did not get tested for it, they were still considered to have the infection. The specific symptoms that were considered were loss of taste or smell, persistent new cough, fever and malaise, shortness of breath.

All the patients were either contacted by telephone call, or using AccuRx online system where a link to an online questionnaire was sent to them. By clicking the link, they would be taken to the online questionnaire page and they could send their answers anonymously. The results were compiled and analyzed and compared with local infection rates. None of the patient's personal details were used.

Results

The age group division ranged from about 17% in the age group of 31 to 40 years and about 28% of them in the group of 61 to 70 years. All the other age groups were divided into every decade and the numbers fall in between those percentages. However, if the age group of 16 to 30 was considered, it was <3% which was the smallest age group. Out of 130 patients who opted in for the survey, 6 (4.62%) of them actually had a positive COVID-19 test result, and another 2 patients had symptoms satisfying the inclusion criteria. So, 8 patients (6.15%) were considered to have COVID-19 infection post injection. Amongst the 8 patients who had COVID-19 infection 5 (3.85%) of them had the infection within 3 months of the injection, and all of them had lab tested positive results. Only 1 patient (0.77%) in the study group had severe symptoms and required hospital admission. There were no ICU admissions or deaths. 56 patients were found to have comorbidities which satisfied the inclusion criteria. Of that 56 patients, 2 patients had positive COVID tests. A total of 31 patients were taking medications that are known to cause immunosuppression. Two of them contracted COVID-19 infection. Comparing data from the Government website for COVID-19 information, 6.17% of the total population of Salford were affected during this time, and 0.77% of the population in Salford needed admission to hospital.

Conclusion

Only 5 patients out of 130 patients had COVID-19 infection after having spinal steroid injections. Out of those five persons, two of them had risk factors in the form of comorbidities or medications, suggesting they had a role to play as well for them to have COVID-19 infection. Rate of severe COVID infection after steroid injection was low. So, comparing with local infection rates, the initial results are reassuring that spinal steroid injections do not increase incidence or severity of COVID among the patients. Although this is a small study and caution is still needed when doing spinal steroid injections during the COVID pandemic, this is the first study which shows any data on the incidence of developing COVID and the severity.

Limitations

1. Study population size may not be an actual representation of the local population.

2. The number of people having serious comorbidities or taking immunosuppressive drugs in the study population may not represent the picture of the population, where the possibility is the percentage in the study population is much higher than the general population.

3. The age group division does not represent the actual population.

4. Asymptomatic COVID infection may be possible which could not be included because they were not tested. However, this still satisfies the aim of the study which is to find whether steroid injections caused any problems due to COVID to those patients.

Acknowledgement

Data was used from the Government website for information on COVID-19 - https://coronavirus.data.gov.uk/ - for comparison with study data.

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