



## RESEARCH

# THE EFFECT OF THE COVID-19 PANDEMIC ON LUMBAR EPIDURAL STEROID INJECTIONS IN ELDERLY PATIENTS: ONE YEAR DATA

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## ABSTRACT

**Introduction:** To investigate the effects of the COVID-19 pandemic on epidural steroid injection treatment in elderly patients and to inform our colleagues to take possible precautions concerning treatment strategies.

**Materials and Methods:** Retrospectively, patients who received lumbar epidural steroid injections between January 2019 and March 2021 were included in the study. The procedures performed between January 2019 and January 2020 before the pandemic were classified as Group A, and those performed during the pandemic period between March 2020 and March 2021 were classified as Group B. Demographic data, baseline pain scores, and waiting times for procedures and medical treatments in both groups were compared.

**Results:** There were 186 and 81 patients in groups A and B, respectively. The mean age was 74 in Group B and 73 in Group A. Lumbar spinal stenosis and disc herniation were the most common diagnoses in both groups. The waiting time for epidural steroid injection was 39.4 days (0–160) in group B and 23.4 days (0–149) in group A. There was no significant difference between the two groups in terms of medical treatment for neuropathic pain.

**Conclusions:** COVID-19 has caused a significant decrease and delay in the number of epidural procedures related to lower back pain in elderly patients. In the future, this decrease may create a burden on the health system. However, more observational and prospective studies are needed to inform our colleagues about the possible effects of COVID-19 on the elderly.

**Keywords:** Aged; Lower Back Pain; Pandemics; Injection, Epidural.

## CORRESPONDANCE

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## INTRODUCTION

The coronavirus pandemic, which was named coronavirus disease 2019 (COVID-19) and has become a major problem all over the world, was initially identified in Wuhan City, China in December 2019 (1). As of the beginning of 2020, health systems have begun to suffer strain due to COVID-19, which spread all over the world. Most countries tried to keep the epidemic under control with curfews so that their health systems would not collapse. Most hospitals have been turned into pandemic hospitals, and most elective procedures have been postponed. During this period, it has been understood that COVID-19 infection is age-dependent (2). In elderly individuals, COVID-19 infection is more severe and shows a more mortal course. Therefore, curfews in our country were first applied to elderly patients. In this way, the outbreak of the COVID-19 pandemic has had adverse effects on the health and treatment of elderly patients (3-5).

Epidural steroid injections (ESI) are one of the preferred interventional pain procedures in patients with lower back pain (LBP) who are unresponsive to conservative treatment, and they have been performed with the caudal, interlaminar or transforaminal approaches (6). ESI is an effective treatment option in the short to medium term in selected cases that are clinically and radiologically evaluated (7). As most elective cases were cancelled during the pandemic period (3), ESI treatment may also have affected elderly patients. This may have caused the treatment of elderly patients to be interrupted. For this reason, we wanted to investigate the effect of the COVID-19 pandemic on ESI treatment in elderly patients and inform our colleagues to take possible precautions about treatment strategies.

## MATERIALS AND METHODS

### Design and study population

After approval of the institutional ethics committee (09.2021.1283), a retrospective evaluation of

patients who received fluoroscopy-guided ESI between January 2019 and March 2021 in a tertiary hospital pain management centre was performed. The data on all patients were collected from hospital medical documents (demographic data, baseline NRS, type of procedure and medical treatment). The waiting time (day) for the procedure was determined as the time between the decision to have an epidural injection and the date the procedure was performed. The inclusion criteria selected those aged  $\geq 65$  who had an ESI (lumbar interlaminar, lumbar transforaminal or caudal approaches). Patients without demographic or clinical data were excluded from the study. The patients were divided into two groups according to the date of the procedure. Procedures performed between January 2019 and January 2020 were classified as Group A (the pre-COVID-19 pandemic period), and those performed between March 2020 and March 2021 were classified as Group B (the COVID-19 pandemic period).

### Statistical analysis

Statistical analyses were performed using SPSS version 22.0 software (IBM Corp., Armonk, NY). Continuous variables were expressed in mean (standard deviation) and median (interquartile range), while categorical variables were expressed in number and frequency. The chi-square test was used to compare categorical variables. The Shapiro-Wilk test was used to analyse the normal distribution of quantitative data. For the comparison of non-normally distributed data, the Mann-Whitney U test was performed, while the independent t-test was used to compare normally distributed data. A p-value  $<0.05$  was considered statistically significant.

## RESULTS

The numbers of patients in groups A and B were 186 and 81, respectively ( $p <0.001$ ). The mean age

was 74 in Group B and 73 in Group A, and there was no significant difference between the two groups. In addition, there was no significant difference in BMI between the groups. Although there was a proportional increase in females in group B and the pre-treatment numeric rating scale (NRS) scores in group B were higher than those in group A, no statistically significant difference was found between the two groups. Lumbar spinal stenosis (LSS) and lumbar disc herniation (LDH) were the most common diagnoses in both groups (Table 1).

The waiting time for epidural procedures was 39.4 days (0–160) in Group B and 23.4 days (0–149) in Group A ( $p = 0.003$ ). There was a significant difference between the two groups in terms of waiting times. While the number of patients in group A was 186, it decreased to 81 in group B. There was a significant difference between the two groups. Likewise, the number of transforaminal, interlaminar and caudal epidural steroid injections was decreased in group B compared to group A. There was no significant difference between the two groups in terms of the drugs used by the patients for neuropathic pain

(Table 2).

## DISCUSSION

The COVID-19 pandemic has adversely affected health systems all over the world. In particular, the confinement of elderly patients to their homes has prevented them from accessing health systems. As a result, delays in treatment occur in many health areas. For this reason, all patients over the age of 65 who received lumbar ESI in our clinic 12 months before and during the pandemic were screened. The ESI procedures performed in elderly patients decreased by 56.5% compared to the pre-pandemic period, and the waiting time of the patients for the procedure was extended by an average of 16 days. Despite this, it was determined that there was no change in the use of drugs for neuropathic pain.

The prevalence of LBP in elderly people varies between 21% and 75% (8), and it is more common in postmenopausal women than in men (9). In the present study, it was determined that 63.5% of the patients were females who underwent ESI before COVID-19, and this rate was 70.4% during the COVID-19 pandemic period. Although female dominance continued before and during the pan-

**Table 1.** Demographic data between the two groups

Variable value	Group A	Group B	<i>p</i>
Age (years)	72.97 ± 6.56	74.04 ± 7.19	0.282
BMI (kg/m <sup>2</sup> )	29.66 ± 5.71	29.58 ± 4.65	0.911
Pre NRS	8.35 ± 1.40	8.49 ± 1.26	0.262
Gender (n and %)			
Male	68 (36.5)	24 (29.6)	0.149
Female	118 (63.5)	57 (70.4)	
Diagnosis (n and %)			
LDH	70 (37.6)	31 (38.2)	0.186
LSS	77 (41.4)	26 (32.1)	
Operation	32 (17.2)	17 (21.0)	

Group A: Pre COVID-19, Group B: COVID-19, n: number, BMI: Body mass index, LDH: Lumbar disc herniation, LSS: Lumbar spinal stenosis, NRS: Numeric Rating Scale

**Table 2.** Treatment differences between the two groups

Variable value	Group A	Group B	<i>p</i>
Waiting time for procedure (days)	23.4 (0-149)	39.4 (0-160)	0.003
Epidural injections (n)	186	81	< 0.001
Transforaminal	100	35	
Interlaminar	48	32	
Caudal	38	14	
Neuropathic pain medications (mg)			
Pregabalin	270.6 (14.5)	255.0 (21.2)	0.617
Gabapentin	1626.0 (86.9)	1420.5 (103)	0.135
Duloxetine	48.75 (15.5)	37.5 (15.0)	0.270
Tramadol	177.8 (100-300)	160.0 (50-300)	0.348

Group A: Pre COVID-19, Group B: COVID-19, n: number

demical period, the rate of women who underwent ESI increased. Staying at home during COVID-19 may be a factor in the increasing rate of women due to immobility and reduced sun exposure because of an increase in metabolic bone diseases (osteoporosis, osteopenia) and LBP (10).

Lumbar spinal stenosis and lumbar disc herniation are some of the most common pathologic conditions that cause LBP among the elderly (11). In the present study, the most common reasons for the procedures performed were LSS (41.4%) and LDH (37.6%) before COVID-19, while the most common causes were LDH (38.3%) and LSS (32.1%) during COVID-19. LSS was one of the most common causes in both conditions. Although this result could be predicted, it is thought to be the result of degeneration that occurs with age and immobilization (12).

Epidural steroid injection is an effective treatment method for elderly patients who do not respond to conservative treatment (13). It has been used in pain control since 1952 and has been found to be particularly helpful in people with radicular pain associated with LBP (14). Manchikanti et al. found that there was an 89.2% increase in epidur-

al injection between 2000–2009, while utilisation of epidural injections declined in all categories at an annual rate of 2.5% from 2009 to 2018 (15). In the present study, during the COVID-19 period, the number of epidural injections decreased by 56.5% compared to the previous year. The reason for this dramatic decrease may be that patients do not want to come to hospital visits, outpatient clinics were closed for a period due to the pandemic, and physicians may avoid steroid use during the pandemic period. According to Dalili et al., during the pandemic period, more than 80% of the members of the British Society of Skeletal Radiology stated that there was an 80% reduction in corticosteroid injections in their musculoskeletal procedures (16).

Due to the burden on the health system during the COVID-19 period, many elective procedures have been delayed (4,5,16). Li et al. reported a 44.8% decrease in hospitalizations due to urological diseases during the COVID-19 period. In addition, they identified eight cancer cases that underwent delays in diagnosis or treatment with unfavourable consequences (4). According to Teo et al., there was a significant prolongation in the time to reach the

hospital in stroke cases and a decrease in the number of patients who arrived at the hospital within 4.5 hours (5). In another study, the 12-week delay rate of musculoskeletal steroid injection during the pandemic period increased from 39% to 53% (16). In our study, while the average waiting time for injection was 23 days before the pandemic, this period increased by 69.5% to 39 days during the pandemic. The increase in waiting time, as in other elective cases, was thought to be due to the burden on the health system and shutdown due to COVID-19.

Although the initial NRS scores were found to be higher during the pandemic period, there was no statistical difference between the two groups. This result supports the claim that COVID-19 has a negative effect on lower back pain (17). In this study, moreover, no difference was found between the medical treatment of neuropathic pain before and during COVID-19. Patients mostly used pregabalin, gabapentin, duloxetine and tramadol. It was determined that amitriptyline treatment was not preferred in our clinic because of its antimuscarinic and cardiac side effects in the elderly (18). While an increase in drug use was expected due to a decrease in the number of ESIs performed, no difference was found before and during the pandemic. This result is thought to be due to the difficulty of accessing

hospitals and drugs during the pandemic period.

Despite the decrease in epidural procedures, the lack of change in medical treatment shows that some patients have to live with untreated pain. Common sequelae of untreated chronic pain include decreased mobility, impaired immunity, decreased concentration, anorexia and sleep disturbances. Untreated chronic pain often results in social isolation, dependency on caregivers and deterioration in relationships with friends and family (19).

Our study has several limitations. First, our study was a retrospective study. Second, it focused on a single centre and included a small number of patients. Finally, it did not evaluate the treatment responses. However, the fact that this is the first time examining the effect of the COVID-19 pandemic on the interventional treatment of elderly patients makes the study powerful.

In conclusion, COVID-19 has caused many delays and disruptions in healthcare systems all over the world. This has caused a significant decrease and delay in the number of epidural procedures related to LBP in elderly patients. In the future, this decrease may create a burden on the health system. However, more observational and prospective studies are needed to inform our colleagues about the possible effects of COVID-19 on elderly patients.

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