Lumbar Spinal Stenosis: Methods of Treatment with Emphasis on Epidural Steroid Injections

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Lumbar spinal stenosis: methods of treatment with emphasis on epidural steroid injections

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Abbreviations (in alphabetical order):
CT = computed tomography
ESI = epidural steroid injection
LSS = lumbar spinal stenosis
MRI = magnetic resonance imaging
NSAID = nonsteroidal antiinflamatory drugs
RTG = X-ray radiation
VAS = visual analogue scale

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Abstract

Background and Purpose: *The aim of the study was to compare two techniques of steroid application into epidural space to patients with lumbar spinal stenosis (LSS), a chronic degenerative spine disorder.*

Patients and Methods*: Sixty LSS patients have been distributed into 2 groups: "BLIND" (n=30, interlaminar epidural steroid injection without RTG control) and "RTG" (n=30, transforaminal epidural injection with RTG control). All patients have received 80 mg of triamcinolon (Kenalog) into epidural space on L4/L5 level, together with 0,5% lidocain (patients in RTG group 3 ml and those in BLIND group 10 ml) in 3 week intervals. They were asked to describe the pain using visual analogue scales (VAS) at the beginning of treatment (VAS-0), after the first (VAS-1), the second (VAS-2) and the third epidural injection (VAS-3). The differences between groups were shown using t-test (age) and χ^2-test (gender). Medians of VAS scores were statistically described using non parametrial methods. P<0.05 was considered as a statistically significant.*

Results: *There is no statistical difference among patients regarding to age (P=0.93), gender (P=0.12) and VAS-0 score before the first injection (P=0.27). There is a statistically significant reduction of pain in relation to VAS-0 in both groups (P<0.001). Both groups do not statistically differ when it comes to their effectiveness in regards to VAS scores .*

Conclusions: *We did not find any statistical difference in postinterventional VAS scores among two groups of patients. Choice of technique depends on the experience of the anesthesiologist, as well as on the local technical possibilities (availibility of RTG devices).*

INTRODUCTION

Lumbar spinal stenosis (LSS) is a chronic, degenerative spine disorder and most common reason for pain and disability among people older than 60 years of age *(1).*

LSS can be a result of degenerative changes that result in neural ischemia and neurogenic claudication, a typical syimptom that is described as a pain in the gluteus with irradiation into both legs, usually reaches knees; weekness, parasthesia. The pain is most often felt while walking, standing for longer periods and walking downhill. All these changes significantly decrease the quality of life *(2).*

LSS is a result of degenerative spinal cascade, hence the stenosis has effects on central canal and nerve root canals as well (Fig.1). It is believed that neurogenic claudication is a result of structural narrowing of central

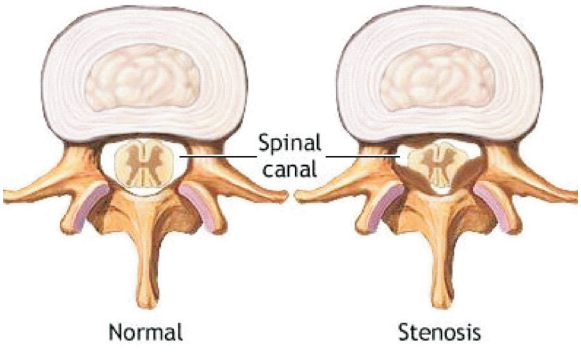

Figure: 1.

spinal canal, which impeds the venous return, thus causing venous hypertension and arterial ischemia of cauda equina *(3).*

The pain is decreased when leaning forward and over a supporting object (pushing a shopping trolley or walking with the aid of walkers). Since more areas are involved, patients suffering from LSS can have unilateral, bilateral, monoradicular or poliradicular symptoms *(4).*

Pathogenesis

LSS pathogenesis depends on multiple factors. There are vascular, biochemical and biomechanical factors that contribute to the signs and symptoms of LSS (3).

Diagnosis

Patients`history of illness states pain in glutei with irradiation into both legs, usually above and at the level of knees, weekness, parasthesia that increases while standing and walking.

The patients are at ease when flexing the spine. Computed tomography (CT) scans and magnetic resonance imaging (MRI) confirm the diagnosis.

Because of the involvement of more areas, patients with LSS can have unilateral, bilateral, monoradicular or poliradicular symptoms *(5).*

Treatment of degenerative lumbar stenosis

Conservative

- Adjusting activities
- Walking aids (walkers)
- Drugs (Paracetamol, nonsteroidal antiinflamatory drugs, low doses of opioids)
- Physical therapy and exercises

Interventional

- Epidural steroid injections
- Surgery

Conservative treatment is used early in the course of illness and among patients with mild to moderate symptoms. Multidisciplinary treatment is necessary and should involve physical therapy, wellness, smoking cessation and weight loss, if needed *(6,7).*

Pharmacological treatment

The first choice are nonsteroidal antiinflamatory drugs (NSAID). Opioid analgetics undoubtedly decrease pain, but are still controversal as a treatment of spinal stenosis *(8).* There is not sufficient evidence that joint use of gabapentin and physical therapy decreases pain and improves walking distance *(9).* Moreover, there is not enough evidence for usage of muscle relaxants, prostaglandin and calcitonin.

Surgical treatments are used after all other options have failed and in patients that experience moderate to severe symptoms *(10, 11).*

When it comes to interventional methods, epidural steroid injections (ESI) are one of the most common used methods in treatment of chronic pain in lowerback and legs *(6, 12, 13).*

There are 3 most often used approaches when injecting steroids.

- interlaminar (blind method)
- caudal
- Ttransforaminal (controlled with RTG)

Transforaminal approach implies the use of RTG in order to reach the nerve root. That is why a smaller amount of drug can be used and that makes it superior to the two therapy approaches. However, the chances for nerve damage with this approach are significantly higher *(6, 14).*

The effectiveness of injecting steroids into epidural space of patients with LSS is wellknown. However, there are not so many papers that compare the difference between both techniques when it comes to pain relief. The aim of this retrospective study is to show the difference between transforaminal and interlaminar epidural steroids injections and theire efect on pain reduction.

PATIENT AND METHODS

Sixty patients with LSS have been distributed into 2 groups: "BLIND"(n=30, interlaminar epidural steroid injection without RTG control) and "RTG" (n=30, transforaminal epidural injection with RTG control).Patients in both groups have received 80 mg of triamcinolon (Kenalog) into epidural space on L4/L5 level, together with 0,5% lidocain (patients in RTG group 3 ml and those in BLIND group10 ml). Patients from both groups received epidural steroid injections in 3 week intervals. They were asked to describe the pain using visual analogue scales (VAS) at the beginning of treatment (VAS-0),

after the first (VAS-1), the second (VAS-2) and the third epidural injection (VAS-3).The differences between groups were shown usingt-test (age) i χ2-test (gender). Medians of VAS scores were statistically described using non parametrial methods. P<0.05 was considered as a statistically significant.

RESULTS

There is no statistical difference among patients when it comes to age (P=0.93), gender (P=0.12) and VAS-0 score before the first injection(P=0.27). There is a statistically significant reduction of pain in relation to VAS-0 in both groups (P<0.001). Both groups, "BLIND" and "RTG", do not statistically differ when it comes to their effectiveness in regards to VAS scores (Table 1).

TABLE 1

VAS scores after the epidural steroides injections (Mann-Whitney U test).

VAS median, (1. i 3. kvartila)	Group BLIND (N=30)	Group RTG N=30	P
VAS-0	8 (7, 9)	7.5 (7, 9)	.266
VAS-1	6 (5, 6)	5 (4, 6)	.072
VAS-2	5 (4, 6)	4 (4, 5.25)	.098
VAS-3	4 (3, 5)	4 (3, 4)	.085

CONCLUSION

We did not find any statistical difference in postinterventional VAS scores among patients with LSS who received interlaminal (»BLIND») and transforaminal ("RTG") epidural steroid injections. Even though this research was conducted with a small number of participants, we conclude that the choice of technique depends on the experience of the anesthesiologist, as well as on the local technical possibilities (availibility of RTG devices).

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