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A study on the role of epidural steroids in various spine problems

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Abstract---Background and Aim: The majority of chronic pain patients suffer from pain emanating from the spine and adjacent structures. Spasticity has the potential to negatively influence quality of life (QOL) through restricting activities of daily living. Hence the aim of present study were to study the efficacy of epidural steroid injection in pain control and to study the role of epidural steroid in reduction of spasticity in post traumatic spasticity in spinal cord injury patients. Materials & Methods: A total of 230 patients attending our hospital for a period of three years were evaluated and followed up. Of the total included patients, 200 patients were having either back pain, sciatica, neck pain with or without radiculopathy and 30 patients were having post traumatic spinal cord injury with spasticity. All the patients were assessed for spasticity according to modified Ashworth scale. All the patients were given epidural steroid at regular interval of 21 days at paraplegia clinic. Results: The data showed that 66.5% of the patients had >50% relief after 3 doses and 54.5% patients were relieved by more than 50% at the 3rd month and 37.5% of the patients were relieved by more than 50% at the 6th month. It shows epidural had good short term relief, fair midterm relief and was not so effective for long term relief. Conclusion: Epidural steroids are very effective means of conservative management for the patients with back, neck and radicular pain. Patients benefitting the most with epidural steroids were those not requiring surgery after thorough clinical and radiological evaluation. In patients with post traumatic spasticity epidural steroid injections were able to reduce spasticity by

more than 40% in most of the patients. Thus they were very helpful in improving the quality of life in patients with spinal cord injury.

Keywords---spinal pain, low back pain, epidural steroids, spinal spasticity.

Introduction

Chronic pain is an important problem in daily medical practice. Apart from its psychosocial consequences for the individual patient, it has enormous socio-economic impact on society. The majority of chronic pain patients suffer from pain emanating from the spine and adjacent structures. It is this type of pain that is a frequent cause for disability and loss of mobility.¹ About 70-80% of the total adult population experiences acute low back or neck pain at some stage of their lives. The symptoms resolve spontaneously in the majority of cases but in 8-12% of patients the pain becomes chronic.² The mechanism of spinal pain is complex. In 15% of patients with low back pain a specific cause is found such as disc protrusion, infection, spondylolysis or a vertebral fracture.³

Pain of the spinal origin can be classified according to primary, secondary, referred and psychogenic causes⁴:

1. Primary pain is considered to be pain which originates from the vertebral column itself or from adjacent structures;
2. Secondary pain is considered to be a consequence of primary pain, possibly mediated by muscle spasm;
3. Referred pain may be defined as pain perceived in a region of the body topographically distinct from the region in which the actual pain source is located;
4. The term psychogenic pain is no longer accepted. This nomenclature suggests a strict dichotomy in pain classification in terms of 'somatic' versus 'psychogenic'. It is now generally accepted that pain should be described as a multidimensional phenomenon.

Primary pain, according to the source can be further classified into⁵:

- a. Pain which originates from the mobile segment and its associated structures (zygoapophysial joints, discs);
- b. Pain which emanates from the more superficial tissues which surround the vertebral column such as ligaments and muscle;
- c. Pain which is caused by involvement of the segmental nerves associated with the vertebral column.

Management of pain of spinal origin is directed to the cause of the pain provided that diagnostic procedures have revealed a specific lesion that correlates with the patient's complaints. However, as mentioned, this approach only applies to a small number of patients. Patients without a specific cause of pain are managed symptomatically by non-invasive conservative treatment such as medication, manual therapy and physical therapy.⁶ Spinal cord injury (SCI) is an insult to the

spinal cord resulting in a change, either temporary or permanent, in its normal motor, sensory, or autonomic function⁶. Spinal Cord Injury (SCI) is a low incidence, high cost disability requiring tremendous changes in an individual lifestyle. The effect of SCI have an impact not only on the lives of the client and family but also on society as a whole.^{7, 8}

Symptoms of spasticity are often experienced by individuals with spinal cord injury (SCI) following a period of spinal shock and, in many cases; these symptoms negatively affect quality of life. Despite its prevalence, spasticity as a syndrome in the SCI population is not always managed effectively.⁹ Spasticity has the potential to negatively influence quality of life (QOL) through restricting activities of daily living (ADL), inhibiting effective walking and self-care, causing pain and fatigue, disturbing sleep, compromising safety, contributing to the development of contractures, pressure sores, infections, negative self-image, complicating the role of the caretaker, and impeding rehabilitation efforts.¹⁰ Keeping the above points in mind the aims and objectives of the present study were to study the efficacy of epidural steroid injection in pain control and to study the role of epidural steroid in reduction of spasticity in post traumatic spasticity in spinal cord injury patients.

Materials and Method

The present study is the randomized prospective study done at our institute. A total of 230 patients attending our hospital for a period of three years were evaluated and followed up. Of the total included patients, 200 patients were having either back pain, sciatica, neck pain with or without radiculopathy and 30 patients were having post traumatic spinal cord injury with spasticity. A detailed history and complete neurological examination was done. Patient with neck or back pain with or without radicular pain were included in the study. Patients with only sensory impairment and with minimal motor involvement were also included. Patients with diabetes mellitus, bleeding diathesis and with any local or systemic infection were not considered.

Detailed history of patient was taken regarding occupation, mode of onset of pain, site of pain, its character, radicular pain, duration, aggravating and relieving factors, any neurological claudication. History of trauma, fever, lifting heavy weights, jerk was taken. Patients were asked for voluntary control, activities of daily living. Thorough general examination of patient was done. Notes were taken especially of obesity. A complete neurological examination was done at each visit before and after epidural injection. Patients were evaluated radiologically with x-rays, C.T.scans, and M.R.I if needed. For the study on spasticity, a convenient sample of 30 paraplegic patients was taken from Paraplegia Hospital, Civil Hospital. All the subjects were admitted and operated in Civil Hospital and then referred to Paraplegia Hospital for rehabilitation.

Inclusion criterias for study

1. Back pain and neck pain
2. Radicular pain
3. Non operated patients for pain

4. Non traumatic disc
5. Traumatic Spinal Cord Injury
6. Duration since injury not more than 2 months
7. Sex : Both males and females

Exclusion criteria for study

1. Non traumatic cause of spinal cord injury
2. Any other associated major neurological, musculoskeletal or cardiopulmonary condition
3. Subject mentally unstable in the judgment of the investigator
4. Subjects whose Modified Ashworth Scale is 4/4 at hip or knee at any time during the study.
5. Patients with Diabetes mellitus, bleeding diathesis
6. Patients with history of allergic reaction.

All the patients fulfilling the inclusion criteria were given injectable Triamcinolone (80mg) and a local anaesthetic with normal saline volume made up to 10 ml, injected in epidural space at our pain clinic. Patients were given 3 doses of epidural steroid at an interval of 21 days. Patients were injected by anaesthetists at pain clinic. Patients were asked to change into a hospital gown, which allows for access to clean the injection area and to allow the anaesthetist to easily visualize the injection site.

The patient lies flat on an x-ray table or with a small pillow under their stomach to slightly curve the back.

- The skin in the low back /neck area is cleaned and then numbed with a local anaesthetic
- With or without using fluoroscopy (live x-ray for guidance), a needle is inserted into the skin and directed toward the epidural space.
- Once the needle is in the proper position, contrast is injected to confirm the needle location. The epidural steroid solution is then injected slowly.
- Following the injection, the patient is monitored for 15 to 20 minutes before being discharged home.

In addition, patients are usually asked to rest for the remainder of the day on which they have the epidural steroid injection. Normal activities were typically resumed the following day. Patients were regularly followed up on outpatient basis before and after each dose and were assessed for pain relief at neck or back, relief in radicular pain, increase in Claudication distance, neurological recovery and spasticity. Pain was assessed according to visual analogue pain scale score.

Visual analogue scale

Pain score > 5 was considered distress. Relief of pain > 50% was considered significant. Patients were also evaluated for relief of pain according to their subjective feelings. Patients' with spinal cord injury were assessed for spasticity as per Modified Ashworth scale (MAS)

0	No increase in tone
1	Slight increase in muscle tone, manifested by a catch and release or minimal resistance at the end of the ROM when the affected part(s) is moved in flexion or extension
1	Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM
2	More marked increase in muscle tone through most of the ROM, but affected part(s) easily moved
3	Considerable increase in muscle tone, passive movement difficult
4	Affected part(s) rigid in flexion or extension

Results

In the present study a total of 200 patients with back, neck and radicular pain were studied at the institute for a period of three years. Following observations were made with patients under study for effect of epidural steroid on disc prolapse and degenerative spine disease. All the patients were given 3 doses of epidural steroid at an interval of 21 days each at pain clinic at our institute. These patients were followed up for 6 months unless few of them were operated.

Following observations were made with patients under study for effect of epidural steroid on post traumatic spasticity. All the patients were assessed for spasticity according to modified Ashworth scale. All the patients were given epidural steroid at regular interval of 21 days at paraplegia clinic and were assessed for spasticity after every dose.

The results showed that age wise distribution of back and neck pain due to disc prolapse and degenerative spine. Out of 200, 64 & 63 patients were in 31-40 & 41-50 age groups. Back pain in younger age was more due to disc prolapsed. In older age group pain was more due to degenerative spine. Traumatic spinal cord injuries were more common in younger population. 36.66% of patients belong to age group 31-40 age group. And about 30% belonged to 21-30 year age group. Only 13.33% of patients were of age more than 50 years. This probably is due to proneness of younger population to accidents. Among the 200 patients; 112 were male and 84 were females. There was no significance of sex found in the incidence of neck and back pain. Comparatively higher number of males could be attributed to random selection and better follow up in males of the society.

Table 1: Pathology (Total no. of patients 200)

PATHOLOGY	NO. OF PATIENTS	%
CERVICAL PID	17	8.5
LUMBAR PID	95	47.5
CERVICAL CANAL STENOSIS	09	4.5
LUMBAR CANAL STENOSIS	66	33
MRI NOT DONE	13	6.5

The table 1 showed that the pathology for which epidural steroid was used was lumbar PID which included 47.5% of the study group followed by lumbar canal stenosis that is 33% and least common was cervical canal stenosis which was

4.5%. The road traffic accidents were the most common mode of injury being so in more than 50% of patients followed by fall from height in 30% of patients. It was found that occupation has role in contribution to backache and neck pain as most patients in my study were moderate and heavy workers. 36.5% were moderate workers and 36.5% were heavy workers while 27% were light workers. Patients working in armed forces, manual labourers, farmers were considered to be as heavy workers. Housewives, teachers were taken to be moderate workers. Patients retired from their jobs, clerks and shopkeepers were considered light workers.

Table 2: Complains (Total no. of patients 200)

COMPLAIN	NO. OF PATIENTS	%
NECK PAIN	25	12.5
LOW BACK PAIN	174	87
RADICULAR PAIN	196	98
CLAUDICATION	66	33
NEUROLOGICAL INVOLVEMENT	24	12

The recorded data showed that the most common presenting complaint of the patients was radicular pain followed by low back pain. Radicular pain was complained by 98% of patients. Claudication was seen in 33% of patients.

Table 3: Independent Opinion (Total no. of patients 200)

OPINION	NO. OF PATIENTS	%
EPIDURAL STEROIDS	117	58.5
SURGERY	83	41.5

Out of 200 patients given epidural steroid in our study, 117 patients in the opinion of the orthopedician, required epidural steroid and 83 patients required surgery. The results shows that outcome of 117 patients who according to surgeon opinion required epidural steroid. 92 patients were relieved with epidural and only 25 patients required surgery. Out of the 83 patients who were advised surgery, only 13.26% patients were relieved finally with epidural steroid while 86.74% finally required surgery for their pain. The data showed that 66.5% of the patients had >50% relief after 3 doses and 54.5% patients were relieved by more than 50% at the 3rd month and 37.5% of the patients were relieved by more than 50% at the 6th month. It shows epidural had good short term relief, fair midterm relief and was not so effective for long term relief.

Table 4: Effect of epidural in patients advised epidural

PATIENTS RELIEVED WITH EPIDURAL AT	NO. OF PATIENTS	%
AFTER 3 DOSES	110	94%
AT 3 MONTHS	103	87.2%
AT 6 MONTHS	68	58.11%

Above table 4 showed the effect of epidural steroid in patients who were considered best to be treated conservatively in view of surgeon at our department. 94% of patients had more than 50% relief after 3 doses. 87% of patients had more than 50% relief even at 3 month. After 6 months only 58% patients had more than 50% relief in their pain.

Table 5: patients advised surgery undergoing surgery (Total no. of patients 83)

SURGERY AFTER	NO.OF PATIENTS	%
WITH IN 1 MONTH	4	0.05
1 – 2 MONTH	10	12.04
2-3 MONTH	25	30.12
AFTER 3 MONTH	33	39.75

The table 5 showed that out of the 83 patients advised surgery 72 had to undergo surgery while 11 had been relieved by epidural steroid. Out of these 72 patients 39.75% underwent surgery after 3 months, 30.12% underwent surgery at 2 to 3 months, 12.04 % underwent surgery at 1 to 2 months while only 0.05 % underwent surgery within 1 month. It shows epidural was even not definitive way of management in 36% of patients but it was definitely helpful in delaying surgery for up to 3 months in about 40% of patients. The table 6 showed the effect of epidural steroid post traumatic spasticity. 50% of patients had improvement in the range of 41 - 50%. 10% of patients had more than 50% of relief in spasticity. All the patients had more than 10% improvement. More than 90% of patients had relief of more than 30%.

Table 6: Effect of Epidural on Spasticity (Total No. Of Patients 30)

IMPROVEMENT IN SPASTICITY	NO. OF PATIENTS	%
<10%	0	—
11-20%	1	3.33
21-30%	1	3.33
31-40%	10	33.33
41-50%	15	50
>50%	3	10

Discussion

Epidural injections for managing chronic pain are one of the most commonly performed interventions in the India. Spinal pain is the most common of all chronic pain disorders. The lifetime prevalence of spinal pain has been reported as 54% to 80%. Annual prevalence of chronic low back pain ranges from 15% to 45%.¹¹ Studies of the prevalence of low back pain and neck pain and impact on general health showed 25% of patients reporting Grade II to Grade IV low back pain (high pain intensity with disability), whereas it was 14% in patients with neck pain.¹²

The underlying mechanism of action of epidurally administered steroid and local anesthetic injections is still not well understood. It is believed that the achieved neural blockade alters or interrupts nociceptive input, reflex mechanisms of the afferent fibers, self-sustaining activity of the neurons, and the pattern of central neuronal activities.¹³ Further, it is believed that local anesthetics interrupt the pain-spasm cycle and reverberating nociceptor transmission. On the other hand, corticosteroids reduce inflammation by inhibiting either the synthesis or release of a number of pro-inflammatory mediators and by causing a reversible local anesthetic effect. Disc prolapse is more common in young & middle age group & degenerative spine stenosis is more common in older age group. The radicular pain is most common symptom followed by localized back and neck pain. Occupation has significant role in patients presenting with pain. Most of the patients were either moderate or heavy workers.

Epidural steroids are very effective means of conservative management for the patients with back, neck and radicular pain. Patients benefitting the most with epidural steroids were those not requiring surgery after thorough clinical and radiological evaluation. 90% of patients were relieved of their pain by more than 50% for 3 months. Even at 6 months 60% of patients were relieved of their pain by more than 50%. The results were comparable to those of study done by Wilson–MacDonald.¹⁴

Even in those patients in whom thorough clinical and neurological evaluation indicated surgery to be treatment of choice, patients receiving epidural steroids were able to delay their surgery by up to 8 months. Most of the patients could delay their surgery by more than 3 months. Thus epidurals can be helpful in patients to buy time for surgery. In patients with post traumatic spasticity epidural steroid injections were able to reduce spasticity by more than 40% in most of the patients. Thus they were very helpful in improving the quality of life in patients with spinal cord injury. Epidural steroid injections can be used as modality of treatment in most of the patients presenting with back pain, neck pain and radicular pain. They can avoid and delay surgery in most of the patients.

Conclusion

Epidural steroids are very effective means of conservative management for the patients with back, neck and radicular pain. Patients benefitting the most with epidural steroids were those not requiring surgery after thorough clinical and radiological evaluation. In patients with post traumatic spasticity epidural steroid injections were able to reduce spasticity by more than 40% in most of the patients. Thus they were very helpful in improving the quality of life in patients with spinal cord injury. Epidural steroid injections can be used as modality of treatment in most of the patients presenting with back pain, neck pain and radicular pain. They can avoid and delay surgery in most of the patients.

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