

EVALUATION OF COMPLICATIONS WITH BLIND INTERLAMINAR EPIDURAL STEROID INJECTIONS

Fiyyaz Akhter Qureshi¹, Muhammad Irfan Butt¹, Rafiur Rehman¹, Qadir Ullah¹, Muhammad Arif²

¹Department of Anaesthesia and Pain Management, Hayatabad Medical Complex, Peshawar - Pakistan

²Department of Orthopaedics and Spine Surgery, Hayatabad Medical Complex, Peshawar - Pakistan

ABSTRACT

Objective: To assess the complications rate of blind interlaminar epidural steroid injections.

Material and Methods: A prospective, non randomized observational study was carried out at Interventional pain clinic Anesthesia department, Hayatabad Medical Complex, Peshawar from July 2009 to November 2012 and included 386 Procedures (Lumbar 361, Cervical 20 and caudal 05). All the interventions were performed as an outpatient procedure by one of the two pain physicians. Measurable outcomes employed were flushing, headache, intravascular entry of the needle, local bleeding, bruising, Dural puncture, nerve root irritation, infection, post procedure soreness and increased pain. The complications encountered during and after the procedure were prospectively evaluated.

Results: Syncope (3.1%), flushing (2.3%), Headache (1.8%), intravascular entry (0.8%), Dural puncture (0.78%), post dural puncture headache (0.5%) and cardiac arrest (0.3%) were observed. The patient was immediately resuscitated and discharged without any morbidity.

Conclusion: Blind interlaminar epidural steroid injections are safe when performed with proper technique, Monitoring and under recommended sterile precautions. The minor complications are common with this procedure but major complications are rare.

Keywords: Epidural, steroid, injections, Backache, Complications, steroid.

INTRODUCTION

Epidural steroid injections (ESI) are commonly offered modality of treatment to relieve spinal pain and improve mobility without surgery¹. The aim of this treatment is to deposit steroids and local anesthetics into the epidural space around the spinal structures. Interlaminar injection by definition is an approach to the dorsal epidural space going through the space between the lamina of the vertebrae. Epidural procedures include interlaminar injections in cervical, thoracic, lumbar and caudal regions². The lumbar interlaminar epidural steroid injections are performed more frequently as compared to cervical and thoracic regions due to the substantial risks.

The rationale for administration of ESI is assumed to be the reduction of inflammation of the spinal nerve causing radicular pain thus relieving the pain and allowing time for healing and physical therapy³. Several non controlled studies have evaluated their effectiveness with varied outcomes.

Address for Correspondence:

Dr. Fiyyaz Akhter Qureshi

Associate Professor

Department of Anaesthesia

Hayatabad Medical Complex, Peshawar - Pakistan

Cell: 0345-9082819

Email: fizq62@yahoo.com

The complications associated with blind interlaminar epidural injections are few and usually minor⁴. A variety of side effects and technical complications are associated with this procedure. These include local discomfort, vasovagal reactions (syncope), intravascular entry, dural puncture, post dural puncture headache, epidural hematoma, facial flushing, transient nerve damage, nerve injury, infection, abscess and cardio respiratory arrest.

Review of the literature did not show any published local study investigating the incidence of complications from blind interlaminar epidural steroid injections. This study is the first to evaluate the incidence of complications arising from this procedure. The complications are either related to the procedure itself or the administration of the corticosteroids or local anesthetics⁵. This prospective study was done to evaluate the incidence and rate of complications from epidural steroid injections procedure.

MATERIAL AND METHODS

This prospective observational study was conducted at interventional pain clinic of anesthesia department at Hayatabad Medical Complex, Peshawar from July 2009 to November 2012 after the institutional review board approval and without any external

funding. All the patients receiving epidural procedure during this time period were included. Most of the patients were referred from orthopedic and spine unit. Patients with uncontrolled diabetes, hypertension and history of coagulopathies were excluded from the study. All the patients were informed about the procedure and nature of study.

Epidural procedures were performed in cervical and lumbar region by blind interlaminar approach. Caudal approach was utilized only in sacral region. These techniques were performed by one of two physicians in sterile operating room located in spine surgery center. Before the procedure intravascular accesses was gained by passing 18 G i/v cannula in all the patients, and were monitored for non invasive

Table 1: Patients demographics based on epidural procedures

Sex	Male	50.5%(195)
	Female	49.6% (191)
Age	Mean ± STD	44.7 ± 1.332

blood pressure (NIBP) and peripheral oxygen saturation (Spo₂) by Nihan koden patient monitor. The epidural procedure was performed in the cervical region between C6- C7 and C7- T1 level with 2.09% and 3.1% respectively. For lumbar region 20.7% of procedures were performed between L5 and S1, 63.21% between L4 and L5, 10.9% between L3 and L4. For lumbo sacral region 1.3% caudal procedures were performed. All the patients received 80 mg (2ml) of Methyl prednisolone acetate (Depo Medral) mixed with 6ml of 1% preservative free lignocaine. Post procedure all the patients were kept in recovery room for 04 hours under monitoring for observation by a trained nurse. Measurable outcomes observed were flushing, headache, intravascular entry of the needle, local bleeding, bruising, Dural puncture, nerve root irritation, infection, post procedure soreness and increased pain.

Two anesthesia technicians were trained to evaluate the above outcomes. Each recipient was instructed to visit the pain clinic within 48 hours after the injection and a follow-up visit after two weeks post injection. If there were any complications they were

Table 2: Illustrates the frequency of complications from blind epidural steroid injections.

Complications	Interlaminar		Caudal	Total
	Cervical	Lumbar		
	20 (5.2%)	361(93.5%)	05(1.3%)	386
IMMEDIATE				
Vasovagal reaction	05%(01)	3.32% (12)	00%	3.36% (13)
Intravascular entry	00%	0.83%	00%	0.77%(03)
Flushing	10%(02)	2.21%(08)	00%	2.59%(10)
Headache	10%(02)	1.10%(04)	00%	1.55%(06)
Local hematoma	00%	00%	00%	00%
Transient nerve irritation	00%	0.27%(01)	00%	0.26%(01)
Dural puncture	00%	0.83%(03)	00%	0.78%(03)
Cardiac arrest	00%	0.27%(01)	00%	0.26%(01)
DELAYED				
PDPH	00%	0.55%	00%	0.51%(02)
Bruises	00%	0.83% (03)	00%	0.78% (03)
Spinal cord infarct	00%	00%	00%	0.00%
Nerve damage	00%	00%	00%	0.00%
Soreness & Pain	00%	00%	00%	00%
Infection	00%	00%	00%	00%

noted and managed by one of the physician. Data was recorded in Microsoft excel by computer assistant of the department. The SPSS 17 statistical version was used to generate the frequency tables. Fourteen patients were dropped from the study as they did not turn up for follow up.

RESULTS

The total number of epidural procedure were 386, with 361 lumbar interlaminar epidurals (93.5%), 20 cervical interlaminar epidurals (5.2%), and 05 caudal epidurals (1.3%). The study period lasted from July 2009 to November 2012. Table 1 illustrates the baseline characteristics.

Table 2 illustrate the frequency of various complications observed during this study. Syncope (vasovagal reaction) was observed in a total of 3.36% of procedures with 05% in cervical region and 3.32% in lumbar region. Facial flushing was observed in 5.18% of the procedures with 10% in cervical and 2.21% in lumbar region. Intravascular entry was observed in 0.83%, only in lumbar procedures. Headache was observed 10% in cervical and 1.10% in lumbar region. Dural puncture was observed in a total of 0.78% of procedures and was only associated with lumbar procedures. No complications were observed during caudal epidural procedures.

One patient (0.26%) went into cardiac arrest soon after injection, was immediately resuscitated on the table and later on discharged without any morbidity. Others were only minor complications and no major complication with catastrophe was observed.

DISCUSSION

Interventional pain management has evolved tremendously since the first documented nerve block performed by Tuffer in 1985⁶. The initial report of blind lumbar interlaminar epidural steroid injection was published for the treatment of lumbar radicular pain syndrome in 1952⁷. followed by the description of blind interlaminar cervical epidural injection in 1972⁸.

The significant recent increase in the utilization of interventional pain, diagnostic and therapeutic blocks, also increase the potential for complications. However the overall incidence of significant complications is low with epidural steroid injections but catastrophic complications do also occurs. This prospective study examined the pattern of adverse events in a group of patients undergoing blind interlaminar epidural steroid injections at various level of spine.

The most common complication was syncope (vasovagal reaction) which occurred in 13 patients (3.36%). Four patients had the reaction when epidural needle was introduced. Nine patients had the reaction after the placement of the drugs into the

epidural space. Abbasi et al has reported the incidence of vasovagal episodes of 0-4% in his study⁹. These reactions are caused by apprehension and fear regarding the epidural procedure and symptoms may include sweating, tachycardia, arterial hypotension and fainting which is improved by placing the patient in head down position and administration of oxygen by face mask.

Intravascular entry was observed in 03 (0.77%) of the patients and it occurs mainly due to the incorrect placement of the needle. Intravascular entry incidence reported by Botwin et al was reported to be 3.1% in his study¹⁰. Intravascular entry can be avoided by adhering to the midline while performing the epidural procedure.

Facial flushing was observed in 10(2.59%) of patients in our study as compared to 9.2% reported by Abbasi et al⁹. Facial flushing required no treatment and resolved in few days. The mechanism of facial flushing with epidural steroids is thought to be from the release of histamine and IGE¹¹.

The incidence of dural puncture and post dural puncture headache was observed in 03(0.78%) and 02(0.51%) of the patients in our study. The documented dural puncture incidence ranges from 0.5% to 5% in literature¹¹. Dural puncture can occur with interlaminar epidural approach when the needle passes beyond the epidural space and enters the spinal canal.

Dural puncture can lead to post dural puncture headache which were observed in 02(0.51%) of patients post operatively in lumbar epidural steroid injections only. The headache in these patients resolved with conservative management in 2 to 3 days, without the need for epidural blood patch. The reported incidence of post dural puncture headache in literature is 7.5 & to 75%, depending on size of the needle, experience and the technique used¹².

Bruising was observed in 03(0.83%) of cases in our study which resolved spontaneously in few days without requiring any specific treatment. Bruising has been reported to be 0.2% in literature and occurred more commonly in caudal epidural procedures².

In our study no complications of local hematoma, nerve damage, infection, abscess or spinal cord infarct have not been observed due to observation of proper sterilization, technique and sterile environment low incidence of such complications have been reported in literature².

One patient went into cardiac arrest soon after injecting the drugs into epidural space. As the patient was being monitored (ECG, Spo2, and NIBP) properly during the procedure the Cardiac Arrest was detected immediately and patient was resuscitated in no time with Cardiac compressions and rescue breathing and later on discharged without any

morbidity. Most probably the cause could be vasovagal reaction associated with hypotension and severe bradycardia resulting in unconsciousness and cardiac arrest¹³.

No complications were observed due to drugs used in epidural steroid injections in our study. The incidence of complications reported in literature are rare with these drugs⁴, but physicians should be aware of the side effects of local anesthetics and steroid and should be ready for its management.

The present study is limited in that it is a single center study. A multicenter study with large number of blind interlaminar epidural steroid injection procedures will determine the safety of blind interlaminar epidural steroid injections.

CONCLUSION

Blind interlaminar epidural steroid injections when performed with proper technique, Monitoring and with recommended sterile precautions are safe with less complications.

REFERENCES

1. Snarr J, Risks, benefits and complications of epidural steroid injections: A case report: AANA journal: 2007; 75; 183-88.
2. Manchikanti L, Mala Y, Warge BW, Kimberly. A cash, Vidys sagar pampati, Bert fellows. A prospective Evaluation of complications of 10,000 fluoroscopically directed epidural injections. J. Pain physician: 2012; 15: 131-40.
3. Nasreen liaq, Mohammad Naeem, Malik javed iqbal, shahid khan. Comparison of epidural steroid injections with conservative management in patients with lumbar Radiculopathy. JCPSP: 2009; 19(9): 539-43.
4. Cicala. R S, westbrook. L, Angel JJ. Side effects and complications of epidural steroid injections. J pain symptoms manage. 1989; 4: 64-66.
5. Bradley S. Goodman, Lyle. W.F posecion, Srinivas Mallampati and Matt Bayazitoglu. Complications and pitfalls of lumbar interlaminar and transforaminal epidural injection. Curr Rev Musculoskeletal Med. 2008; 1, (3-4): 212-22.
6. Manchikanti L, Boswell M. Raj-P, Raez GB. The evaluation of interventional pain Management. J Pain Phycsian. 2003;6: 485-94.
7. Robechi A, Capra R L idracortisone (compost of). Rime esperinzo cliniche in campo reumatologico Minera Med: 1952; 98: 1259-63.
8. Winnie AP, Hartman JT, Meyers HL, Ranamurthy S, Barangan V. Pain clinic II. Intradural and extradural corticosteroids for sciatica. Anesth Analg: 1972; 51: 990-1003.
9. Abbasi A, Malhotra G, Malanga G, Elovic EP, Khan S. Complications of intralaminar cervical epidural injectoin: A review of the literature: spine (Phila Pa 1976) 2007; 32: 2144-51.
10. Botwin KP, Gruber RD, Bouchlas CG, Torres – Romeos FM, Freeman TL, Staten WK. Complications of Flouriscopically guided transforaminal lumbar epidural injections. Arch Phys Med Rehabil: 2000; 81: 1045-50.
11. Sharon, Stern H. Understanding potential complications of epidural steroid injections: Practical Pain Management: 2011; 11: 1-3.
12. Begduk N, christophidis N, Cherry D. Epidural use of steroids in the management of back pain. National health and Medical research council: Canberra, Commonwealth of Australia: 1994: 1-76.
13. Boys JE, Norman PF, Accidental subdural analgesia. A case report, possible clinical implications and relevance to "massive extradural": Br. J. Anesth 1975; 47: 1111-13.

The Journal of Medical Sciences, Peshawar is indexed with WHO IMEMR (World Health Organisation Index Medicus for Eastern Mediterranean Region) and can be accessed at the following URL.

<http://www.who.int/EMRJorList/details.aspx?docn=4468>