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ORIGINAL ARTICLE

Different Doses of Lumbar Epidermal Methylprednisolone Injection and their effect on Pain Control and Blood Glucose Level in Diabetic patients

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ABSTRACT

Background: Frequency of diabetes mellitus is high between people suffering from lumbar spinal degenerative sickness Despite the fact that injection of steroid in epidural space are recognised to rise the glycaemic Blood amount postoperatively, therefore it is inquiry that decrease dose of methylprednisolone (40mg) cannot rise blood glycaemic level as compare to higher dose of methylprednisolone (80mg) and their effect on pain management of patients.
Aim: To evaluate 2 common doses (80mg & 40mg) of methylprednisolone effects which is given through Epidural lumbar route, on glycaemic Blood level and pain management of diabetes mellitus patients to determine an adequate epidural steroid dose.
Methods: This was an observational prospective study was conduct at Department of Anaesthesia Hayatabad Medical Complex Peshawar in June 2022. Overall 110 Diabetes mellitus patients were participated. They acquired lumbar epidural, methylprednisolone for spinal stenosis radiculopathy or failed back surgery syndrome. Methylprednisolone dose were given to patients, either 80mg (Group A) or 40 mg (Group B) was determined clinically after the procedure type.
Results: HbA1c level was noted in group A 6.21mmol/L while in group B 6.52 mmol/L (p =0.991). The increase in fasting blood glucose (FBG) were greater significantly A Group than in B Group on post procedure day (PPD)1,2&3 (PPD1: 179 mg/dL A Group Vs 146mg/dL in B Group), (PPD2: 221 mg/dL in A Group Vs 152mg/dL in B Group) & (PPD3: 202mg/dL in A Group Vs 175mg/dL in B Group). Fasting blood glucose incidence was >180mg/dL were greater in A Group than in B Group on post procedure day 1&2 (PPD1: A Group=11 vs B Group=5) and (PPD2: A Group=13 Vs B Group= 4).
Conclusion: Methylprednisolone increase dose 80mg rise FBG and PDG greater than a decrease dose 40mg with no effect on pain management, employment status, or clinical outcome. Thus, it is recommended that methylprednisolone 40mg will b given rather than 80mg in diabetes mellitus patients with respect to pain management and blood glycaemic level
Keywords: Epidural methylprednisolone, back pain, blood glucose.

INTRODUCTION

The Prevalence of spinal lumbar sickness rise continuously[1]. In older age patients the frequency of diabetes mellitus increased[2]. increased frequency of patients diagnosed with diabetes mellitus have been proposed between the patients proclaimed of spinal stenosis that were higher than anticipated in comparison to an age related general population[3]. Non operative treatment options for patients with spinal back pain and neck pain is Epidural steroid injection. Hyperglycaemia is a given known effect of steroid administration[4]. The most commonly used corticosteroids for epidural injections are methylprednisolone acetate, triamcinolone acetone, and dexamethasone acetate[5,6]. Data from various study show that the fosfolipase activity of the herniation disc is more that of a normal disc (20 to 10.000 times) and the benefits of the epidural steroid injections are due to the anti-inflammatory mechanism, which is secondary to inhibition of fosfolipase A2 resulting with the blockage of synthesis of prostaglandins and leukotrienes[7].

Data from Several studies have Proven that patients with diabetic mellitus, when they received corticosteroids injections intra-articularly their blood glucose level disturbed greater[8,9,10]. The diffusion of injected steroids from joint into blood circulation causes the increase in their blood glucose level. The solubility of preparation related to the amount of steroids in blood compartment and duration of local and systemic effects likely the degree of inflammation of joint and injected dose[11,12].

The aim of our study is to evaluate two different dose of methylprednisolone 80mg and 40mg and their effect on blood glycaemic level in patients with diabetes mellitus by epidural route, and to calculate pain that are subjective in nature on numerical scales as well their clinical results to measure the efficiency of two doses to conform, whether decreased dose 40mg is effective as increase dose 80mg in diabetic mellitus patients.

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MATERIAL AND METHODS

Prospective observations study was conducted in Anaesthesia and Pain Management Department Hayatabad Medical Complex Peshawar from April 2022 to June 2022. Total 110 patients who underwent epidural steroid injections in the pain management centre were assessed for eligibility. Patients were equally divided into two group i.e. A&B (55 in each group). Group A consists of patients who administered epidural methylprednisolone dose of 80mg while Group B consist patients who underwent epidural methylprednisolone injection dose of 40mg. The inclusion criteria of participating patients were its included an age >20 year. Patients having shot of epidural steroid injections of at least 4 month back with symptoms of radiculopathy due lumbar stenosis. Known patients of type 1 and type 2 mouth and taking treatment of diabetes mellitus. diabetes mellitus with HBA1C done within 2. We excluded patients with stroke, respiratory or cardiac disorder, active infection history of anaphylaxis reaction to local steroid. Pregnancy, uncontrolled diabetes mellitus with anaesthetics drugs or complication and undergoing anticoagulation therapy symptomatic spinal stenosis and resonance radiculopathy were confirmed by magnetic images and standard examination. For evaluation the effects of steroid injection and clinical outcome on pain were determined at 2 weeks and blood glucose for 3 by telephone interview. By using SPSS 23.0 analysis of data was done4 day outpatient or statistically significant considered when P value of ≤0.05.

RESULTS

Overall 110 patients were participating in our study. Range of age between 20 and 70 years with a mean age of 45 years. There was 71(64.5%) male and 39(35.5%) females, with male to female ratio of 1.8:1. Patients were equally divided into two group i.e. A&B (55 in each group). A Group consists patients who administered epidural methylprednisolone dose of 80mg while B Group consists

patients who underwent epidural methylprednisolone injection dose of 40mg. HbA1c level was noted in A group 6.21mmol/L while in B group 6.52mmol/L (p =0.991).The increase in fasting blood glucose (FBG) were greater significantly in A Group than in B Group on post procedure day (PPD)1,2&3 (PPD1: 179mg/dL A Group Vs 146mg/dL in B Group), (PPD2: 221mg/dL in A Group Vs 152 mg/dL in B Group) & (PPD3: 202 mg/dL in A Group Vs 175 mg/dL in B Group). The occurrence of blood Fasting glucose >180 mg/dL were greater significantly in A Group than in B Group on post procedure day 1&2 (PPD1: A Group=11 vs B Group=5) and (PPD2: A Group=13 Vs B Group=4) (Table-1).

Increases in postprandial blood glucose (PBG) was greater significantly in A Group than in B Group on post procedure day (PPD) 0,1,2&3 (PPD 0: 271mg/dL in A Group Vs 216 mg/dL in B Group), (PPD1: 259mg/dL in A Group Vs 201mg/dL in B Group), (PPD2: 250mg/dL in A Group Vs 227 mg/dL in B Group) and (PPD3: 212mg/dL in A Group Vs 205 mg/dL in B Group). Beside , the occurrence of postprandial glycaemic Blood level > 250 mg/dL was also significantly more in A Group than in B Group on PPD 1&2 (PPD1: A Group=14 Vs B Group=6) and (PPD2: A Group = 10 Vs B Group=5) (Table-2).

Improvement in pain relief and employment status was noted in both groups. Total 28 patients of A group and 31 patients of B group were pain free and were employed at 8 weeks after the enrolment (Table-3).

Total 34(61.8%) patients in A Group & 41(74.5%) in B Group was discharged at the day of the enrolment of injection, 18(32.7%) patients in A Group & 13(23.6%) in B Group called for follow up with medication, 3(5.5%) in A group and 1(1.8%) in B group needs further epidural steroid injection (Table-4).

Table-1: Fasting blood glucose on post-procedure day

Increase	Group A	Group B	P value
Fasting blood glucose on post procedure day			
Day 1	179 mg/dL	146 mg/dL	0.005
Day 2	221 mg/dL	152 mg/dL	0.002
Day 3	202 mg/dL	175 mg/dL	0.004
Fasting blood glucose >180 mg/dL on PPD			
Day 1	n=11	n=5	0.004
Day 2	n=13	n=4	0.001

Table-2: Increase in Postprandial blood glucose on post procedure day

Increase	Group A	Group B	P value
Postprandial blood glucose on post procedure day			
Day 0	271 mg/dL	216 mg/dL	0.001
Day 1	259 mg/dL	201 mg/dL	0.003
Day 2	250 mg/dL	227 mg/dL	0.005
Day 3	212 mg/dL	205 mg/dL	0.007
Postprandial blood glucose >250 mg/dL on PPD			
Day 1	n=14	n=6	0.001
Day 2	n=10	n=5	0.001

Table-3: Pain relief & employment status between groups

Status	Group A		Group B	
	Frequency	%age	Frequency	%age
Employed due to pain free	31	56.4%	35	63.6%
Un employed due to pain	24	43.6%	22	36.4%

Table-4: Clinical outcome after eight weeks

Outcome	Group A		Group B	
	Frequency	%age	Frequency	%age
Discharge	34	61.8%	41	74.5%
Followup with medication	18	32.7%	13	23.6%
Further epidural inj	3	5.5%	1	1.8%

DISCUSSION

In this study comparison of action of two different methylprednisolone dose which is given through lumbar epidural route on glycaemic blood levels and management of pain of patient from diabetic mellitus[13]. Results of our study show that increase in blood glycaemic level was more in both Post dinner glucose and fasting blood glucose between groups. A increase dose of methylprednisolone 80mg produces a more rise in the blood glucose level than a decrease dose of methylprednisolone 40mg[14]. After two weeks the patients who received lumbar epidural methylprednisolone of dose 80mg or 40mg their pain score did not different. In our study Clinical fate and employment status in two groups did not differ between them. After our study this is recommended that 80mg of methylprednisolone has no advantage over 40mg of methylprednisolone in DM patients, as they more elevate blood glycaemic levels. Rise post dinner blood glycaemic as clinically relevant, with 84% of patients exhibiting an increase in blood glycaemic greater than 180mg/dL. The higher upper glycaemic fasting level is 180mg/dL is known to be control in non-critical patients of diabetic mellitus[15].

Rull M et al reported in his study those diabetes mellitus patients who have spinal stenosis had a increase prevalence in Group of all age .16 In many systems Diabetes mellitus is known cause of disease, including joints and intervertebral discs , resulting in premature degeneration. Initially management of Multiple degenerative lumbar spine diseases are on medication and non-surgically[17]. In some initial treatment options are the injection of steroid in epidural through transforaminal and interlaminar route. In sprite of known efficacy of lumbar epidural methylprednisolone steroid injection for the treatment of lumbar degenerative disease, the adverse effects following LESI for this treatment manner must be considered[18]. Data from Earlier studies shown that those patients receive intraarticular steroid treatment for osteoarthritis have higher Glycaemic index. A study by Novak S et al show that methylprednisolone injection for trigger finger led to increase blood glycaemic level and found 73% rise in blood glycaemic level in all patients over pre-existing levels.19 Habib GS et al reported that the 12 patients who received transforaminal or caudal epidural injections have rise blood glycaemic level significant for 3 days after the procedure.20 Furthermore, data from Manchikanti L et al study shown that the patients received interlaminar epidural steroid injection their average 79% blood glycaemic level rise. .However, data from previous studies did not assess fasting and post dinner blood glycaemic separately[21]. The results of study found that the increase in glycaemic blood amount. Although the rise can be continuous for 3 days only in many patients, even little increases in glycaemic blood rang can be related with side effects. In addition, because ESIs can be done repeatedly in spinal stenosis radiculopathy or syndrome of lower back failed surgery patients. Hyperglycaemia occurs in these patients repeatedly. Since therefore still no treatment for hyperglycaemia occur after epidural steroid injections, currently it is the best way to minimize or prevent the rise in glycaemic blood amount after LESIs. The study shows that methylprednisolone 40mg lower glycaemic blood level after ESI of the patients suffering from diabetes mellitus. The results of our study shows the all patients whose received LESI methyl prednisolone dose of either 80mg or 40mg show no different in their pain control and clinical outcome. Therefore diabetes mellitus will given dose of 40mg methylprednisolone instead of 80mg.

Limitations: In our study cohort of well-controlled patients suffering from diabetes mellitus who has HbA1c level<7. Type of Procedures depends on patient condition by medical decisions and no longer randomized. Route of management was difference and identification of syndrome of lower back surgery can bring about distinct degree of systemic absorption, there by impact the level and length of hyperglycemia. The patients of failed lower back surgery, the epidural space may be destructed by means of surgical operation and in epidural space adhering changes would be considerable.

CONCLUSION

The injection of methylprednisolone given through Epidural route related with numerically sizable increases in PDG in Diabetes mellitus patients continuously to 3-4 days post operatively. The increased methylprednisolone dose rise FBG and PDG more than a decrease methylprednisolone dose without effect on management of pain, clinical outcome or employment status. Consequently in order to blood glycaemic and management of pain, methylprednisolone 40mg preferable instead of 80mg in diabetes mellitus.

Ethical approval: Ethical permission was granted by the Institutional Ethical Review Board.

Conflict of interest: Nil

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