



The effect of triamcinolone on blood glucose levels in suprascapular nerve block in patients with periarthritis shoulder

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Abstract

Background and aim: The present study evaluated the effect of triamcinolone on blood glucose levels in suprascapular nerve block in patients with periarthritis shoulder. Methods: The study was conducted in the Department of Anesthesia and Department of Orthopedics Dr. RPGMC Kangra at Tanda over a period of one year. Patients of both genders above 18 years with pain or stiffness in one or both shoulders suggestive of periarthritis shoulder with gross limitation of the active and passive range of movements for more than four weeks were included in the study. The patients were excluded from the study when 1) patients did not give consent to participate in the study, and uncontrolled diabetic patients with RBS >200mg/dl and HbA1c>6. Results: A total of 35 patients were included. Majority (37.14%) aged between 51-60 years, mean age of the patients was 56.97 years. 51% were males. Right PA was the most common among 10 patients. We found that there was no significant difference in mean blood glucose levels in and triamcinolone group at baseline, 2 hours, Day-3, and Day-7. Conclusion: Blood sugar levels did not rise significantly when triamcinolone was used for suprascapular nerve block in patients with periarthritis shoulder.

Keywords: triamcinolone, suprascapular nerve block; SSNB, blood glucose

Introduction

Background

The frozen shoulder is a multifactorial disease characterized by inflammatory adhesion and stiffness of the glenohumeral capsule, pain in the shoulder, and limitation of movements in all directions (especially abduction, external rotation, and posterior extension). The age of onset falls between 30 and 70 years, with an average age of fifty.¹ Females are more affected than males, with the right shoulder more often involved than the left [1]. The prevalence of frozen shoulder is about 2%–5% [2, 3].

A typical manifestation of frozen shoulder is a limitation of active and passive shoulder movements in all directions in spite of the use of analgesics, which demonstrates that such movement limitation is mainly caused by pathological alterations of the shoulder joint and pain is only a minor pathogenic factor.⁴ The natural course of frozen shoulder consists of three stages: pain, stiffness, and recovery.² It was believed that frozen shoulder is a self-limited disease, in which shoulder pain and function would fully recover after the typical three stages in most cases [4].

Although the etiology of this disease remains unknown, several risk factors are associated with this condition. These include previous trauma, increasing age, female gender, dyslipidemia, hypertension, thyroid dysfunction and diabetes mellitus (DM) [5]. The mechanism by which diabetes influences the development of frozen shoulder has not been identified. Female gender, insulin dependence, uncontrolled blood glucose levels, and a positive family history were associated with significantly higher prevalence of frozen shoulder [6].

The suprascapular nerve (SSN) provides nerve supply to muscles of the shoulder girdle, and to the shoulder joint. Local anesthetic blocks of the suprascapular nerve are used to treat painful shoulder conditions such as adhesive capsulitis.

Triamcinolone is a synthetic glucocorticoid with a potent glucocorticoid but a minimal or no mineralocorticoid activity. It prevents inflammation by suppressing migration of polymorphonuclear leukocytes and fibroblast and reversing capillary permeability.

The present study evaluated the effect of triamcinolone on blood glucose levels in suprascapular nerve block in patients with periarthritis shoulder.

Methods

The study was conducted in the Department of Anesthesia and Department of Orthopedics Dr. RPGMC Kangra at Tanda over a period of one year. Patients of both genders above 18 years with pain or stiffness in one or both shoulders suggestive of periarthritis shoulder with gross limitation of the active and passive range of movements for more than four weeks were included in the study. The patients were excluded from the study when 1) patients did not give consent to participate in the study, and uncontrolled diabetic patients with RBS >200mg/dl and HbA1c>6.

All patients presenting in the outpatient department of Orthopedics at Dr. RPGMC Kangra at Tanda with periarthritis shoulder and fulfilling the inclusion criteria were selected for the purpose of this study for 1 year after approval from institutional

protocol review committee and institutional ethics committee. After obtaining informed consent, the patients were subjected to complete clinical examination of shoulder joint for periarthritis shoulder. An FBG measurement was done one day before SSNB. Next day, the patients were asked to come after 8 hours of fasting and blood sugar was measured before the actual procedure and 2 hours after the procedure.

The patients were evaluated for SSNB and assigned to two groups using computer-generated random number charts. Under ultrasound guidance using a 22G needle, the nerve was targeted in the supraspinous fossa, drug combination including either dexamethasone or triamcinolone were deposited and the block was given. The anesthesiologists monitoring the blood sugar was blind to the type of steroid used in nerve block.

Statistical Analysis

Data were presented as frequency, percentage, and mean±sd wherever applicable. Paired t-test was used to compare normative variable within a group at different time intervals. Chi-square test was used to calculate the difference between categorical variables. A p-value less than 0.05 was considered significant. Statistical analysis was performed using Epi info.

Results

Baseline characteristics

A total of 35 patients were included. Majority (37.14%) aged between 51-60 years, mean age of the patients was 56.97 years. 51% were males. Right PA was the most common among 10 patients (Table 1).

Table 1: Baseline characteristics

	Frequency	Percentage
Age (years)		
31-40	1	2.86
41-50	8	22.86
51-60	13	37.14
61-70	12	34.29
71-80	1	2.86
Sex		
Male	18	51.43
Female	17	48.57
Presenting complaints		
Right PA	10	77.14
Left PA	8	22.86

Blood glucose levels

We found that there was no significant difference in mean blood glucose levels in and triamcinolone group at baseline, 2 hours, Day-3, and Day-7 (Table 2).

Table 2: Change in blood glucose levels with time in Triamcinolone group

	Triamcinolone (n=35)	p Value [#]
Baseline	101.63±12.46	
2 Hours	101.71±13.25	0.967
3 Days	101.97±10.23	0.875
7 Days	101.91±12.33	0.916

[#]Compared with baseline

Discussion

Our study analysis showed that there was no preference for adhesive capsulitis. Our study results are in concordance with the previous studies where it was found that the disease rarely affects bilateral shoulder and it can affect any shoulder side [7, 8]. However, one study suggested that it can occur sequentially bilaterally in up to 40–50% of patients [9].

In this study, there was no change in blood glucose levels with time. Habib and Miari (2011) evaluated the effect of intra-articular TH and TA on blood glucose levels in patients with controlled diabetes with symptomatic OAK. All the patients who received triamcinolone preparations had significantly increased blood glucose levels with median initial levels of 227.5 and 201 mg% seen at a median of 8.5 and 13 hr following the IA injection and median peak levels of 288 and 239.5 mg% seen after a median of 24.5 and 32.5 hr following the IA injection of TA and TH, respectively. Levels returned to normal after 2.5 to 4 days. There was no significant increase in the TH group except in one measurement only with marginal level in 2 patients. They concluded that intra-articular injection of either TH or TA was associated with significantly increased blood glucose levels in patients with controlled diabetes with OAK. This increase was quite solely due to the injected steroids [10].

Kim and colleagues compared the effects of 2 common doses of triamcinolone administered via epidural steroid injections on blood glucose levels and pain control in patients with diabetes mellitus to determine an adequate epidural steroid dose. There were significant increases in FBG level on PPD 1 to PPD 3 in patients who received 40 mg and increase in blood sugar level on a postprocedure day 1 in 20 mg group [11].

We did not observe a significant increase in the FBG post procedure, 2 hr after, 3 days after and 7 days after the procedure. This is due to local deposition of the steroid at the site and less systemic absorption from the area due to poor vascularity in that area. Because of lack of control group without CS in SSNB, we cannot conclude whether the non-significant change in blood glucose was secondary to dexamethasone/triamcinolone or the stress response to the procedure.

Conclusion

This study concluded that blood sugar levels did not rise significantly when triamcinolone was used for suprascapular nerve block in patients with periarthritis shoulder.

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Conflict of interest: None

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