

ORIGINAL ARTICLE

Comparative Analysis of Preoperative Anxiolytics and Blood Sugar Level in Non-Diabetic Patients Receiving Spinal Anaesthesia

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ABSTRACT

Management of blood sugar levels in perioperative period is critical. Effect of surgical stress and anaesthesia have unique effect on blood sugar level, which is taken in consideration to maintain blood sugar level.

It is challenging aspect of preoperative patient's care. Anxiety changes the physiological response to anaesthesia and surgery. There is overall effect on the perioperative anaesthesia outcome.

Various methods are available for reducing patient anxiety before surgery. Among them are educating the patient about their surgery, preoperative counselling, music therapy in form of nature sounds, relaxation exercises, and use of anxiolytic drugs.

The present study was undertaken to evaluate the efficacy of anxiolytic agent when given preoperatively in patients undergoing operative procedures under spinal anaesthesia and compared to those without anxiolytic or placebo preoperatively.

KEYWORDS

• Anxiolytics • Blood sugar levels • APAIS Score • VAS score • Spinal anaesthesia

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INTRODUCTION

Worry, fear palpitation at any instance is characteristic of human being. Anxiety for new environmental conditions goes hand in hand. Any disease state, visit to doctor hospital admission and that to operation under anaesthesia increases the anxiety of any patients. It is challenging aspect of preoperative patient's care. Anxiety changes the physiological response to anaesthesia and surgery. There is overall effect on the perioperative anaesthesia outcome. Anxiety directly affects preoperative sedation, larger doses of induction agents, intraoperative tachycardia, hypertension, increase in oxygen and fluid and delayed recovery. Overall there might be 60 to 80% incidence of anxiety in patients posted for operative procedures. Hence, it becomes mandatory to work on the measures to reduce perioperative anxiety and its ill effects.^{2,3}

Various methods are being practiced to reduce patient's perioperative anxiety before surgical procedure. Education and giving knowledge about the actual surgical procedure, preoperative counseling, entertainment therapy during operative procedure, relaxation exercises and lastly medical therapy as anxiolytic drugs.^{9,6} Benzodiazepines are most popular preoperative medication with high patient acceptance without much drug interaction and adverse effects. Anxiolytic effects of antipsychotics, antihistaminic and barbiturates is questionable but some opioids and especially α_2 receptor antagonists may be helpful in this respect.

Assean *et al.*⁶ developed an anxiolytic index for oral benzodiazepines using ratio of total primary and secondary anxiolytic activity scores divided by the total muscle relaxant and sedative activity score. With use of this index, one can select appropriate anxiolytic benzodiazepines. Alprazolam is one of the anxiolytic drug more efficient than Midazolam.⁹ Human body undergoes several physiological, neuroendocrine and metabolic alterations due to stress and strain of surgery and anaesthesia. It alters the insulin and blood glucose biochemistry.¹⁰ It increases blood sugar due to stress and strain of anaesthesia and surgery. In addition to tissue injury, inflammation preoperative anxiety can also contribute to stress response. Various anaesthesia techniques can modify the

neuroendocrine or hyperglycemic response. Regional anaesthesia is said to have less hyperglycemic response as compared to inhalational techniques.

The present study was undertaken to evaluate the efficacy of anxiolytic agent when given preoperatively in patients undergoing operative procedures under spinal anaesthesia and compared to those without anxiolytic. No placebo in my study preoperatively.

METHOD OF STUDY

260 patients fulfilling Inclusion or exclusion criteria posted for operative procedures under spinal anaesthesia were selected. Only non-diabetic patients were enrolled in the study. ASA Inclusion or exclusion criteria, grade I-II patients of either sex between 18 to 60 years were studied. The patients on corticosteroids, anti-psychotic drugs, β -blockers, statin, diabetics were excluded from the study. All patients were evaluated preanaesthetically for any association of medical disorders. Written valid consent was obtained from every patient. Tab. Alprazolam 0.2mg was given mid night before surgery in every patient. Anxiety score was calculated by Amsterdam Preoperative Anxiety and Information Scale (APAIS) and Verbal Analogue Scale (VAS) score before giving anxiolytics at the time of preanaesthesia evaluation day before surgery and on the day of surgery. First glucose level was assessed preoperative fasting blood sugar, 1 hour after induction and 1 hour of regaining of sensation. Under all aseptic precautions, all patients received subarachnoid block in sitting position at L3-L4 or L4-L5 interspace with 0.5% Bupivacaine, dose of drug depending on age and built of patient. Ringer lactate infusion was started in every patient. Intraoperative all patients were monitored for changes in vital parameters,

Anxiety Score

1. Verbal Analogue scale for Anxiety (VAS)

All patients were asked to rank subjective anxiety on VAS scale of 1 to 10, where 0 stands for no anxiety and 10 stands for worst anxiety.

0 to 3 – low anxiety

4 to 6 – moderate anxiety

7 to 10 – severe or high or worst anxiety

as moderate as compared to low or high score. Postoperatively, VAS score and anxiolytic administration, there was no statistically significant difference.

APAIS score and anxiolytic administration on statistical evaluation, it was observed that before anxiolytic administration, moderate score was significantly more in more number of patients as compared to low or high score. At 1 hour after induction again moderate score significantly observed in more number of patients as compared to low or high scores. Postoperatively again there were no significant differences in APAIS score in anxiolytic administered patients.

Various parameters as the changes in pulse rate, systolic blood pressure, pre and postoperative blood sugar level were monitored in anxiolytic administered and anxiolytic not administered participants. Overall, there was no statistically significant difference in all parameters in both groups. There was insignificant increase in blood sugar level, systolic blood pressure in anxiolytic not administered group at 1 hour after induction and postoperatively.

We have also noted the effect of VAS score on heart rate and blood pressure in patients where anxiolytic drug was not administered. It was observed that there is significant correlation between anxiety at 1 hour after induction measured by VAS score and systolic blood pressure where insignificant decrease in systolic blood pressure was noted. There was no significant difference in other parameters at 1 hour after induction in both groups.

Effects of APAIS score on heart rate and blood pressure in anxiolytic not administered was noted and it was observed that, there was no significant correlation between systolic blood pressure, heart rate and blood sugar level before administration of anxiolytic administration, at 1 hour after induction and postoperatively. There was also no significant difference in all above parameters in anxiolytic administered group in VAS score or APAIS score.

DISCUSSION

From above observations, VAS score and APAIS score were significantly lower among all participants who received anxiolytic drugs as Alprazolam before induction of

anaesthesia during 1 hour after induction and postoperative period. Kim et al., Witte et al., Frassen et al. all have observed that, anxiolytic agents significantly affects VAS and APAIS score in all participants. Mitras et al.²², Khare et al.¹⁶, Pokharel et al.¹⁷, Joseph et al.¹⁸ and Shavakhi et al.²² particularly observed that, preoperative anxiolytic agents significantly does not affect blood sugar level, heart rate and systolic blood pressure at 1 hour and postoperatively in their patients who did not receive anxiolytic agents. There is no either hypoglycemic or hyperglycemic response in any patient in anxiolytic receiving group. Our observation correlates with the observations of above authors and can explained on above grounds.

Surwit et al.²³ reported that, in rats, Alprazolam can increase plasma insulin and reduce blood glucose in response to stress. In the present study, non-diabetic patients were assessed and insignificant reduction in blood sugar level was observed. Hedrington et al.¹⁴, Giardino et al.¹², studied the effect of Alprazolam on neuroendocrine reaction of the body in response to hypoglycemia after administration. They observed that, Alprazolam reduces ACTH and GH response to ITT induced hypoglycemia and there was no effect on level of cortisol. It does not have effect on hypoglycemia induced glucose changes. Overall neuro-adrenergic systems in short term inhibits these actions and prevents blood sugar increase. Our observations can be explained on above grounds.

Anxiolytic drugs when administered prior to induction, insignificantly affects the changes in pulse rate, blood sugar and systolic blood pressure as compared to in those patients where anxiolytic is not administered. It is noted that, there was no significant correlation between blood sugar, heart rate, systolic and diastolic blood pressure before anxiolytic administration, 1 hour after induction and during postoperative assessment.

SUMMARY AND CONCLUSIONS

In the present study, 260 patients of either sex with mean age of 41.68 ± 12.06 years of which 61.4% were male and 38.6% were female. VAS score showed moderate anxiety in 60.8% who received anxiolytic premedication administered and 39.2% of patients showed high anxiety. The same VAS score was observed

in patients who were not given anxiolytic drugs. At 1 hour after premedication, the patients who received anxiolytic drugs, low anxiety score was noted in 23.1%, moderate score in 74.6% and high score in 2.3% of patients. While in those who did not receive anxiolytic premedication, VAS score was low in 9.3%, moderate in 83.3% and high in 5.4% of patients, at 1 hour. The difference was statistically significant. Postoperatively, VAS score was low in 56.2% and moderate in 43.8% who received anxiolytic premedication and it was low in 31.0% and moderate in 69.0% who did not receive anxiolytic premedication. The same findings were there as VAS score with APAIS score. There was significant correlation found between anxiety score at 1 hour after induction measured by VAS score and systolic blood pressure, where increase in anxiety led to decrease in systolic blood pressure and increase in pulse rate. No significant correlation between blood sugar, heart rate, systolic blood pressure before anxiolytic administration at 1 hour after induction and postoperatively.

Before anxiolytic administration mean VAS score was 6.11.3 in those who received anxiolytic and 6.01 ± 1.2 among those who did not receive anxiolytic drugs. One hour after anxiolytic drugs at induction mean VAS score was 4.32 ± 1.03 in those who received anxiolytic drug and 4.87 ± 1.65 in those who did not receive anxiolytic drugs. Postoperatively, VAS score was 3.46 ± 0.72 in anxiolytic administered group and 4.09 ± 1.04 in those no anxiolytic was given.

Again before anxiolytic administration, mean APAIS score was 13.15 ± 2.75 in those who received anxiolytic drugs and 13.41 ± 2.61 in those who did not receive anxiolytic drugs. At 1 hour after induction, APAIS was 11.15 ± 2.75 in anxiolytic administered group and 11.81 ± 2.25 in anxiolytic non administered group. Postoperatively APAIS score was 9.89 ± 1.86 in anxiolytic administered group and 11.40 ± 2.40 in anxiolytic non administered group. No significant changes in blood sugar, systolic blood pressure and heart rate in both groups at all-time intervals in relation to APAIS score.

From the present study, it was concluded that, Alprazolam was found to reduce significantly blood sugar levels in those who were given the drug as premedication as compared to anxiolytic non-administered

group at all time intervals. It provides good anxiolytic effect and is an effective drug for premedication in indicated patients. There was insignificant decrease in systolic blood pressure and increase in heart rate. Thus premedication with anxiolytic drugs is of use to reduce ill effects on blood sugar, blood pressure and heart rate during intraoperative and postoperative period. VAS score and APAIS score are good indicators of anxiolytic parameters.

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