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Annals of Biological Research, 2012, 3 (9):4382-4385
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Oral Diazepam effect on surgical patient's postoperative blood sugar

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ABSTRACT

The hormonal and metabolic changes which follow injury or surgery. Insulin concentration may decrease after the induction of anesthesia and during surgery. Acute hyperglycemia makes the patient's hospital stay longer and later discharge and more expenses, so controlling hormonal changes can be useful for patient, physician and health system either. We conducted this study to find an easy and available way to getting this aim. 80 patients, ASA I and II were allocated in to two groups randomly. Patients in first group received 5mg oral Diazepam with 50cc water at the night before surgery and in the morning of surgery. Patients in control group received no drugs. Blood samples were taken before anesthesia induction and 15min after induction. They were sent to the lab to measure blood sugar level. The data was analyzed using t Student and Chi square test with SPSS software. Rang of pre anesthesia blood sugar in study group were 68-118 mg/dl and in control group was 80-131 mg/dl. These values in intra operative phase in first group were 67-110mg/dl and in control group were 90-131mg/dl (P<0.0001). These results supported that using oral Diazepam as a premedication drug attenuates the hyperglycemic response due to surgical stress-induced release of Catecholamine and Cortisol. So the less hormonal changes, sooner patient discharge, fewer occupied beds in hospitals and less expenses for patients, hospital and health system.

Keywords: Oral Diazepam, surgical patient's, blood glucose, hyperglycemic

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INTRODUCTION

The stress response is the name given to the hormonal and metabolic changes which follow injury or surgery. The responses to surgery have been interested to scientists for many years. In another hand, Insulin concentration may decrease after the induction of anesthesia and during surgery. There is a failure of Insulin secretion to match the catabolic and hyperglycemic responses which result in acute hyperglycemia [1]. Hyperglycemia is a normal response to stress, providing the brain with sugar during the fight response [2]. Acute hyperglycemia makes the patient's hospital stay longer and later discharge and more expensive [3]. So controlling hormonal changes can be useful for patient, physician and health system either and it also appears that per operative maintenance of normoglycemia will become a valid performance measure for practicing surgical specialists [4]. Along with hemodynamic stability and ventilator support, the maintenance of more physiologic blood sugar levels can be added to the list of goals for the anesthesiologist caring for patient undergoing surgery [2]. We conducted this study to find an easy and available way to getting this aim.

MATERIALS AND METHODS

After the approval of Ethics Committee and signing of informed consent, 80 patients of ASA I and II were allocated in to two groups randomly. Group A: Patients who received oral 5mg Diazepam (Watson laboratories, Inc) with 50cc water at the night before surgery and in the morning of surgery. Group B: The control group who received

placebo. The same anesthetic procedure was applied for both groups. Blood samples were taken for blood sugar measurements before anesthesia induction and 15min after induction and collected data was recorded in a form designed for this study. The data was analyzed using SPSS (version 14) software. 95% Confidence level was considered for comparing pre and post operative BS in both groups. BS values were reported as mean and standard deviation. Chi square paired and independent sample t test was used for comparing BS and other variables in two groups.

RESULTS

Regarding to sex distribution, Diazepam group includes 48.8% and 51.3% male and female respectively but control group consists 80.0% and 20.0% male and female respectively. It means the number of males was more in control group (P‹0.001). Age mean in Diazepam group was 40.58±15.06 and in Control group was 34.89±16.67. In fact control group was younger (P=0.025). Mean of pre-operative BS in Diazepam group was 89.49 ±9.57 and in control group was 87.04 ±10.37 which there was no significant difference (P=0.123).

Mean of post operative BS in Diazepam group was 83.83 ±8.710 and in control group was 94.48 ±10.37 (P‹0.001).

Mean of post operative BS has increased 7.44 mg/dl in control group which was significant increase and in another hand, we can see 5.60 mg/dl decrease in Diazepam group which was also a significant decrease (P=‹0.001).(Fig 1)

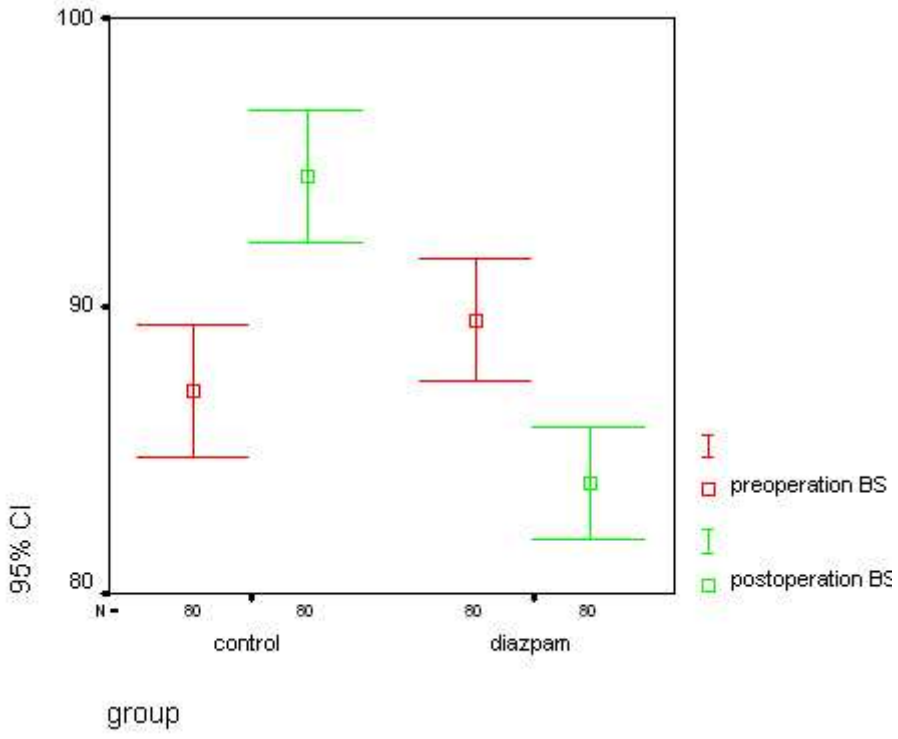

Fig 1: Confidence interval (95%) of pre and post-operative BS in control and diazepam groups.

Median and quartile of pre and post BS measurements in two groups was shown in Fig 2.

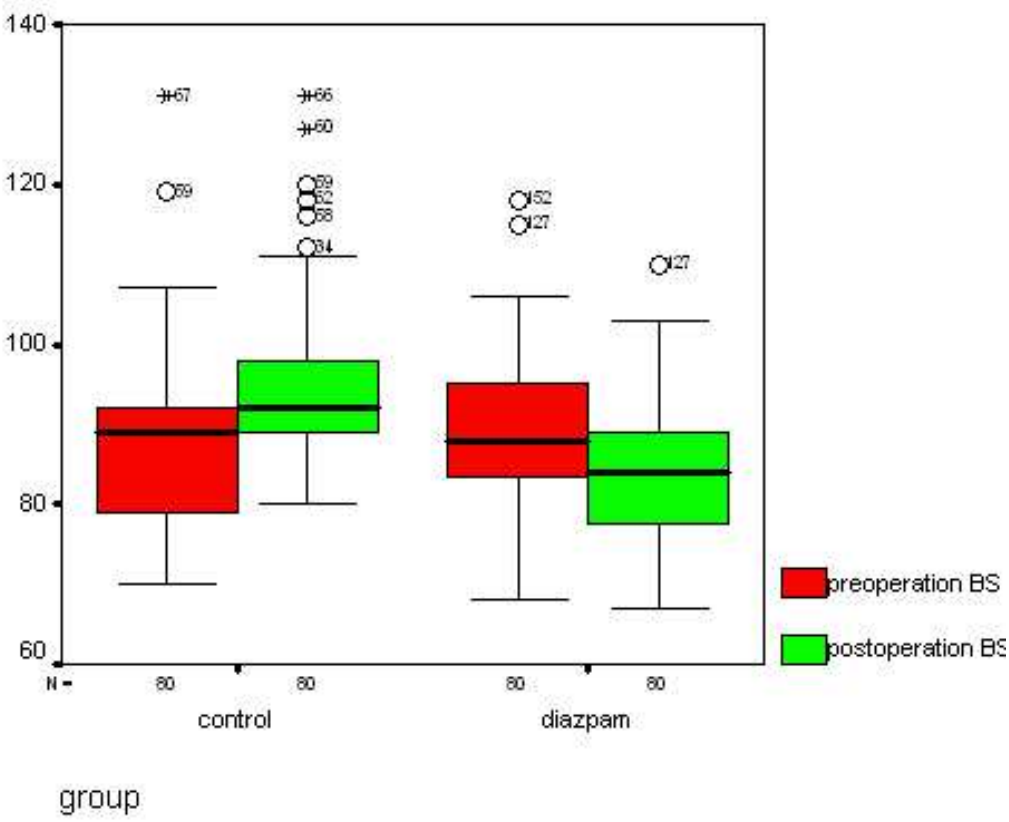

Fig 2: median and quartile of pre and post-operative BS in control and diazepam groups.

Changes in BS values between pre and post operation measurements in two groups were significance difference (P‹0.001). (Fig 3)

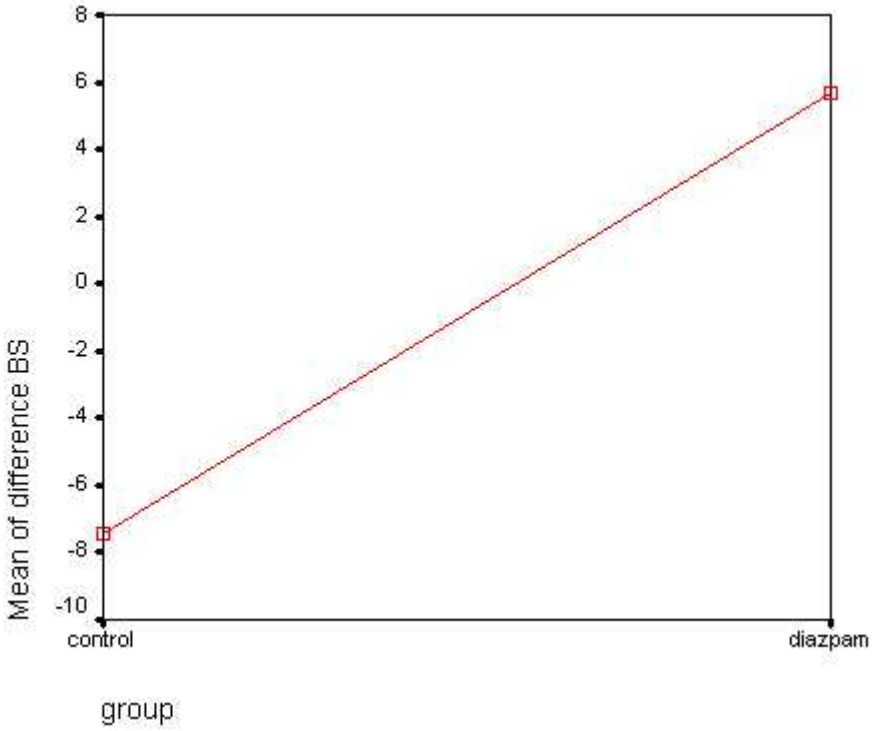

Fig 3: comparison mean of difference BS between pre and post BS in two groups

DISCUSSION

Schaira et al conducted a study to evaluate the effect of Diazepam on blood sugar concentration (BGC) in 10 healthy patients for dental treatment and results of this study showed that a single dose of 5mg Diazepam before dental treatment dose not influence BGC [5]. In other study Rodrigue-Huertas et al evaluated the effects of Benzodiazepines on preoperative secretion of cortisol and ACTH (diazepam 10mg, triazolam 0.5mg, bromazepine 6mg and bromazepam 12 mg) and compared collected results with control group. They concluded that Benzodiazepines failed to modify cortisol and ACTH levels during surgery and during immediate post-operative period [6]. Pekan et al studied 100 patients scheduled for elective gynecologic surgery to investigate oral Diazepam effect on their anxiety. Patients' anxiety level were assessed by using Spielberger State Trait Anxiety Inventory (STAIs) and showed that preoperative sedation by oral Diazepam suppresses the anxiety and the Cortisol augmentation resulting from surgery and stress [7]. Kirvela and Kanto studied clinical and metabolic responses to three types of premedication by a) 0.5 mg Atropine plus 50 mg of Meperidine b) 10 mg of oral Diazepam and an intramuscular placebo (2 ml NaCl 0.9) or c) oral and intramuscular placebo. Collected data indicated that oral Diazepam is superior to combination of an opiate plus Atropine [8]. Nishina used oral Clonidine to influence plasma sugarby modulating endocrinologic responses to surgical stress and they concluded that oral Clonidine pre medication attenuates the hyperglycemic response probably by inhibiting the surgical stress induced release of Catecholamine and Cortisol [9]. Those studies mentioned above support gained results in our study because they suggested that Diazepam can decrease stress and blood sugar increase of surgical patients stress followed by Cortisol and Catecholamies secretion.

CONCLUSION

These data supports that using oral Diazepam as a premedication drug attenuates the hyperglycemic response due to surgical stress induced release of Catecholamines and Cortisol. So the less hormonal changes, the sooner patient discharge, the fewer occupied beds in hospitals and the less expenses for patient, hospital and health system.

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