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RESEARCH ARTICLE

COMPARATIVE STUDY OF HAEMODYNAMIC CHANGES AND BLOOD SUGAR LEVELS BEFORE AND AFTER INDUCTION OF GENERAL ANAESTHESIA WITH ETOMIDATE AND PROPOFOL.

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Abstract

Background: an ideal inducing agent for general anaesthesia should have hemodynamic stability, minimal respiratory side effects and rapid clearance. Presently intravenous drugs such as propofol and etomidate are the most safe for induction of general anaesthesia.^[2-4]

Methodology: in the ot patient received iv midazolam 0.03 mg/kg and iv fentanyl 2mcg/kg five minutes before induction, and was preoxygenated with 100% oxygen. Patient was induced with iv propofol at the dose of 2.5 mg/kg body weight as a induction agent @ <15 sec, and iv etomidate 0.3 mg/kg body weight, for group p and group e respectively iv using peripheral cannula, until the patient's verbal response was lost. Then iv succinylcholine 1.5mg/kg was used as muscle relaxant in both the groups and intubation was done after IPPV, connected to work station and continued with nitrous oxide and oxygen mixture (70:30) and inhalational agent was used to maintain the anaesthesia. After 5 mins of induction, patients blood sugar was recorded in both the groups. Later on as soon as intermediate muscle relaxant was administered i.e. Injection atracurium 0.5mg/kg and continued.

Results and conclusions: from our results and comparison with other studies we conclude that;

1. Etomidate is hemodynamically more stable as induction agent than propofol.
2. Both etomidate and propofol affect blood sugar levels after induction but this affect is slightly more marked in etomidate group as compared to propofol group.

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Introduction:-

Induction of anaesthesia is the critical part of anaesthesia practice. Sudden hypotension, arrhythmias, and cardiovascular collapse are threatening complications following injection of induction agent in hemodynamically unstable patients^[1]. Presently intravenous drugs such as propofol and etomidate are the most safe for induction of general anaesthesia^[2-4]

Propofol anaesthesia has satisfactory recovery, short half-life, rapid elimination from the blood circulation, causing less sedative effect and vomiting are the reasons for using this drug more commonly^[5]

Etomidate is also a short-acting drug, which is usually used for induction and maintenance of anaesthesia^[6]

Materials and Methods:-

After having approval from the institutional scientific and ethics committee, prospective randomized clinical study on 100 patients, with 50 patients in each group.

Group E (Etomidate) and Group P (Propofol) were recruited in the study.

Inclusion criteria:-

Patients those were included in the study -

1. Age 15 to 45 yrs of both sexes
2. ASA grade I and II
3. Not known allergic to mentioned anaesthetic drugs
4. Non diabetic patient
5. Haemodynamically stable patients

Exclusion criteria:-

1. Patient not fulfilling inclusion criteria
2. Lack of patient consent
3. Hypothyroid and hyperthyroid patients
4. Heart block
5. Active disease of CNS

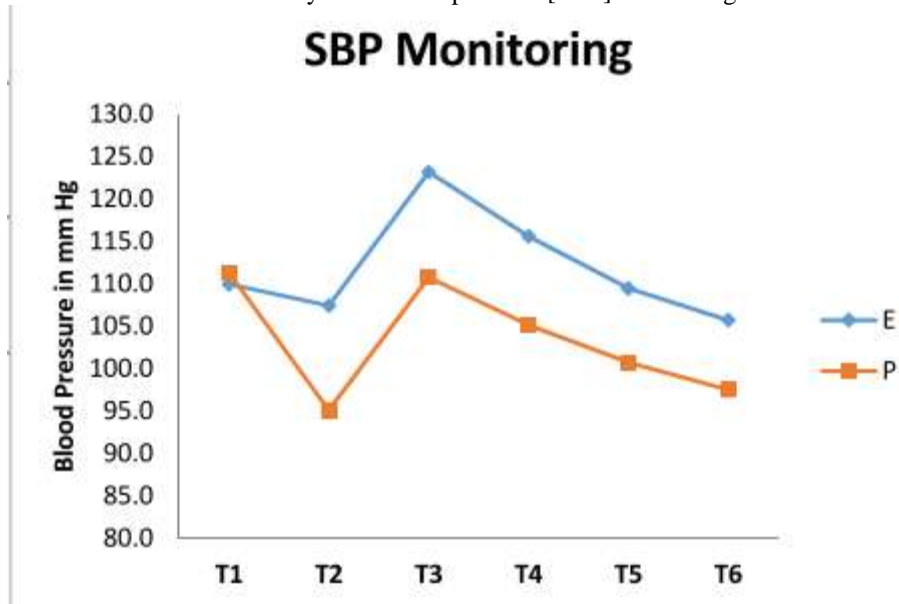
In order to randomize computer generated randomization table was used.

PAC and informed written consent was taken to all patients.

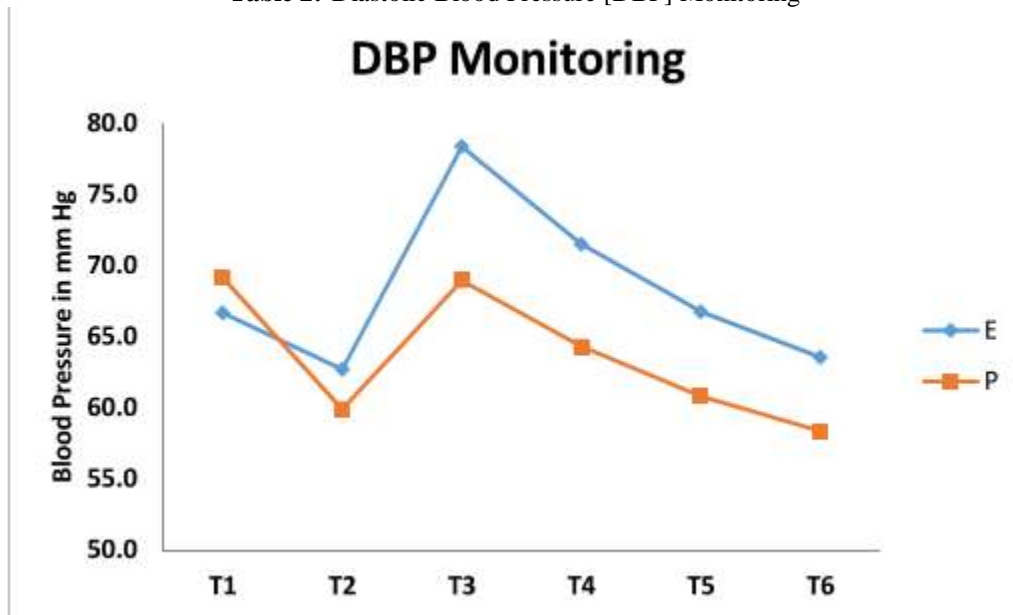
All statistical analyses was performed using the SPSS version 18.0 (SPSS Inc., Chicago, IL, USA). Quantitative data was presented as means and standard deviation (mean \pm sd) and qualitative data as frequency and 95% confidence interval (CI). Age, weight and sex will be analyzed using frequencies test. Systolic, diastolic and mean arterial pressure, as well as heart rate was analysed using unpaired student's t test and analysed with chi-2 or student's t test. Significance defined as $p < 0.05$.

Observations And Results:-

There is not significant about demographic characteristic.

Table 1:-Systolic blood pressure [SBP] monitoring

SBP Monitoring

Table 2:-Diastolic Blood Pressure [DBP] Monitoring**Table 3:-Mean Arterial Pressure [MAP] Monitoring**

	MAP			E			P			p value	
	[mmHg]										
			Mean	Std.			Mean		Std.		
				Deviation				Deviation			
	T1		80.6	7.0			82.5		6.4		0.18
	T2		76.8	7.8			71.0		5.8		<0.001
	T3		92.7	10.5			82.0		8.2		<0.001
	T4		85.3	8.9			77.5		7.3		<0.001
	T5		78.7	13.1			73.5		6.6		0.017
	T6		77.3	8.6			70.6		7.1		<0.001

Table 4:-Heart Rate [HR] Monitoring

HR				E				P					
[per												p value	
			Mean	Std.		Mean	Std.						
minute]				Deviation			Deviation						
T1	83.9	10.4		83.0	12.0		0.72						
T2	81.0	11.1		76.8	13.1		0.11						
T3	96.6	11.2		90.5	15.1		0.29						
T4	90.5	13.2		83.3	12.7		0.008						
T5	84.6	12.6		77.3	11.4		0.04						
T6	80.2	12.4		72.7	11.3		0.03						

RBS Monitoring in Etomidate Group & Paired ~ t Test Results

P value and statistical significance:

The two-tailed P value is less than 0.0001

By conventional criteria, this difference is considered to be extremely statistically significant.

The mean of Group One minus Group Two equals -6.64 95% confidence interval of this difference: From -8.10 to -5.18 Intermediate values used in calculations:

$t = 9.1595$ $df = 49$ Standard error of difference = 0.725

RBS Monitoring in Propofol Group & Paired ~ t Test Results**Statistical significance:-**

The two-tailed P value is less than 0.0001

By conventional criteria, this difference is considered to be extremely statistically significant.

Confidence Interval: 95% confidence interval of this difference: From 4.71 to 7.17 Intermediate values used in

Calculations:-

$t = 9.7314$

Standard error of difference = 0.610

The mean of Group One minus Group Two equals 5.94

RBS monitoring before and After Indication in both the groups etomidate groups 5 min before induction 96.98 and after induction 103.32.

Propofol groups 5 min before induction 98.98 and after induction 93.04.

Tailed paired t-test was applied in both groups. There was a statistically significant ($p < 0.0001$) found between both groups.

Discussion:-

Propofol caused hypotension is due to the reduction of heart's preload and after load, which is not synchronized with heart's compensatory responses such as increased cardiac output and increased HR as seen by *Schmidt C et al* in their study^[8].

In the study of *Hug et al* that was conducted on 25000 patients showed that Propofol would lead to bradycardia in 4.2% of patients and hypotension in 15.7% of patients.^[10] At 5 and 10 minutes after induction HR was decreased significantly which was similar with the findings seen^[11,12,13] in the study by *Ko YK et al.*^[14] In the previous studies done by *Shah SB et al* and *Kaushal RP et al* it was shown that etomidate had more haemodynamic stability

[15,16]

PONV scores were significantly higher in Group IIE compared to the other groups. [19].

In conclusion the results of present study confirmed the other few human studies that propofol prevent increasing in blood glucose during the surgery in comparison to isoflurane anesthesia in our study RBS level is also affected in both propofol and etomidate group. [20]

A.Ramakrishna Rao et al found that in non-diabetic patients, RBS decrease at 5 min after intubation when induced with Propofol and also showed that response to surgical stress in surgeries of less than 2 hrs duration in non diabetics and controlled diabetics can be minimized by using opioids like fentanyl 1 and induction agents like Propofol. [21] in our study we also found low level of RBS from base line in patients of Propofol group.

A propofol infusion technique for maintenance of anesthesia for cardiac surgery where serum lipids and glucose may be of concern could be recommended as an alternative to midazolam.[23] in our study in both the groups RBS was a statically significant difference ($P < 0.0001$) with t value 9.1595 in E group and t value 9.7314 in P group . Another study in contrast to our study by Ram Prasad Kaushal et al who studied for Effect of etomidate and propofol induction on hemodynamic and endocrine response in patients undergoing coronary artery bypass grafting/mitral valve and aortic valve replacement surgery on cardiopulmonary bypass. There was significant increase in blood glucose value during bypass and when weaning off CPB in both groups compared to baseline and between the two groups [24].

Conclusions:-

From our results and comparison with other studies we conclude that;

1. Etomidate is hemodynamically more stable as an induction agent than propofol.
2. Blood sugar levels were found to be slightly increased after 5mins of induction than the baseline level in Etomidate group.
3. Blood sugar levels were found to be slightly decreased after 5mins of induction than the baseline level in propofol group.
4. Both Etomidate and Propofol affect blood sugar levels after induction but this affect is slightly more marked in Etomidate group as compared to Propofol group.

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