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COMPARISON OF EFFECTS OF BMI ON SPINAL ANAESTHESIA IN PREGNANT PATIENTS UNDERGOING CAESAREAN SECTION

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ABSTRACT **Background and Aims:** Regional anaesthesia in obese pregnant patients is associated with numerous complication.Aimof this study is to study the effects of BMI on the Spinal Anaesthesia.

Methods : 200 patients who were posted for elective and emergency caesarean sectionwere included and allocated to Group O(obese) and Group NO(non-obese) based on BMI.

Results:Incidence of hypotension(>20 % fall from baseline) , height of blockade, time to reach highest level, duration of blockade (sensory level to reach T10) and total dose of vasopressor were recorded.Time to reach highest segment was quicker, fall in BP in percentage wise was more and time taken for the sensory blockade level to regress to T10 was more in obese group. Conclusion:It may be concluded that the pregnant patients with BMI more than 25 are prone to get more incidences of hypotension with faster spread of spinal anaesthesia which necessitates a close monitoring.

KEYWORDS : Obesity,Regional Anaesthesia,Hypotension,BMI.

INTRODUCTION :

Obesity characterized as pandemic by WHO, was once considered as disease of upper social economic class is now increasingly common in under privileged. National family health survey (2015-2016) revealed that the incidence of overweight or obese has increased to 20% from 12% in the age group of 15-49 years1.Further females were having higher incidence of overweight/obesity compared to male. Obesity by itself results in more patients coming to caesarean section and the odds of overweight/obese patients landing in operation theater for caesarean section is 2.32. Body mass index(BMI) of more than 30 is considered as obesity and 25-29 as overweight as per current recommendation by WHO3.However consensus meeting for Asian specific guidelines based on various studies placed a cut off at 25 for obesity for Indians and 23-24.9 as overweight4.Even though regional anaesthesia is the preferred technique in obese pregnant patients because of better safety profile there are many challenges.Regional anaesthesia in obese pregnant patients is associated with numerous complications starting from difficulty in identifying the space,more number of attempts, insufficient duration of regional anaesthesia,increased need of iv supplementation because of prolonged duration of surgery and higher incidence of high spinal and profound intra operative hypotension5 .Aim of our study was to study the effects of BMI on the Spinal Anaesthesia with respect to incidence of hypotension, height of sensory blockade and time to regress to T10 level. Side effects like vomiting, high spinal and postdural puncture headache were measured as secondary outcome.

METHODOLOGY:

The study was conducted at post graduate institute K.A.P.V medical college, Trichy over a period of 3 months from May- July 2017.It was a prospective randomized controlled study. Ethical committee approval was obtained. 200 patients who were posted for elective and emergency caesarean section with a height of more than 150 cm were enrolled into the study. After getting informed written consent, they were allocated into one of the two groups based on their BMI.Group O(obese) if BMI was more than 25 and Group NO(non-obese) if BMI was less than 25.Patients with BMI less than 15, gestational diabetes, pregnancy induced hypertension, twins pregnancy,patients with contraindication for spinal anaesthesia like coagulation disorder,localised infection at the site of injection,neurological disorders, h/O allergy to local anaesthetics, ASA 3 and ASA 4 patientswere excluded from the study.BMI was derived based on Quetelet index measuring the weight in kg and height in meter2. All patients were preloaded with 10 ml/kg of ringer lactate and anti-aspiration prophylaxis was given with metaclopramide 10 mg and ranitidine 50mg intravenously. Inside the operating room the patients were connected to multi para monitor consisting of pulseoximeter and noninvasive bloodpressure. Subarachnoid block was performed in right lateral position at L3-L4 or L4-L5 interspace with 25 G Quinckes needle and 2 ml of 0.5 % hyperbaric bupivacaine given. Incidence of hypotension(>20 % fall from baseline) , height of blockade, time to reach highest level, duration of blockade (sensory level to reach T10) and total dose of vasopressor were recorded. As a secondary outcome incidence of vomiting, postdural puncture headache and high spinal anaesthesia were recorded. Sensory level was tested initially every 1 min for first 5 min in midaxillary line with 25G needle after spinal anaesthesia and every 5 minutes for 20 minutes to determine time to reach maximum height of blockade. To determine the time to reach T10 segment sensory level was assessed every 15 min after surgery until T10 segment is reached . Patients who had difficulty in speech, difficulty in hand grip were considered as high spinal anaesthesia. Patients were monitored for 48 hrs for post dural puncture headache. After delivery of the baby all patients were given intravenous oxytocin 10 units as slow infusion over a period of 20 min and intramuscular injection of 10 units. Patients with hypotension of more than 20% from the base line were treated with repeated dose of inj.Ephedrine bolus 6mg All statistical analysis were performed with SPSS software (version 20.0, SPSS Inc., Chicago, IL, USA).

Categorical variables were expressed as frequency and percentage, whereas continuousvariables were represented as means with standard deviation.Differences were considered as statistically significant at $P < 0.05$.

RESULTS :

100 parturients were included in Group O and NO each. The two groups were comparable in terms of age and height. There was a difference with respect to weight and BMI which was statistically significant.

Table 1: Demographic Profile

Variable	Non- Obese	Obese	p- value
Age(yrs)	24.92	25.32	0.34
Height(cm)	153.92	154.62	0.295
Weight(kg)	51.95	69.05	0.00
BMI	23.90	28.93	0.014

Table 2:Comparison of various Parameters

PARAMETER	Obese	Non-Obese	p-value
Highest Level of block	3.33	4.24	0.00
Time to reach highest segment(min)	2.98	3.50	0.008

Time to regress to T10(min)	122.34	114.54	0.00
Maximum % fall in BP	21.46	18.45	0.005
Time of maximum% fall in BP (min)	8.15	8.54	0.720
Volume of crystalloids(ml)	1911.00	1817.50	0.00

Even though the level of block was high in obese group as expected and statistically significant clinically it was only one segment higher. Time to reach highest segment(min)was quicker in obese group and statistically significant clinically, the difference was less than 1 minute.Time taken for the sensory blockade level to regress to T10 was more in obese group (almost 8 min).Fall in BP in percentage wise was more in obese group and statistically significant but clinically the difference was only 3%.There was no difference in the time of maximum fall in BP between the groups with maximum fall occurring around 8 min after giving spinal anaesthesia. The difference in the volume of crystalloids used was only 100 ml however it was statically significant.

Table 3: Incidence of side effects

	Non-obese	Obese	p-value
High Spinal	0	0	0
PDPH	0.04	0.01	0.176
Vomiting	0.08	0.14	0.177

There was no difference in the incidence of headache ,vomiting between obese and non obese patients. Similar results were obtained in study by bamgbade etal.6

DISCUSSION:

Results of our study show that maximum fall in blood pressure was higher in obese groups. Our findings were similar to study by edomwonyi and osaigbovo7were the incidence of hypotension was higher in obese group compared to nonobese.

In our study even though the height of the sensory block was higher in obese patients when compared to non obese group statistically, clinically the difference was only one segment. Study by pitkanen8concluded similarly there is no difference between block height between obese and non obese patients. The higher block level in obese patients was presumed to be due to reduced CSF volume because of extra epidural fat in obese patient resulting in more cephalic spread of the drug.The time to regression to T 10 segment was prolonged in obese group in our study. Studies involving MRI had demonstrated that obese patients have decreased CSF Voulme9. Reduced CSF volume was also responsible for slow regression of block level to reach T10 dermatome in obese patients.Further increased fat in abdomen in turn increases abdominal pressure there by compressing inferior venacava and hence increased blood flow through epidural veins .This distended epidural veins compress the CSF space thereby decreasing the CSF volume and enhancing the cephalad spread of the drug.This has been demonstrated using myelography.Incidence of PDPH in obese patients is considered less in comparison to non obese patients once again due to extra fat in epidural layerwhich reduces the leak as well as due to the pressure difference between the epidural and subarachnoid space[10].

CONCLUSION :

It may be concluded that the pregnant patients with BMI more than 25 are prone to get more incidences of hypotension with faster spread of spinal anaesthesia which necessitates a close monitoring. One of the main limitations in our study was in obese group most of them had BMI below 30.Had we enrolled more patients with BMI more than 30 clinical significance would have been more.

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