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Original Article

Incidence of supine hypotension syndrome among parturients during caesarean section under spinal anaesthesia with or without wedge under right buttock -A Comparative study

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Abstract

Background: Supine hypotension syndrome among parturients during caesarean sections under spinal anesthesia may result in shock which can cause fatal maternal and foetal outcome.

Objectives: The aim of study is to compare incidence of supine hypotension syndrome among parturients during caesarean sections under SAB with or without wedge under the right buttock.

Methods: Sixty term parturients at childbearing age of a of ASA grade I & II were randomly selected for caesarean sections under SAB and divided equally into two groups:

NWG-Non Wedge group (n=30)
WG- Wedge group (n=30)

In Non Wedge group parturients were kept in supine position without using wedge under right buttock and in Wedge group parturients were tilted 15° left lateral by using wedge under right buttock.Caesarean sections were performed under SAB using minimum effective dose (ED95) of 0.5% hyperbaric bupivacaine(.06mg/cm of height) and parturients were preloaded with isotonic crystalloid solution.

Parametric data like pulse, blood pressure among groups were analyzed by ANOVA test.

Results: The results revealed that the incidence of supine hypotension syndrome between two groups were not statistically significant.

Conclusion: It can be concluded that caesarean sections can be done with hemodynamic stability under SAB without wedge under right buttock among parturients by using minimum effective dose(ED95)of 0.5% hyperbaric bupivacaine (.06mg/cm of height) and after preloading with isotonic crystalloid solution without affecting maternal as well as foetal outcome. In supine position of the patient without wedge the surgeon is more comfortable and gets better operative field.

Keywords: Caesarean Section, Spinal Anaesthesia, Supine Hypotension Syndrome, Wedge under right buttock.

Introduction:

Caesarean section is the most common operation in the childbearing age of a women.[1] C-section is necessary to perform in critical conditions where vaginal delivery would put the baby or mother's life in danger. The rate is increasing dramatically in recent years. In few countries caesarean sections were performing more frequently than necessary whereas many governments and health organizations promote programs to reduce the use of C-section in favor of vaginal delivery.[2]

Hypotension is the most common complication of spinal anaesthesia.[3] Among the parturient in supine position gravid uterus causes aortocaval copmpression during C-section under SAB and may results in shock which causes fatal outcome of mother as well as foetus.[4] Supine hypotension syndrome can be prevented by manual displacement of uterus with the hands of anaesthesiologist ,left lateral tilting of the OT table or placing the wedge under right buttock to tilt the parturient 15° left lateral position.[5,6,7] Manual displacement of uterus engages anaesthesiolosist and prevents monitoring of the patient. On the other hand changing the maternal position or changing the position of OT table hampers the comfort of the surgeon and provides poor operative field.

In this study we have compared incidence of supine

hypotension syndrome between two groups of parturients during C-section under SAB with or without wedge under the right buttock. In order to limit hypotension related to spinal block in this study we have used minimum effective dose(ED95) of 0.5% hyperbaric bupivacaine (.06mg/cm of height)8 for caesarean section under SAB and parrturients have been preloaded with isotonic crystalloid solution.

Material and Methods:

After obtaining written informed consent, 60 parturients at term (ASA grade I and II ,at child bearing age) were enrolled for the study . The study was conducted in Dhaka National Medical College Hospital from May 2016 to April 2017. Patients fulfilled following inclusion criteria: ASA I or II, at child bearing age, BMI ≤ 32, and normal coagulation profile. The patients in whom regional anaesthesia were contraindicated or patients with foetal abnormalities,pre eclampsia,eclampsia were excluded from the study. Patients were randomly divided into two equal groups as follows: Wedge group : WG group :(n=30) , Non wedge group : NWG group.(n=30).

All parturients were instructed for overnight fasting, prescribed injection ondensetron 8 mg intravenously 1 hour before surgery. In the operation theatre, all parturients were preloaded with 15mlkg^{-1} Ringer's Lactate Solution. Under full aseptic precaution lumbar puncture was performed with 25G Quencke's spinal needle in L_{3-4} or L_{4-5} inter space in sitting position and minimum effective dose(.06mg/cm of height) of 0.5% hyperbaric bupivacaine were injected as per groups of the parturient. In Non Wedge group parturients were kept in supine position without using wedge under right buttock and in Wedge group parturients were tilted 15o left lateral by using wedge under right buttock.Level of sensory block and grading of the motor block was noted. All parturients received O_2 3L/min. via facemask. Immediate after administration of SAB pulse, blood pressure and rate of respiration was recorded. Then pulse, BP, respiratory rate recorded every 3min. for first 20 minutes, at 5 min. interval for remaining period of operation.

Monitoring of patients were clinical and instrumental. Blood pressure were recoded by NIBP. Hypotension defined as a decrease in SBP more than 20% from the base line was treated with bolus intravenous 5mg increaments of ephedrine. Oxygenation of patients were monitored by SpO_2 during per & post operative period. Respiratory rate, pulse rate were recorded clinically during perioperative period. All data were compiled and analyzed using ANOVA or chi-square tests as appropriate with the help of SPSS window version 11. The results were regarded as significant if p value <0.05.

Results:

Sixety terms parturients were included in this study. They were randomly allocated into 2 groups, 30 in each group (Gr-WG, and Gr-NWG)

Table-I: Demographic profile of the study population

Parameters	Gr-WG	Gr-NWG	F value	P value
Age in year	25±3	25±3	0.054	0.947
Weight in kg	51±6	52±5	0.828	0.440
Height in cm	153±8	155±8	1.37	0.259
Duration of operation(min.)	45±3	44±3	1.82	0.167

Values are expressed as Mean ± SD, analysis among groups were done by ANOVA test. Values were regarded as significant if p<0.05.

There were no statistically significant difference in age (p=0.947), weight (p=0.440) and height (p=0.259) among groups. Therefore, patient in these groups were homogeneous regarding demographic characters.

Table-II

SAB data group WG vs NWG

Parameter	Gr-WG	Gr-NWG	χ^2 value	P value
Age ilevel of sensory block at 20 min. T4 T5	29(96.66%) 1(3.33%)	30(100%)	4.286	1.38
Quality of motor block (Bromage scale) Grade 3 Grade 2	29(96.66%) (3.33%)	30(100%)	1.741	1.45

Data are presented as frequencies and analyzed among groups with χ^2 test. Values are regarded significant if p<0.05.

Level of sensory block and quality of motor block in between Gr-WG and Gr-NWG are presented in table-II. Level of sensory block as well as motor block in Gr-WG and Gr- NWG were not statistically significant.

Table-III

Incidence of hypotension

Parameter	Group-WG	Group -NWG	χ^2 value	P value
Ephedrine given	1(3.33%)	2(6.66%)	6.923	1.031

Data are presented as frequencies and analyzed among groups with χ^2 test. Values are regarded significant if $p<0.05$.

Incidence of supine hypotension syndrome was considered in terms of hypotension in both groups. Systolic blood pressure less than 20% from base line was taken as hypotension. Patients undergoing hypotension were given ephedrine, In group WG 1(3.33%) & group NWG 2(6.66%) parturient developed hypotension. Comparison of the incidence of supine hypotension syndrome among groups were not statistically significant (p=1.031).

Table-IV: Foetal outcome

Apgar score	Group WG	Group NWG
1 min	8-9	7-8
5 min	9-10	9-10

Foetal outcome in both groups were similar and uneventful.

Discussion:

Supine hypotension syndrome results in severe adverse effects. Pressure of Gravid uterus over inferior venacava results in decreased venous return and cardiac output causing syncope.[9,10] To alleviate supine hypotension syndrome different methods were tried, includes full lateral position, tilt of operation table,[11] placing waterbags, rubberwedges, airbags, sand bags under the hip or flank, mechanical displacement.[12] Among these traditionally using methods are wedge under the right hip. Various studies are going on proper positioning of the mother during C-section to provide better outcome to mother and child and also to prevent supine hypotension syndrome. Here in this study we tried to determine the position of the mother during C-section with cardiovascular stability by avoiding supine hypotension syndrome and providing comfort of the surgeon, good operative field.

12 cm wedge under the right buttock can give to mother up to 150 left lateral tilt. In one study the author[13] used 15° left lateral tilt for positioning of pregnant women by using wedge under right buttock in preventing supine hypotension syndrome .Caval and aortic compression still occurred in many studies whatever the degree of tilt , even at 34°.[14] There are evidences that haemodynamic stability can be obtained by manual uterine displacement by the hands of anaesthesiologist[15] or by full lateral position of the parturient[16] which is not practically feasible in providing comfort to the surgeon as well as good operative field. Besides manual displacement of uterus by the hands of the anaesthesiologist will engase anaesthesiologist and hamper monitoring of the patient which can endanger maternal as well as foetal life.

In one study it was shown that the use of wedge under right buttock was not effective in reducing incidence of supine hypotension syndrome during SAB for caesarean section. Preloading with isotonic crystalloid solution and use of minimum effective dose of local anaesthetic was effective in reducing incidence of supine hypotension syndrome.[17] This observation is consistent with our study. In our study we used minimum effective dose (ED95)[8] of 0.5% hyperbaric bupivacaine and all parturients were preloaded with isotonic crystalloid solution. In group WG 1patient & in group NWG 2 patients developed hypotension which was statistacally not significant. Foetal outcome in both groups was similar and uneventful.

Conclusion:

It can be concluded that caesarean sections can be done with hemodynamic stability under SAB without wedge under right buttock among parturients by using minimum effective dose (ED95) of 0.5% hyperbaric bupivacaine (.06mg/cm of height) and after preloading with isotonic crystalloid solution without affecting maternal as well as foetal outcome. In supine position of the patient without wedge the surgeon is more comfortable and gets better operative field.

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