Spinal Anaesthesia vs General Anaesthesia in Case of Caesarean Section

*Hossain MA, Begum J

A prospective study was carried out in the Department of Obstetrics and Gynaecology of Dinajpur Medical College Hospital, Dinajpur to compare the two technique of anaesthesia - one is Spinal and the other is General with the aim to find out the scope of practicing spinal anaesthesia and to avoid costly, risky and hazardous general anaesthesia in case of caesarean section where there is no contraindication. With this aim 100 patients were randomly studied. The total number of patients were assigned in two groups equally: 50 patients (S-50) under went caesarean section under spinal anaesthesia and 50 (G-50) under general anaesthesia. The S-50 group was preloaded with one liter of crystalloid fluid before giving spinal anaesthesia. There was no preloading in G-50 group but I/V channel opened with sorts of fluids. The two groups were compared in respect of preoperative status of blood pressure, Nausea and vomiting, shivering, post operative headache. Findings and observations were compared side by side between the two groups. Results of this study show that in spinal anaesthesia in caesarean section, postoperative headache and per operative hypotension, is a considerable problems. Yet this study shows most of the post operative headache is vague and non specific, only 8% is of true post spinal headache. Though per operative blood pressure drop in spinal anaesthesia was found more in this study yet we think this problems may be overcome by adequate pre-load, using pressor drugs and close monitoring. In association with the results of this study, if we consider the cost of machine, equipments, logistics, drugs and manpower involved in general anaesthesia and over all the availability of these factors – it becomes obvious that though there are some limitations yet spinal anaesthesia is better in case of caesarean section.

Key words: Spinal, General anaesthesia, caesarean section

Introduction

Caesarean sections now a days the commonest major operation in the department of obstetrics and gynaecology in the government hospitals and also in non-government hospitals and clinics. The incidence of caesarean section has been rising throughout the industrialized world, although there are considerable variations in rates and practice among countries, geographical areas and hospitals. In the UK the overall incidence is 13 percent. In Brazil one in three women is delivered by caesarean section.

The application of this operation has been widely liberalized owing to refinement and recent development in surgical technique, asepsis, antibiotic therapy, blood transfusion and above all the anaesthetic techniques which have brought down the risk of caesarean section to minimal proportion, yet the percentage of maternal deaths attributable to general anaesthesia is more. Anaesthesia is now the third most common cause of maternal death. Because the profound physiological effects of pregnancy have an important role in altering the maternal response to systemically administered anaesthetics, analgesics and vertebral blocks. Moreover deaths associated with anaesthesia are related most frequently to difficulties with tracheal intubation or pneumonitis resulting from aspiration of...
gastric contents. Most of these deaths follow anaesthesia for caesarean section. Difficulties in tracheal intubation occur more frequently in obstetrics anaesthesia, the incidence of failed intubation being approximately 1 in 280 compared with 1 in 2230 in surgical patients. General anaesthesia has the advantages of speed of onset, less hypotension, a lower failure rate, fewer contraindication, and being more acceptable to some patients, when compared with regional anaesthesia. Nevertheless, there are more death with general anaesthesia. The condition of the infant is directly related to the interval between incision of the uterus to delivery.

With the advances in modern anesthesiology popularity of spinal and epidural anaesthesia are increasing. In case of caesarean section spinal and epidural anaesthesia became the anaesthesia of choice in certain parts of the world: in fact that caesarean section can be performed very satisfactorily under regional anaesthesia. It is assumed that these technique reduced the risk of aspiration of gastric contents.

However the regional anaesthesia is not suitable for all patients and general anaesthesia will always have an important role in obstetric practice. In addition there is a small risk of loss of airway reflexes in patient who receive a high extradural or subarachnoid block of caesarean section.

In case of general anaesthesia there is involvement of many drugs, volatile and non volatile gases, valuable equipment’s specially an anaesthetic machine which is very costly and also not available in all health centers of Bangladesh. On the contrary spinal and epidural anaesthesia requires less drugs and less costly equipments.

As both general and regional (specially spinal) anaesthesia are involved with caesarean section which one is better it is a general question. Possibly in rural area in our country there is no such study in this respect. Considering the various advantage and disadvantages of general anaesthesia and spinal or epidural anaesthesia it is a common saying that the spinal anaesthesia may be more practicable, effective, less costly and convenient in case of obstetrical practice specially in caesarean section.

Prior to its widespread practice in rural area, a study and substantial evidence is essential. So it has been decided to carry out a comparative study of spinal anaesthesia vs. general anaesthesia in case of caesarean section. This study was carried out to find out the scope of practicing spinal anaesthesia in caesarean section in all health centers, especially in rural area of our country and to avoid costly and relatively risky and hazardous general anaesthesia in case of caesarean section.

Methods
This study was done in the department of Obstetrics and Gynaecology, Dinajpur Medical College Hospital, Dinajpur. Study period extended from January to December 2001. In this study 100 patients of caesarean section were taken randomly, among them 50 underwent caesarean section under General anaesthesia and another 50 under went spinal anaesthesia.

Those whose caesarean sections were done under general anaesthesia (GA) were grouped as ‘G-50’. Those whose caesarean sections were done under spinal anaesthesia were grouped as ‘S-50’. Both the group of patients were studied with reference to the same evaluation sheet, with special emphasis to changes in blood pressure, post operative headache, nausea and vomiting, shivering, post operative cough, fluid requirements,
initiation of diet, time of ambulation and foetal outcome. Data was compiled and compared side by side.

A total of 50 patients in this study were operated under spinal anaesthesia with 0.5% Bupivacaine. Fifty patients were included whose caesarean section were done under general anaesthesia using conventional induction agents, muscle relaxants, gaseous agents of maintenance & usual drugs of reversal. In case of spinal anaesthesia routine preloading of the patient was done with 1 liter of crystalloid fluids. In case of general anaesthesia no routine preloading was done but there was an I/V channel with crystalloid fluids. Blood pressure before operation, during operation and after operation were recorded. Gastrointestinal complications during & after operation were recorded and assessed clinically. Postoperative headache was detected by asking the patient. Post spinal headache was detected by asking the patient & correlating the intensity of the headache with ambulation.

**Results**

**Blood Pressure:**

Even though preloading technique was practiced in all the patients of ‘S-50’ group, a significant lowering of the blood pressure was observed in this group. In ‘G-50’ group there was also few cases of lowering of blood pressure but not so significant like that of ‘S-50’ group. This difference was prominent during per operative period, but post operatively there was no significant difference between the two groups.

**Table I: Comparison of blood pressure rise & fall between the group ‘G-50’ & ‘S-50’ in per operative period**

<table>
<thead>
<tr>
<th>Group</th>
<th>BP Rise</th>
<th>BP Fall</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-50</td>
<td>8%</td>
<td>18%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>S-50</td>
<td>-</td>
<td>32%</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**Nausea & Vomiting:**

In this study it was found that the ‘G-50’ group was totally free from nausea and vomiting during the period of operation, because they were under GA and thereby unconscious through out the period of operation. In ‘S-50’ group 32% patient was found to suffer from either nausea or vomiting. But in the post operative period, picture was different. In ‘G-50’ group 26% were found to suffer from nausea or vomiting. But only 12% patients were from ‘S-50’ group.

**Shivering:**

There was 28% patient from ‘S-50’ group who suffered from shivering during operation. There was a strong association among the fall of BP, excess fluid requirement & shivering. Because most of the patient who suffered from fall of B.P. and required at least more than 2000 ml of fluid to raise the blood pressure upto the base level. But there was none to shiver per-operatively from ‘G-50’ group. In post operative period the incidence was almost reverse. It was seen that 22% from ‘G-50’ & only 6% from ‘S-50’ group suffered from shivering.

**Table II: Comparison of blood pressure rise & fall between the group ‘G-50’ & ‘S-50’ in post operative period**

<table>
<thead>
<tr>
<th>Group</th>
<th>BP Rise</th>
<th>BP Fall</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-50</td>
<td>6%</td>
<td>12%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>S-50</td>
<td>2%</td>
<td>10%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Table III: Comparison of Nausea/Vomiting & shivering in post operative period between the ‘G-50’ & ‘S-50’ group

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>‘G-50’ group</th>
<th>‘S-50’ group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-operative</td>
<td>Post-operative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>period</td>
<td>period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausea/Vomiting</td>
<td>26%</td>
<td>12%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Shivering</td>
<td>22%</td>
<td>6%</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Post Operative Headache:

During enquiry in the post operative period about headache, 18% from ‘S-50’ group complains of headache. An attempt was made to correlate this headache with ambulation, change of posture like sitting and standing to detect whether it was really the post spinal headache or not & it was found that 8% of the patients were really suffering from post-spinal headache. In ‘G-50’ group only 6% patient complains of post operative headache.

Table IV: Comparison of post operative headache in ‘G-50’ & ‘S-50’ group

<table>
<thead>
<tr>
<th>Post-operative Headache</th>
<th>‘G-50’ group</th>
<th>‘S-50’ group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6%</td>
<td>18%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Discussion

Bangladesh is thickly populated country and 80% of the total population live in the rural areas. Where doctor patient ratio is very less than the urban and city. Maternal mortality is much more in rural areas than in the city. Various causes of death among them like obstructed labour, antepartum haemorrhage, abnormal presentation etc. are important. Most of the causes of maternal death can be prevented by performing caesarean section in appropriate time. But facilities for anaesthesia are not available there and patient usually died during the process of transfer from those remote areas to the hospitals or medical institutions.

As technique of spinal anaesthesia is relatively simpler and less hazardous and can be performed by our available manpower in rural areas if they are well trained in this aspect. So that we can save the life of many mothers and babies. But the question arises on those sectors where spinal anaesthesia is getting more popular than general, whether really spinal anaesthesia is better than general or not.

Study of Russell (in spinal anaesthesia for caesarean section) was most convincing and impressive. In his study 64% patient became hypotensive, systolic arterial pressure less than 100 mmHg though a fluid load was administered in over 5-10 minutes.

In the study of Corke et al (in spinal anaesthesia for caesarean section) reported that maternal hypotension during spinal anaesthesia even after prophylactic measure, the incidence has been quoted as high as 80%. In our study it was found that per operative blood pressure drop was only 32% in spinal anaesthesia (S-50) which was less than that of the above mentioned studies.

In the study of Russell the frequency of headache was 24% but in my study post operative headache of spinal anaesthesia was found 18% among them 8% was of true post spinal headache of definite characteristics. In the study of Sarker (comparative study between post operative oral and intravenous hydration after caesarean section under spinal anaesthesia) he mentioned 8.3% of patient of spinal anaesthesia in caesarean section suffered from nausea and vomiting, but in my study, I found it was 12% where as in case of General anaesthesia it was 26%.

Internationally, obstetric anaesthesia guidelines recommend spinal and epidural
over general anaesthesia (GA) for most caesarean sections (CSs). The primary reason for recommending regional blocks is the risk of failed endotracheal intubation and aspiration of gastric contents in pregnant women who undergo GA.

Conclusion

Considering the background of the effects on different systems of mother and foetus in association with the observation, findings results of the present study and also the cost, effectiveness on simplicity of the technique of spinal anaesthesia, it can be concluded that there is a definite scope for widely practicing this technique in case of caesarean section where there is no contra indication. Before going for universal practice its safety is further to be evaluated in a large group of parturients. Undoubtedly this is very small study. It should be substantiated by further large scale study and definitely this will reduce the economic burden, involvement of skilled manpower, life threatening risks sometimes associated with general anaesthesia and will make a wide field of the operation like caesarean section in rural areas of our poor country.

References

5. Pallazo MGA, StuninL. Anaesthesia and emesis. II. Presentation and management.
17. American Society of Anesthesiologists Task Force on Obstetric Anaesthesia: