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Research Paper

Spinal Anaesthesia in Lower Abdominal and Limb Surgery for Adult in Tertiary Care Hospital, Dhaka, Bangladesh.

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ABSTRACT

Background: *Modern technology has produced better equipment than was available hitherto with the result that spinal anaesthesia is undoubtedly simpler, cheaper and above all, safer than it used to be. These notwithstanding, it is used infrequently.*

Aim of the study: *The aim of the study was to evaluate the clinical outcome, safety and efficacy of Spinal Anaesthesia inLowerAbdominalandLimbSurgery for Adult in Tertiary Care Hospital, Dhaka, Bangladesh.*

Methods: *This is a prospective study, a total of 112 patients enrolled and analyzed who received subarachnoid blocks for various surgical procedures. The study was conducted from January 2021 to December 2021 at the department of surgery in* Central Hospital *Ltd, Dhaka, Bangladesh.*

Result: *A total of 112 patients were analyzed in this prospective study. Almost 50% of patients in the study were from the age group 20-40 years, 40(35.71%) patients were older than 40 years and 17(15.18%) patients were aged less than 20 years.the surgical procedures performed in this study; the majority of the study population was from caesarian section (40.18%), 14(12.50%) patients had transurethral resection of prostate (TURP)13(11.61%) patients had an appendicectomy, 11(9.82%) patients had a herniorrhaphy and 6(5.36%) patients had a haemorrhoidectomy and others.*

Conclusion: *Spinal anaesthesia though safe is not without hazards. Spinal anaesthesia may be used for most operations in the lower abdomen (including caesarian section), perineum or leg.*

Keywords: *SpinalAnaesthesia, LowerAbdominal, LimbSurgery, Adult*

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I. INTRODUCTION

Spinal anaesthesia is a commonly used regional anaesthesia technique for lower limb and lower abdominal surgeries owing to its well-known advantages like quick onset, excellent sensory and motor block and avoidance of complications of general anaesthesia [1]. The widely used local anaesthetic in spinal anaesthesia is bupivacaine 0.5% heavy which is available in a commercial preparation as a racemic mixture (50:50) of its two enantiomers, levobupivacaine, S (−) isomer and dextrobupivacaine, R (+) isomer [2,3]. Severe Central Nervous System (CNS) and cardiovascular adverse reactions reported in the literature after inadvertent intravascular injection or intravenous regional anesthesia have been linked to the R (+) isomer of bupivacaine [3]. In the last few years, its pure S-enantiomer levobupivacaine, has been introduced into clinical practice because of its lower toxic effects on heart and CNS [4-6]. Bupivacaine and levobupivacaine both have been evaluated in many studies and have been found to have almost similar anaesthesia profile [2], [7-15]. However, in some of the studies, the onset, intensity and duration of motor block with levobupivacaine has been found to be different from bupivacaine [16-23]. The aim of the study was to evaluate the clinical outcome, safety and efficacy of Spinal Anaesthesia inLowerAbdominalandLimbSurgery for Adult in tertiary care Hospital, Dhaka, Bangladesh.

II. METHODOLOGY & MATERIALS

This is a prospective study, a total of 112 patients enrolled and analyzed who received subarachnoid blocks for various surgical procedures. The study was conducted from January 2021 to December 2021 at the department of surgery in Central Hospital Ltd, Dhaka, Bangladesh. The procedure was explained to the patients, and their informed consent was obtained. The opinions of patients regarding the choice of anaesthesia were sought. The reasons for choosing the preferred methods of anaesthesia were also obtained from the patients. Subarachnoid puncture was aseptically performed either in the L2/3 or L3/4 interspace after an intravenous infusion line had been set up with a normal saline solution and the patient's cardiovascular system preloaded. The amount of fluid used for preloading varied depending on the patient's age, size, and preoperative condition but was generally between 500 to 1000 mls over 15 to 30 minutes (10ml/kg body weight). The puncture was generally performed with the patient in the sitting position.

- **Inclusion criteria:**

Patients who underwent abdominal and organ surgery. (ASA grade 1and 2).

- **Exclusion criteria:**

Patients with uncorrected or under-corrected hypovolaemia, uncorrected anaemia or heart disease, local sepsis and, those with bleeding disorders. Also excluded from the study were children.

However, major neurological sequelae are extremely rare if a proper technique is patients were laid supine immediately after the subarachnoid injection was administered with one pillow under their heads. Subarachnoid anaesthesia for caesarian section was performed with the patient supported in the sitting position and then turned into the horizontal position but with the pelvis wedged to keep it tilted immediately after injection. Oxygen was given to all the mothers during the operation. Adequate postoperative hydration was ensured to reduce the risk of post-spinal headaches as the mothers needed to sit up to nurse their babies. Sizes 25 g or 27gQuincke Backok pencil point spinal needles were used, and the anaesthetic agent employed to achieve a subarachnoid block was given with 0.5% bupivacaine hydrochloride in 8% glucose monohydrate (bupi heavy, popular pharma) 1.5 - 4ml, The anticipated surgical procedure duration guides the anesthetic volume choice.The blood pressure was measured every 2 minutes during the first 15 minutes after injection of the drug and then every other 5 minutes for the rest of the duration of the anaesthesia while the operation lasted. Also monitored was the height of the block as determined by a pinprick. The patients were confined to bed postoperatively for at least 12 hours and encouraged to take a liberal amount of oral fluids if their conditions permit. The duration of action of the anaesthetic agent was the period between the loss of sensation determined by a needle prick after injection of the agent and regain of power in the lower limb postoperatively. Medicine used for anaesthesia was Bupivacaine heavy 0.2 mg to 0.4 mg /kg body weight or 1.5 to 4ml according to the site of surgery.The intraoperative and postoperative outcome of subarachnoid anaesthesia was carefully documented. Post-spinal headache was considered when the headache was described as being worse or more intense in the upright position and relieved by lying down. Hypotension was defined by a fall in blood pressure of more than or equal to 20mmHg from the baseline and bradycardia when the pulse rate was less than or equal to 65 beats per minute. Hypotension was corrected by increasing the drip rate and intravenous ephedrine and administering oxygen. All data were presented in a suitable table or graph according to their affinity. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for the social science (SPSS) program and Windows.

III. RESULT

A total of 112 patients were analyzed in this prospective study. Almost 50% of patients in the study were from the age group 20-40 years, 40(35.71%) patients were older than 40 years and 17(15.18%) patients were aged less than 20 years (Table 2). Figure 1 shows the gender distribution of the study population; almost 67% of patients were female and 33% of patients were male. Table 3 shows the surgical procedures performed in this study; the majority of the study population was from cesarian section (40.18%), 14(12.50%) patients had a transurethral resection of prostate (TURP). 13(11.61%) patients had an appendicectomy, 11(9.82%) patients had a herniorrhaphy and 6(5.36%) patients had a haemorrhoidectomy and others. There was some complication of the anaesthesia seen in this study, mostly 20(17.86%) patients had nausea, same 17(15.18%) patients had pain at the injection site and chills/shivering, 4(3.57%) patients had vomiting, 3(2.68%) patients had hypotension and only one patient had a spinal headache (Table 4).

Table 1: Age distribution of the study population (N=112).

Age range (Year)	Frequency	Percentage
<20	17	15.18
20-40	55	49.11
40>	40	35.71

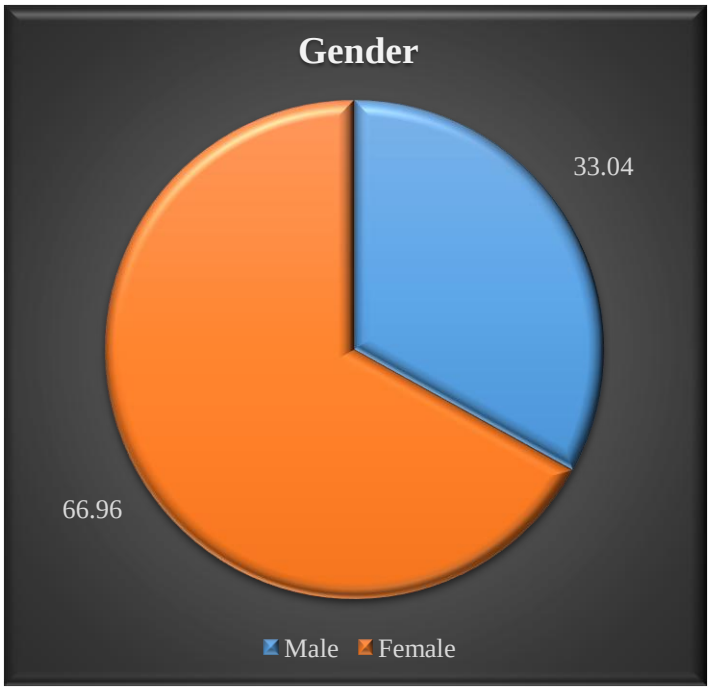

Figure 1: Gender distribution of the study population (N=112).

Table 2: Surgical procedures performed and the number of patients.

Operation	Frequency	Percentage
Caesarian section	45	40.18
TURP	14	12.50
Appendicectomy	13	11.61
Herniorrhaphy	11	9.82
Haemorrhoidectomy	6	5.36
Fissurectomy	5	4.46
Total abdominal hysterectomy	4	3.57
Manchester operation	3	2.68
Myomectomy	2	1.79
Skin grafting	1	0.89
Limb Amputation	1	0.89
Internal fixation of tibial fractures	1	0.89
Operation for varicose vein	1	0.89
Charles's operation for lymphodema	6	5.36
Urethroplasty	6	5.36
Partial cystectomy (cancer bladder	6	5.36
Orchidectomy	6	5.36
Vesicovaginal fistula repair	6	5.36
Laparotomy for ectopic pregnancy	6	5.36
Salpingophorectomy	1	0.89

Table 3: Complications of anaesthesia.

Complications	Frequency	Percentage
Nausea	20	17.86
Pain at the injection site	17	15.18
Chills/Shivering	17	15.18
Spinal headache	1	0.89
Vomiting	4	3.57
Hypotension	3	2.68

IV. DISCUSSION

Augustus Bier performed the first spinal anaesthesia using cocaine in 1889 [24]. Since his first report, regional anaesthesia, including spinal, has gained widespread popularity in the developed world [25]. In Nigeria, particularly in obstetrics, general anaesthesia is the most common form of anaesthesia for major surgical procedures [26]. The factors mitigating the more widespread use of subarachnoid anaesthesia seem to be the frequency and severity of possible occurrence of the complications earlier stated in the text [27]. Nausea, pain at the injection site, and chills/shivering are common occurrences that can easily be content with. However, postspinal headache, hypotension, and vomiting could be potentially dangerous and disabling. The later complications may demand the availability of appropriate equipment and drugs to manage, but they are uncommon, as demonstrated in the present study. Nausea was observed to occur soon after spinal anaesthesia in this study but usually eased off spontaneously. Hypotension, the use of ergometrine to contract the uterus after delivery of the baby, and traction on the peritoneum were conditions that led to vomiting in nauseated patients. Using oxytocin rather than ergometrine to contract the uterus after delivery of the baby, as noted previously, gentle surgery and avoidance of hypotension will ultimately prevent vomiting [28]. The pulse rate and blood pressure did not fall too low in any of our patients after premedication (pulse rate less than or equal to 65 beats per minute, a fall in blood pressure of more than or equal to 20mmHg from the baseline) to demand administration of atropine and a vasopressor drug such as ephedrine respectively. All those who had hypotension were undergoing spinal anaesthesia for cesarean section. The explanation may not be too far from the fact that vascular tone is more dependent upon sympathetic control in pregnant than in the non-pregnant state so that hypotension develops more readily and more markedly consequent to sympathetic blockade following spinal or epidural anaesthesia [29]. Aortocaval compression in pregnant women in the supine position is another contributory factor. Cautious and adequate preloading of the patient using saline through a wide bore needle and right hip wedge to displace the uterus to the left lateral side immediately after the injection of the spinal drug is advised to prevent a severe drop in blood pressure [28,8]. The incidence of postspinal headache was recorded as 0.5% compared to 2.8 per cent noted amongst Africans in a similar study using a size 22G - Spinal needle [25]. The low incidence might be accounted for by the fewer number of patients and also the fact that we used sizes 24-26 Quincke Backok pencil point spinal needle. While different hypotheses have been suggested to explain the pathogenesis of postspinal headaches, the exact cause remains doubtful. However, we still confined our patients to bed for at least 12 hours and longer since they had procedures necessitating prolonged observation and bed rest. Chills/shivering was relieved by keeping the patient warm with a hot water bottle and blanket cover and occasionally warming the intravenous fluids. At the same time, pain at the injection site was treated with oral analgesics. Gentle surgery, sedation, and analgesia would prevent the dull dragging chest pain experienced by some of our patients. The reasons for accepting spinal anaesthesia ranged from the perceived financial benefits, greater patient safety, and earlier maternal-neonatal bonding to the early establishment of breastfeeding. The above reasons are given by our patients and others [27,26,9]. Put forward by countries that have widely adopted this form of anaesthesia would seem to make the use of this technique more desirable. These other reasons included: Reduction in the risk of gastric aspiration and failed tracheal intubation, avoidance of neonatal drug-induced respiratory depression, reduction in operative blood loss, an extension of excellent analgesia into the postoperative period, early mobilization, and return to normal diet [26,8]. There has been a renewed interest and great resurgence in the use of spinal anaesthesia for various surgical procedures [25]. Despite the small sample size and short study period, this study indicates that spinal anaesthesia though safe is not without hazards. Both general and spinal anaesthetic techniques will continue to be used in varying proportions depending on the patient's condition, personnel experience, and facilities' availability. However, a simple technique subjected to less constraint on personnel equipment and drugs would be necessary. This is very important in our environment, where patients are poor, hospital bills are high, and resources available for healthcare are limited.

Limitations of the study: Every hospital-based study has some limitations and the present study undertaken is no exception to this fact. The limitations of the present study are mentioned. Therefore, the results of the present study may not be representative of the whole of the country or the world at large. The number of patients included in the present study was less in comparison to other studies. Because the trial was short, it was difficult to remark on complications and mortality.

V. CONCLUSION AND RECOMMENDATIONS

There has been a renewed interest and great resurgence in the use of spinal anaesthesia for various surgical procedures. 2 Despite the small sample size and short study period, this study indicates that spinal anaesthesia though safe is not without hazards. Both general and spinal anaesthetic techniques will continue to be used in varying proportion depending on patient’s condition, experience of personnel and availability of facilities. However, a technique that is simple and subjected to less constraint on personnel equipment and drugs

would be necessary. This is very important in our environment where patients are poor, hospital bills are high and resources available for healthcare are limited.

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