



Response of unilateral spinal anaesthesia in elderly patients admitted to BMC & Allied Teaching Hospital in District BANNU-KPK.

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Article received on:

25/02/2020

Accepted for publication:

06/07/2020

ABSTRACT... Objectives: The objective of this study was to investigate the possible restriction effects of unilateral spinal anaesthesia on sympathetic block to evade unwanted cardiac effects in elderly patients. **Study Design:** Cross section study. **Setting:** Department of Surgery, BMC Allied Teaching Hospitals District Bannu-KPK. **Period:** June 2018 to January 2020. **Material & Methods:** In this study, 30 ASA III and ASA IV male adults having an age 55-65 and receiving lower limb surgery were included. The patients were given unilateral spinal anaesthesia (using 0.5% Bupivacaine). All the subjects were maintained in a lateral position having their operated side downwards and were kept in position for a period of 15 minutes. The assessment of the sensory and motor nerves was done, and hemodynamic changes were recorded following spinal anaesthesia. The monitoring was done for half an hour. **Results:** The observed hemodynamic effects in elderly patients were minimum which demonstrated the effectiveness of unilateral spinal anaesthesia in limiting the sympathetic block, evading the unwanted cardiac effects thus providing high cardiovascular stability. It was observed that the preparation time required for unilateral spinal anaesthesia was a bit longer as compared to conventional method. The technique also proved to be acceptable for patients with an elevated autonomy following surgical procedure and lesser urine retention. **Conclusion:** When unilateral spinal anaesthesia was administered in admitted patients using lower flow injection method and low volume, stable hemodynamic results were achieved. Patients were more satisfactory. Thus, unilateral spinal anaesthesia is effective in limiting the sympathetic block in old age patients.

Key words: Hemodynamic, Injection Speed, Sympathetic Block, Unilateral Spinal Anaesthesia.

Article Citation: Sibghat Ullah, Begum R, Ahmad W. Response of unilateral spinal anaesthesia in elderly patients admitted to BMC & Allied Teaching Hospital in District BANNU-KPK. Professional Med J 2021; 28(2):187-191.
<https://doi.org/10.29309/TPMJ/2021.28.02.4593>

INTRODUCTION

Unilateral spinal anaesthesia is an anaesthetic technique which is performed rapidly and is cost effective. Because of unavoidable bi-lateral sympathetic block that resulted due to spinal anaesthesia, the cardiac system of the human body is badly affected. Unilateral block results in affecting the sympathetic function on the body's one side. The advantages of one-sided spinal block are more as compared to bi-lateral block. For those with cardiovascular risks, unilateral spinal anaesthesia is suitable due to lack of hypotension.¹ Due to an increased no of out-patients for surgical treatment, surgeons do not consider spinal anaesthesia suitable because of multiple reasons including post-op urinary retention, intra-op hypotension and most

importantly, protracted post-op hospital stay. In unilateral spinal anaesthesia, motor functions restore quickly, lower degree of urinary retention and earlier discharge from hospital. The success of the technique is dependent on many factors including dosage and concentration of the anaesthetic agent, spinal needle shape, speed of the injection, patient's posture during and after injection etc.

Researchers have made serious efforts to explore the reasons and cardiovascular effects of spinal blockage (cardiovascular origin). More than 30% of patients are suffered from hypotension due to spinal anaesthesia.^{2,3} To limit the sympathetic block due to conventional spinal anaesthesia is not possible at all. This sympathetic block

surpasses the sensory block by 2-6 parts.⁴ A report demonstrated that as a result of conventional spinal anaesthesia, a decrease of 21% is observed in mean arterial blood pressure.⁵ More or less 3.7% increase of heartbeat is also observed as a result of anaesthesia to T5.⁶ An increased bradycardia is reported when conventional spinal anaesthesia is administered to patients and this is because of its effects on dermatomes T1-T4 from where cardiac accelerator fibres are generated. Another effective technique is recommended by researchers to limit the unwanted sympathetic block. This alternative technique is known as unilateral spinal anaesthesia.⁷ The term is used when the block is associated only with operated side and its absence is observed at non-operated side. The cardiovascular side effects are reported to be lower when the surgery is performed at lower limb. The block remains advantageous and it facilitates the patient's earlier discharge as well.

The objective of this study was to assess the possible response and effectiveness of unilateral spinal anaesthesia in elderly patients admitted in BMC allied teaching hospitals.

MATERIAL & METHODS

This study was conducted in BMC allied teaching hospitals in district Bannu from June 2018 to January 2020. Non-probability sampling technique (purposive sampling) was used for sampling. The study was carried out on 30 male adults that were decided for unilateral lower limb surgical treatment. The patients were ASA III and ASA IV (ASA III: patients having severe systematic disease that might or might not be associated for surgical procedure, ASA IV: patient with life threatening systematic disease including CAD etc.). All those patients that were contraindicated for local anaesthesia were excluded from the study. The ethical approval to conduct the study was granted by the ethical committee of Bannu medical college and allied hospitals, Bannu-KPK. The consent of all the patients was obtained prior to surgical treatment on a paper. The admitted patients were maintained NPO by mid night. No medicine was administered to the patients before the surgical treatment. All the patients were observed for any possible ischemic change, blood

pressure, heartbeat and for oxygen overload. Prior to initiation of spinal blockage, IV canula was administered into the patients. The patients were placed on table in a lateral position with lower limb down. Figure-1 shows the position at which the patients were maintained. The lumbar area was made aseptic and covered. L2-L3 or L3-L4 space was located and spinal anaesthesia was administered to the patients using a sprotte needle (25 G).

Hyperbaric bupivacaine (0.5%) was injected within 20 seconds followed by intrathecal placement confirmation. Bupivacaine dose adjustment was done in accordance with the patient's height (1.1 ml for patients having height < 150cm, 1.5 ml for those having a height range between 150-175 and 1.8 ml for patients more than 175cm). The lateral position of the patients was maintained for approximately 10min with surgical limb down. Following spinal anaesthesia, sensory block was monitored at every 5min interval for half an hour. This was done using ice boxes. Similarly, lower limb's motor block was also measured in the same way using bromage scale. The patients were advised and monitored for rising the extended legs, flexing the knee, flexing the ankle etc with a rating 0-4 (0=No paralysis, 1= extended leg rising inability, 2= flexing knee inability, 3= inability of dorsiflexion of feet with jiggle toes, 4= movement inability at all). The assessment of heart rate and blood pressure was done before, after and every 5min during half an hr time period of spinal anaesthesia. The patients were sedate with midazolam IV injection at a dose 1-2mg. the total time taken for surgical procedure and any possible complications was monitored and noted. The patients were shifted to rooms after the operation. Upon stabilizing the hemodynamic status of the patients and their physical ability to walk, they were discharged from the hospital/ clinic.

The ethical approval for this study was taken from the "Institutional Ethics Committee" through letter no BMC/0022/2020.

The data was analysed using statistical programme SPSS. ANOVA was run for analysing heart rate, systolic and diastolic blood pressure

individually. A p -value <0.05 was considered as significant.

RESULTS

Demographic data of the patients is shown in Table-1 below. A total of 30 adult male were selected for the study with ASAIII and IV. Their mean age was 61years and the average time of surgery was 50minutes. Of total 30 patients, 20 were ASAIII and 10 were ASAIV patients.



Figure-1. Lateral position for unilateral spinal anaesthesia

Parameters	Mean (\pm SD)	P-Value
Age (in years)	61.55 \pm 4.50	0.280
Weight (in Kg)	60.40 \pm 6.50	0.218
Height (in cm)	160.25 \pm 4.45	0.268
ASAIII	20 (66.66%)	0.460
ASAIV	10 (33.33%)	0.522

Table-1. Demographic data of the patients

Results of haemodynamic variables, sensory block and motor block assessment are explained in the following.

Haemodynamic Variable

It was noted that systolic blood pressure was dropped from the base line just after spinal anaesthesia. The drop was observed after 5min of spinal anaesthesia. After this drop, no momentous alteration in the blood pressure was observed until half an hr. the results are shown in Figure-2 below.

The diastolic blood pressure was dropped remarkably from the base line at 5min following that, there was no remarkable decline until half an hr. The results are shown in Figure-3 below.

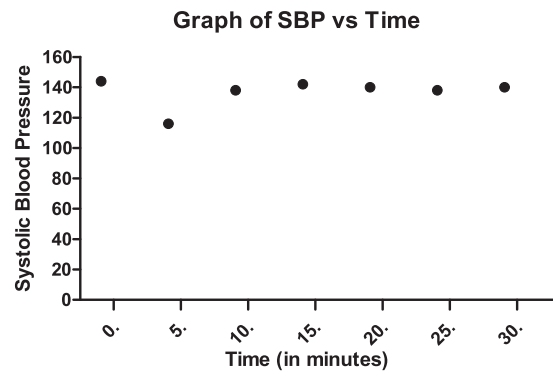


Figure-2. Change in systolic blood pressure with Time

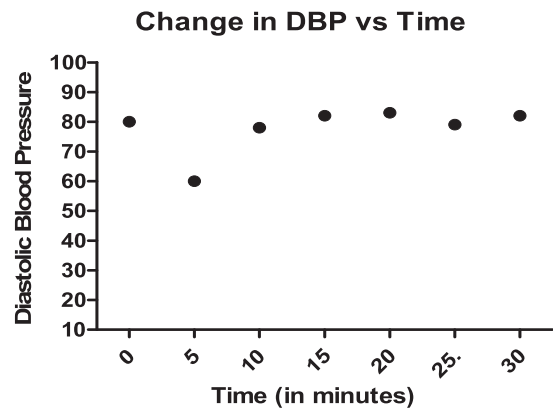


Figure-3: Change in diastolic blood pressure with time

No statistical remarkable alteration was observed in heart rate until 15min followed by spinal blockage. The heart rate was dropped from base line after 20min and no further drop was observed until half an hr next. The results are shown in figure 4 below.

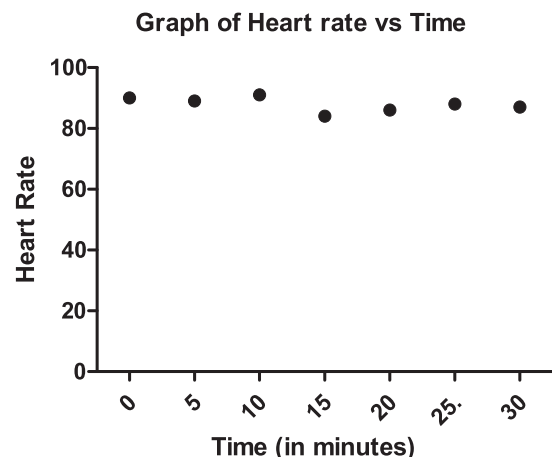


Figure-4. Change in heart rate with time

Transient bradycardia (less than 55beats/min) was observed only in two patients. The hypotension of 3 patients was rectified with 200mg Phenylephrine.

Sensory Blockage

The findings of the study revealed an elevated sensory level for the surgically operated limb at 10min followed by no remarkable alteration until half an hr. The blockage was augmented at 5 and 15min for non-operated limb. No further increase was observed after this time period.

Motor Blockage

At 5min, the severity of paralysis for operated leg was 2.2 than non-operated leg on bromo scale. However, at a time more than 5min, the severity of operated leg was 86.0 time greater than non-operated one. This shows the initial blockage of both legs but following 5min time, non-operated leg motor nerves were no more blocked.

DISCUSSION

Conventional spinal anaesthesia results in PAH (precipitous arterial hypotension) because of higher sympathetic blockage which remains a common problem. The condition is more common with elderly patients. Reports are there which shows that in anaesthesia practice, the reduced injected quantity and more concentrated local anaesthetic hyperbaric solution cannot be produce block absolutely. In our clinical practice, we are using unilateral spinal anaesthesia in a reduced quantity. We are not using the increased concentration of the drug. This resulted in undesirable effects avoidance. Our results showed that the use of 0.5% hyperbaric bupivacaine solution in reduced amount for unilateral spinal anaesthesia, the sympathetic blockage is restricted effectively. This results in prevention of the hemodynamic effects that are undesirable in elderly patients.⁷⁻⁹ Our study showed a correlation of ice boxes with the function of C fibers.¹⁰ The study showed an achievement in sensory loss in operated limb which was found to be higher than non-operated limb. The loss of sensation was found in non-operated limb in a lower level.

It is obvious from this study that even when using a small volume of the drug, we cannot evade some spill over effects on the non-operative limb, though hyperbaric local anaesthetic solution in abridged quantity, bounds the spread of drug to the non-operated side. The clinical relevance of these motor and sensory level alters on non-operated limb may be questioned. Haemodynamic alterations assessed in our patients were very minor and could be overlooked, as these alterations happened in the initial 5 min, later on patient continued to be stable haemodynamically. Numerous reports^{11,15} have exposed the practicality of unilateral block in ASA I and II patients, however in our study, only elderly patients were involved. The expected small hemodynamic alterations in unilateral blockage might be more pertinent in elderly and chronically ill patients and additional controlled studies should be done to assess the practicality of unilateral spinal anaesthesia in elderly patients.

CONCLUSION

Unilateral spinal anaesthesia is effective in limiting the sympathetic block with cardiac stability in elderly patients. When unilateral spinal anaesthesia is administered in admitted patients using lower flow injection method and low volume, stable hemodynamic results are achieved. Patients satisfaction is more as compared to ordinary method. Greater recovery is also achieved in this case.

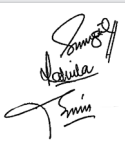
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