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ORIGINAL ARTICLE

Comparison between spinal, combined spinal-epidural and continuous spinal anaesthesia for hip surgeries in elderly patients

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ABSTRACT:
Background: This study was conducted to assess the Comparison between spinal, combined spinal-epidural and continuous spinal anaesthesia for hip surgeries in elderly patients. **Material and methods**: Over a 4-year period, the anaesthetic records of three groups of 100 patients were analysed: those who received spinal anaesthesia alone (Group 1), those who had a combination spinal-epidural block (Group 2), and those who received continuous spinal anaesthesia (Group 3). All blockades were done with the patient lying on their left side. Success of the puncture, deepest level of analgesia achieved, lower limb motor block, quality of anaesthesia, need for additional doses, incidence of failures, paraesthesia, post-dural puncture headache, cardiovascular abnormalities, mental disorientation and delirium, blood transfusion, and death were all factors taken into account. **Results**: The average bupivacaine dose in group 1 was 18.69 mg, in group 2 it was 27.41 mg, and in group 3 it was 9.48 mg. Comparing groups 1 and 3, group 2 patients were noticeably shorter. The cephalad dispersion of patients under continuous spinal vs those under mixed spinal-epidural anaesthesia differed significantly ($p< 0.01$) across groups 1, 2, and 3. Arterial hypotension, bradycardia, paraesthesia, and the need for a blood transfusion were not significantly different between the two groups. Fourteen individuals experienced postoperative mental disorientation. The risk of death during the first postoperative week or month was the same. **Conclusion**: There exists a correlation between the use of regional anaesthetic procedures and a reduced risk of complications during the first postoperative month.
Keywords: anaesthesia, orthopaedic, surgery.

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INTRODUCTION

Spinal anaesthesia involves the use of small amounts of local anaesthetic injected into the subarachnoid space to produce a reversible loss of sensation and motor function. The injection of local anaesthetic in the subarachnoid space can result in hemodynamic and respiratory changes. If it were possible to limit anaesthesia for the surgical field certain undesirable effects of spinal anaesthesia could be avoided.

The first description of the use of segmental anaesthesia was performed by Jonnesco 1909,[1] each attempting to restrict the extent of somatic and sympathetic paralysis to the operative site. Among such techniques are fractional segmental spinal analgesia,[2-5] where localization is achieved by intermittent injection of small amounts of agents into the subarachnoid space via an indwelling catheter or needle, and unilateral spinal analgesia,[6-8] where anaesthesia is confined to one side of the body by the subarachnoid administration of hypobaric or hyperbaric solutions with the patient placed in the lateral position. In 1961, Tanasichuk et al.[9] described a particular technique of spinal anaesthesia in patients receiving one limb orthopaedic surgery, which they named spinal hemi-analgesia. In practice, a conventional unilateral spinal anaesthesia technique can only result in a motor hemi-block and a sensory block preferential to one side.This study was conducted to assess the Comparison between spinal, combined spinal-epidural and continuous spinal anaesthesias for hip surgeries in elderly patients.

MATERIAL AND METHODS

Over a 4-year period, the anaesthetic records of three groups of 100 patients were analysed: those who received spinal anaesthesia alone (Group 1), those who had a combination spinal-epidural block (Group 2), and those who received continuous spinal anaesthesia (Group 3). All blockades were done with the patient lying on their left side. Success of the puncture, deepest level of analgesia achieved, lower limb motor block, quality of anaesthesia, need for additional doses, incidence of failures, paraesthesia, post-dural puncture headache, cardiovascular abnormalities, mental disorientation and delirium, blood transfusion, and death were all factors taken into account.

RESULTS

Table 1: Gender-wise distribution of subjects.

Gender	Number of subjects
Males	50
Females	50
Total	100

Out of 100 subjects, 50 were males and 50 were females.

Table 2: Average dose of bupivacaine in the 3 groups.

Groups	Average dose of bupivacaine (mg)
Group 1	18.69
Group 2	27.41
Group 3	09.48

The average bupivacaine dose in group 1 was 18.69 mg, in group 2 it was 27.41 mg, and in group 3 it was 9.48 mg. Comparing groups 1 and 3, group 2 patients were noticeably shorter. The cephalad dispersion of patients under continuous spinal vs those under mixed spinal-epidural anaesthesia differed significantly ($p< 0.01$) across groups 1, 2, and 3. Arterial hypotension, bradycardia, paraesthesia, and the need for a blood transfusion were not significantly different between the two groups. Fourteen individuals experienced postoperative mental disorientation.

DISCUSSION

In principle, the combination of two different administration of anaesthesia routes on the same patient improves effectiveness and reduces side effects.[10] Spinal anaesthesia provides fast and reliable segmental anaesthesia with minimal risk for toxicity, while epidural anaesthesia provides perioperative anaesthesia (alone or in combination with general anaesthesia), followed by excellent analgesia in the postoperative period.[11,12] Moreover, Combined Spinal Epidural (CSE) anaesthesia reduces the potential for problems, such as the somewhat unpredictable level of blockade after spinal anaesthesia, and the problems of missed segments, incomplete motor block, poor sacral spread and local anaesthetic toxicity that can occur with epidural anaesthesia.

Continuous spinal anaesthesia (CSA) is an underutilized technique in modern anaesthesia practice. Compared with other techniques of neuraxial anaesthesia, CSA allows incremental dosing of an intrathecal local anaesthetic for an indefinite duration, whereas traditional single-shot spinal anaesthesia usually involves larger doses, a finite, unpredictable duration, and greater potential for detrimental hemodynamic effects including hypotension, and epidural anaesthesia via a catheter may produce lesser motor block and suboptimal anaesthesia in sacral nerve root distributions.[13]

Hence, this study was conducted to assess the Comparison between spinal, combined spinal-epidural and continuous spinal anaesthesiafor hip surgeries in elderly patients.

In this study, out of 100 subjects, 50 were men and 50 were women. The average bupivacaine dose in group 1 was 18.69 mg, in group 2 it was 27.41 mg, and in group 3 it was 9.48 mg. Comparing groups 1 and 3, group 2 patients were noticeably shorter. The cephalad dispersion of patients under continuous spinal vs those under mixed spinal-epidural anaesthesia differed significantly ($p< 0.01$) across groups 1, 2, and 3. Arterial hypotension, bradycardia, paraesthesia, and the need for a blood transfusion were not significantly different between the two groups. Fourteen individuals experienced postoperative mental disorientation. The risk of death during the first postoperative week or month was the same.

Minville V et al[14] compared the hemodynamic effect of continuous spinal anaesthesia (CSA) and small dose single injection spinal anaesthesia (SA) regarding the incidence of hypotension. Seventy-four patients aged >75 years undergoing surgical repair of hip fracture were randomized into 2 groups of 37 patients each. Group CSA received a continuous spinal anaesthetic with a titration of 2.5 mg boluses every 15 min of isobaric bupivacaine, while group SA received a single injection spinal anaesthetic with 7.5 mg of isobaric bupivacaine. The overall variations in non-invasive automated arterial blood pressure were not statistically significantly different in the 2 groups at baseline and after CSA or SA (not significant). In the SA group, 68% of patients experienced at least one episode of hypotension (decrease in systolic arterial blood pressure greater than 20% of baseline value) versus 31% of patients in the CSA group ($P = 0.005$). In the SA group, 51% of patients experienced at least one episode of severe hypotension (decrease in systolic arterial blood pressure more than 30% of baseline value) versus 8% of patients in the CSA group ($P < 0.0001$). In the CSA group, 4.5 +/- 2 mg of ephedrine was injected versus 11 +/- 2 mg in the SA group ($P = 0.005$). In the CSA group, 5 mg (2.5-10) of anaesthetic solution was required versus 7.5 mg in the SA group ($P < 0.0001$). They concluded that, in elderly patients undergoing hip fracture repair, CSA provided fewer episodes of hypotension and severe hypotension compared with a single intrathecal injection of 7.5 mg bupivacaine.

CONCLUSION

Present analysis found a correlation between the use of regional anaesthetic procedures and a reduced risk of complications during the first postoperative month.

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