



COMPARATIVE STUDY OF COMBINED SPINAL EPIDURAL ANESTHESIA VS GENERAL ANESTHESIA IN LOWER LUMBER SPINE SURGERY.

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INTRODUCTION

Either under general anesthesia or combined spinal ,epidural anesthesia lumbar spine surgery can be safely and successfully performed.However general anesthesia is commonly and widely used because of its faster onset of action.The advantages of using general anesthesia are patients comfort,satisfaction and the ability to carry out prolonged operations in the prone position without airway compromise.(1,2).

On the other hand, the decrease in intraoperative blood loss and consequently improving operating conditions,(3)the decrease in perioperative cardiac ischemic incidents,postoperative hypoxic episodes,arterial and venous thrombosis,and to provide proper postoperative pain control (4,7)are the important advantages of spinal , epidural anesthesia.With regional anesthesia it is possible that patients can position themselves.

As shown by Scott et al (8),pulmonary complication were frequent in the cases of general anesthesia,whereas comparatively less in the cases of regional anesthesia.According to two retrospective studies,for the patients of lumbar spine surgeries,combined spinal and epidural anesthesia had better impact than general anesthesia.(9,10).

Some of the basic characteristics namely reversal of effects and rapid onset should be the characteristics of a highly acceptable anesthetic technique.During ongoing operation it must maintain stable hemodynamic without any need to increase blood transfusion.In conclusion,very good anesthetic must lower recovery room stay while reducing postoperative pain,nausea,vomiting and additional requirements for analgesics.

On the contrary,as shown by Sadrolsadat et al(11)for patients undergoing lumbar spine surgery,regional anesthesia had no advantages over general anesthesia.In fact,it was shown that combined spinal and epidural anesthesia had more adverse effects compared with general anesthesia.Before final conclusion elucidated, their main was to continue further study on it.

But in clinical experience,patients of lumbar spine surgery have more satisfaction in regional anesthesia rather they face some negative effects in case of general anesthesia. Most of the previous studies conflicted with the study of Sadrolsadat et al.For the important evaluation of both intraoperative and postoperative outcomes after general anesthesia or regional anesthesia during lumbar spine surgery,we performed present study.

METHODS:

Total forty patients of age group 15 years to 70 years who were scheduled for laminectomy, discectomy with fixation, were sorted out.Those patients were kept out who had the history of intracranial hypertension, several spinal stenosis , inadvertent production of high spinal, myelographic demonstration of arachnoiditis, contradiction for spinal anesthesia (such as patients refusal, infection at needling site, hypovolemia, coagulopathy),drug or alcohol abuse.During surgical procedure, if any patient had any physiological changes or if any patient faced huge bleeding during operation, they were also precluded from the study.Written informed consent was handed over to suitable candidates.

The techniques used for our study are accepted methods universally.Our study as carried out in hospital dated from July 2018 to Jun 2021 .The sample size of the study was evaluated based on a calculation which exhibited that at least 20 patients per group were needed to achieve 80% power to reveal a 20 % difference between two groups in the VAS resulting with equal to

- All those surgery techniques were performed by the same surgeon.The eligible patients were grouped into two groups i.e.general anesthesia group and combined spine & epidural anesthesia group with twenty patients in each group sequentially.

In general anesthesia group premedications given are glycopyrrolate injection 0.004mg/kg,ondansetron 0.08mg/kg.Anesthesia was given with ,Propofol (2mg/ kg),and Fentanyl (1.5 µg/kg).Aracurium (0.6 mg/ kg) was given with endotracheal intubation.General anesthesia was carried out with the help of Nitrous oxide 50% in oxygen and 1.2% Isoflurane.For intraoperative analgesia paracetamol infusion administered 15mg / kg was administered. Afterwards, those patients were set down with arms on the arm boards, and they were comfortably flexed 90 degrees at elbows.The faces were also placed on a smooth support to prevent the pressure on nose and globe of the eyes.At intervals of every 15 minutes the heart rate, systolic, diastolic, oxygen saturation and mean arterial blood pressure were observed during the ongoing surgery procedure with the help of ECG,pulse oximetry and noninvasive blood pressure monitoring.if there is bradycardia during surgery inj atropine 0.6 mg applied and in case of hypotension when MAP <65mmHg inj mephentermine 6 mg applied.When the patients were able to get 100% oxygen after finishing the operation techniques,those anesthetic drugs were allowed to cease.With the usage of Neostigmine 0.05 mg/kg and glycopyrrolate0.2 mg for every 1 mg of neostigmine used., neuromuscular blockade was switched subsequently.Later on, the extubation of trachea was done and the patients were referred to the postanesthesia care unit.In this case, the patients who had pulse oximeter oxygen saturation level more than 95%,impromptu respiration end tidal carbon di oxide 35-40 mmHg,respiratory rate less than 30per/minute and tidal volume more than 5 ml/kg were transferred.

For combined spinal epidural anesthesia first patients were prehydrated with ringer lactate solution.tuohy needle was inserted at L 2-3 interspace,after proper local anesthesia and antiseptic dressing draping.Loss of resistance technique is used.A test dose of 3ml lignocaine with adrenaline 2% is given to detect any subarachnoid or intravascular injection.after that epidural catheter was fixed,then spinal anesthesia is given at L3-4 level with 2-3 ml of bupivacaine .5%+ dextrose 8%.for maintenance of epidural anesthesia 4 ml 0.5% bupivacaine is repeated every half an hour after 10 ml loading first dose.

During the operational technique,sedation of patients was carried out by a propofol infusion of 25-50µg/kg/min.mephentermine or 0.5 mg atropine was administered if during the surgery procedure, the patients had faced bradycardia (i.e. heart rate less than 60 per minutes), hypotension (systolic blood pressure less than 90 mmHg).Once the surgery was over, the patients were transferred to supine position from prone position and propofol was discontinued. The patients were allowed to transfer to the PACU (post anesthesia care unit).

Soon after the arrival of the patients to the operating room some physical status were recorded such as age,sex,height,weight and ASA. By calculation of the volume of blood suctioned from the surgical field blood loss was observed and recorded.Maximum heart rate and mean arterial blood pressure changes compared to the baseline were noted down.Till 24 hours after completion of the surgery,total administered dosage of meperidine and analgesic use were also taken down.Incidence of nausea was also recorded.If nausea lasted more than 10 minutes,intravenous ondansetron at 0.8 mg/kg was administered to the patients.0.4mg/kg meperidine was given intravenously if visual analog scale showed the score more than 40mm.If the score did not decrease further 0.2 mg/kg was administered and the total consumption of meperidine was noted down.

The satisfaction level of the patients and surgeon was assessed as a factor.Total time span of surgery procedure starting from beginning to the wound closure and total time span of recovery were also observed and recorded.

In the case of general anesthesia group,if the patients had no pain,nausea,vomiting or hemodynamic instability and most importantly if the patients were fully awake they were released from PACU. In the case of combined spinal and epidural anesthesia group,if the patients faced no pain,vomiting,nausea and at least two segment regression of spinal block,they were discharged from the PACU. Age,height,weight,heart rate changes,time span of surgery,maximum blood pressure, blood loss,time span of recovery were compared between the patients of these two groups.Data were shown as mean,median, $\pm$ SD or number (percent).ASA, physical status,both patients and surgeon satisfaction level,complication rates,post operative analgesic uses,sex were evaluated by performing Fishers exact test or by Pearson chi-square test if needed.All statistical analyses were performed using SPSS ver.16.0. p value < 0.05 was regarded as the statistically significant.

RESULTS

Here was no significant difference between two groups in demographic characteristics,mean duration of surgery(p value <0.39), maximum heart rate changes during surgery(p value<0.19).

there is higher both surgeon(p value<0.03) & patient satisfaction(p value<0.03) in CSE group.

post operative nausea is higher in GA group(p value <0.001).

CSE group has lesser duration of recovery room stay(p value<0.001),maximum mean arterial blood pressure(MAP){p value<0.0001} AND mean blood loss (p value<0.0001).

GA group needs EARLY postoperative analgesia(p value<0.001) and more number of doses (p value<0.001) than CSE group.

DISCUSSION

For lower spine surgery general anesthesia and combined spinal and epidural anesthesia have been done.To find out which procedure was better in lowering peri-operative complications limited randomized controlled prospective investigations have been conducted.

One study performed by McLain et al (12) showed that both of these types of anesthesia procedures were similar effective.According to that study spinal and epidural anesthesia resulted comparatively shorter time span of anesthesia,incidence of nausea and analgesic needs were minimum along with fewer negative effects.In fact, their study included that this regional anesthesia had no extra advantages over general anesthesia as previously mentioned by Sadrosadat et al (11).Though they wanted their results to get verified further.

Tetzlaff et al (13) also performed lumbar spine surgeries with the help of both general anesthesia and regional anesthesia. Their study showed that spinal and epidural anesthesia can be used as the alternative to GA. They observed that spinal and regional anesthesia had lower incidence of minor complications.They also wanted their study to get verified after some trials.

However, modern surgeons prefer combined spinal and epidural anesthesia over general anesthesia.As depicted by them, this regional anesthesia decreased blood loss,heart rate changes, maximum blood pressure and postoperative analgesic use.Along with surgeon satisfaction rate of patients satisfaction is also high in CSE.All procedures were carried out by single surgeon.

It has been shown by some previous studies that CSE decreased loss of blood for orthopaedic surgeries as compared to GA.(14,17).As compared to general anesthesia blood loss was decreased in combined spinal and epidural anesthesia for lumbar spine surgery(18).Our study also showed the same result.Two mechanisms help in blood loss in CSE.Vasodilatation and hypotension caused by sympathetic blockade was one of those mechanisms.(19).Under combined spinal and epidural anesthesia patients do not need to be kept in continuous ventilation that results in lower intrathoracic pressure and less distension of epidural veins.this one is another mechanism .(19).It is also revealed that CSE prevents increase in stress hormones better than GA.(20-25).Maximum intraoperative mean arterial blood pressure and heart rate changes over the basal value were less in group CSE.

Hassi et al (10) showed that in spinal anesthesia patients satisfaction was high as there were low complications.They basically emphasized on general patient satisfaction with spinal anesthesia.In decreasing pain this kind of regional anesthesia played a good role.

One of those two mechanisms that can explain decreasing postoperative analgesic use in spinal and epidural anesthesia is the preemptive effect of this anesthesia which lowers pain by prohibiting afferent nociceptive sensitization pathway.(18).Existence of some residual sensory blockade in CSE group might be the second mechanism.

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