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Comparison between Combination of Spinal and General Anesthesia with Plain General Anesthesia in Patients Undergoing Laparoscopic Gynaecological Surgeries

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Abstract

Aim and Objective: *The present study was undertaken to compare the combination of spinal (SA) and general anesthesia (GA) with plain general anesthesia (GA) in terms of heamodynamic parameters, requirement of rescue analgesia and incidence of post–operative nausea and vomiting (PONV).*

Methods: *In this study, 100 female patients of ASA grade I or II, having age between 20 to 60 years were randomly divided into two groups of 50 patients in each group. Group A received GA and group B received SA with GA. In group A induction of anaesthesia was done with propofol 2mg/kg and vecuronium bromide 0.1mg/kg while in group B induction was done with 15-18 mg of heavy bupivacaine hydrochloride. In both the groups, heamodynamic parameters (HR, SBP and DBP) and SPO2 were recorded and requirement of rescue analgesia were noted. Patients were monitored for any evidence of complications or adverse events.*

Results: *The heamodynamic parameters and VAS values were relatively lower in group B than group A and difference was found to be statistically significant ($p< 0.05$). Hence, the requirement of rescue analgesia was less in group B than group A. Group A had 70% of patients with PONV as compared to 28% in group B.*

Conclusions: *The combination of spinal and general anesthesia provided more stable hemodynamic profile with better postoperative pain control and less PONV in patients undergoing laparoscopic gynaecological surgeries.*

Keywords: *Spinal anesthesia, General anesthesia, Heamodynamics, Propofol, Vecuronium bromide, Bupivacaine hydrochloride.*

Introduction

The introduction of laparoscopy in field of surgeries in the mid 1950s revolutionized surgical techniques due to reduction in overall morbidity related to surgery like reduced hospital stay, early recovery, less surgical complications like reduced bleeding, other surgical complications, reduced overall cost and post operative complications[1]. The various effects of induction of pneumoperitoneum, an integral part of laparoscopy, can result in respiratory embarrassment, cardiovascular changes and neurologic alterations[2]. The

cardiovascular effects are mainly dependent on the intra abdominal pressure and the absorption of carbon dioxide into systemic circulation. At lower abdominal pressure of less than 15 mmhg, venous return is augmented due to emptying of splanching vessels and thus cardiac output and blood pressure are increased. At higher intra abdominal pressures of more than 15 mmhg due to compression of inferior vena cava and other collaterals, venous return is decreased thus reducing cardiac output and blood pressure[3,4].

Laparoscopic surgeries are performed under both spinal anaesthesia (SA) and general anaesthesia (GA) by convention GA remains mainstay for all kinds of laparoscopic surgeries, however unuopposed increase in systemic vascular resistance associated with pneumoperitoneum has to be managed by increasing anaesthetic comcentrations at times administering vasodilators[5]. This eventually leads to unnecessary deepening of anaesthesia, delayed awakening, do not prove cost effective. While spinal anaesthesia alone can counteract the increased SVR[6]. However with prolonged pnuemoperitoneum time, patients discomfort becomes the limiting factor[7]. So combine SA and GA decreases need for sedatives, opiods, vasodilators, decreases stretch pain, decreased stress hormone response, improved bowel motility, postoperative analgesia, and early mobility.

Concomitant use of two techniques for better heamodynamic stability is widely accepted method[8] and it has been studied previously by many authors for laparoscopic cholecystectomy. Present study was designed to compare the combination of SA and GA with plain GA in patients undergoing laparoscopic gynaecological surgeries such as laparoscopic hysterectomy, laparoscopic tubal recanalisation, tubal ligation etc and to compare heamodynamic parameters, requirement of rescue analgesia and incidence of post –operative nausea and vomiting (PONV).

Material and Methods

After obtaining Institutional Ethical Committee approval and written inform consent from patients, this prospective, randomized, comparative clinical study was conducted in 100 female patients of ASA grade I or II, age between 20 to 60 years for a period of one year. Patients were randomly divided into two groups of 50 patients in each group. The group size was determined by power of analysis based on standard deviation data from a previous study report. Group A received GA and group B received SA with GA.

A detailed pre-anaesthetic evaluation was done to evaluate basal heart rate (HR), blood pressure (BP). On arrival in Operation Theater NBM status was confirmed, baseline electrocardiogram (ECG), heart rate (HR), systemic arterial pressure and peripheral oxygen saturation (SPO2) were recorded. After securing intravenous line with no.18 G cannula, all patients were preloaded with 10-15 ml / kg of ringer lactate.

Group A patients were pre-medicated with ondensetron 4 mg, ranitidine 50 mg, glycopyrolate 0.2 mg, Midazolam 0.05 mg /kg and fentanyl 2 mcg /kg intravenously. Induction of anaesthesia was done with propofol 2mg/kg and vecuronium bromide 0.1mg/kg. Intubation was done with appropriate sized ET no.7/ ET no.7.5. Anaesthesia was maintained with 40% oxygen and 60% nitous oxide, isoflurane and vecuronium bromide 0.05mg/kg which was repeated every 20 minutes thereafter. At the end of surgery residual neuromuscular block was reversed by appropriate dose of neostigmine 0.05mg/kg and glycopyrolate 0.01 mg/kg intravenously. Group B patients were pre-medicated with same protocols followed by spinal anaesthesia with patient in left lateral position, under all aseptic precautions lumbar puncture done with 26G disposable Quinke type of spinal needle at L3-L4 spinal intervertebral space, free and clear flow of CSF confirmed, 15-18 mg of heavy bupivacaine hydrochloride was injected intrathecally. Level sensory blockade up

to T4 was achieved. After that GA was given as in group A.

In both the groups, systolic blood pressure (SBP) and diastolic blood pressure (DBP), heart rate (HR), SPO2 were recorded at following points of time: prior to induction or pre –operative at 1, 2, 5, 10 minutes after intubation in group A and after intubation of SA with GA in group B, immediately after pneumoperitoneum and every 15 minutes thereafter. In the post anaesthesia care unit all patients were monitored for any evidence of complications or adverse events. Patients were enquired about nausea and vomiting, headache, sore throat. Pain was analyzed using visual analog scale (VAS) and assessed at 1, 3, 6, 9, 12 hr. Intensity of pain was assessed by using 10 point VAS representing varying intensity of pain from 0 (no pain) to 10 (worst pain). Rescue analgesic diclofenac sodium 75 mg intramuscular was given when VAS was 6 or more.

Statistical Analysis

The statistical analysis was done by sample "t" test. Chi –square test was done for nonparametric values and corresponding p values was computed using SPSS for windows (statistical presenting system software version 17). $p<0.05$ was considered statistically significant.

Observations and Results

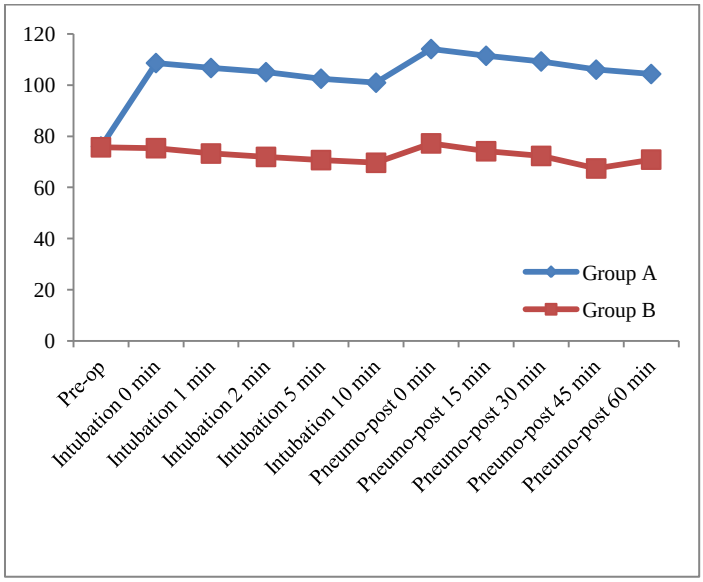
Total 100 female patients were enrolled in the study and divided into group A and group B. The age and weight of the patients were compared between two groups using chi-square test and 2 independent sample t- test respectively, there was no significant difference found with respect to demographic profile of the patients, (Table 1).

Table 1: Demographic profile of patients

Parameters	Group A	Group B	P value
Age (years)	43.2 ± 8.64	43.7 ± 8.21	0.767
Weight (kg)	57.7 ± 5.08	57.46 ± 4.67	0.806

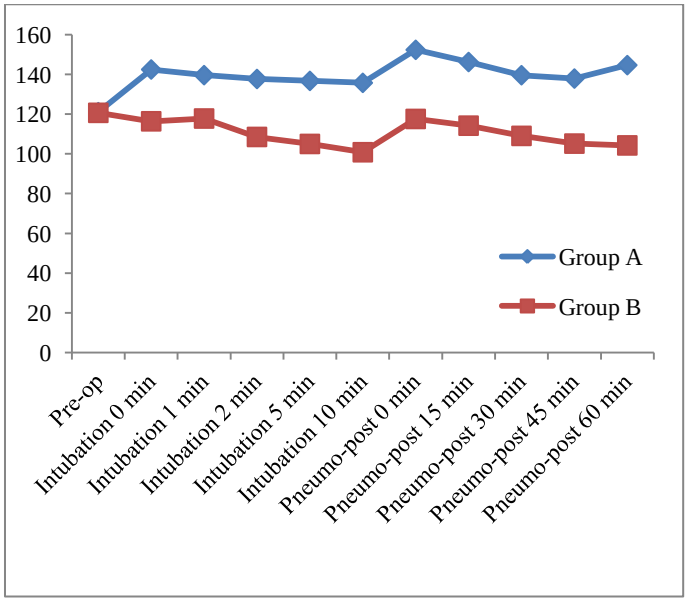
Baseline and intra operative HR values were comparable in both groups at fixed intervals while there was significant difference found in HR values at post anaesthesia intervals. Values were relatively lower in group B and the difference was found to be statistically significant ($p< 0.05$), (Figure 1).

Figure 1: Comparison of changes in Heart Rate between two groups



We found no statistical significant difference in SBP values at baseline. However there was a significant difference in SBP values after anaesthesia at mentioned interval between two groups. SBP values were relatively lower in group B and the difference was found to be statistically significant ($p< 0.05$), (Figure 2).

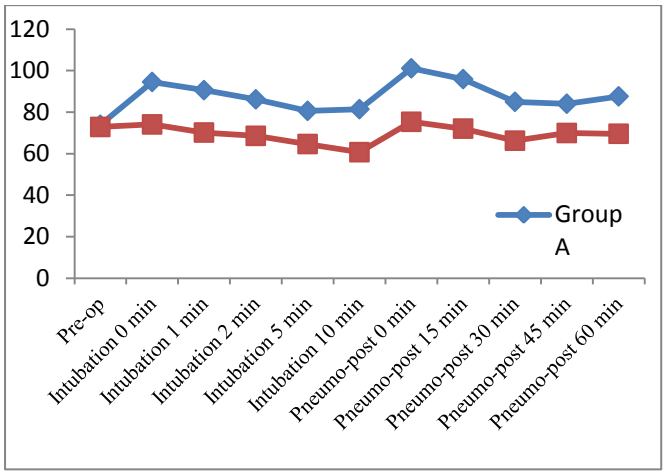
Figure 2: Comparison of changes in SBP between two groups



There was no significant difference in DBP values in post anaesthesia at various intervals between two groups. DBP values were relatively lower in

group B and the difference was found to be statistically significant (p< 0.05), (Figure 3).

Figure 3: Comparison of changes in DBP between two groups



Group A had 70% of patients with PONV as compared to 28% in group B (Table 2). However the incidence was not statistically significant. There was significant difference between the two groups with respect to VAS values during postoperative period until 3 hrs values were lower in group B and the difference was found to be statistically significant (p< 0.05). We also found that there was no statistically significant difference between groups A and B with respect to VAS pain score post operative 9 and 12 hr.

Table 2: Incidence of nausea and vomiting

Groups	Nausea and Vomiting		P value
	Yes	No	
Group A	35 (70%)	15 (30%)	0.000027
Group B	14 (28%)	36 (72%)	
Total	49	51	

Discussion

Laparoscopic procedures have been traditionally performed under GA due to the concerns about Pneumoperitoneum-related respiratory changes associated with it. However, recently the use of regional anesthesia (RA) especially spinal anesthesia has been introduced for these laparoscopic procedures. The evidence suggests the safety of the use of general, spinal and combined spinal and general anaesthesia in laparoscopy with minimal side effects which can easily be managed with the available pharmacological drugs[9]. Combining two anesthesia techniques to add their advantages and limit the side effects of each is not new. Luchetti *et al*. studied the combination of epidural and general anesthesia for laparoscopic cholecystectomy and inferred the combination to be safe and effective[10]. Metabolic response is shown to be reduced by regional anesthesia [11,12]. In relation to combining SA and GA, comparison has been made, with positive results obtained in patients undergoing laparoscopic cholecystectomy[13]. Encouraged by this, we conducted a prospective, randomized, comparative clinical study to compare the combination of spinal (SA) and general anesthesia (GA) with plain general anesthesia (GA) in terms of heamodynamic parameters, requirement of rescue analgesia and incidence of post–operative nausea and vomiting (PONV).

Both these techniques (GA and SA) have proven to be effective anaesthetic methods but are associated with some complications and side-effects[14,15]. SA often results – with hypotension, urinary retention and prolonged motor recovery and that entire can limited its routine use in ambulatory surgery. SA alone is being successfully utilized for short or day care laparoscopic procedures. For major laparoscopic surgeries, however, conventional GA is still the technique of choice[16]. But under GA, the hemodynamic derangements during pneumoperitoneum have to be managed by either increasing the anesthetic concentration or by administering vasodilators[17,18]. The former leads to unnecessary deepening of anesthesia and the latter may cause awareness[19]. When SA was used in conjunction with GA, the sympathectomy resulting from SA may limit the rise in SVR, thus overcoming the increased blood pressure. This finding was confirmed in our study where the hemodynamic parameters in group B was well maintained during pneumoperitoneum, as against in group A and results was consistent with previous study [13].

An interesting finding of our study was the incidence of PONV which is also a major drawback in laparoscopic surgery [20,21]. Thirty

five patients in group A and fourteen patients in group B had PONV. This probably has to be attributed to the anesthetic concentrations, since by using less halogenated agents, consciousness level is recovered more quickly and secondary effects such as PONV diminish. In the post anaesthesia care unit all patients were observed for pain at 1, 3, 6, 9, 12hr. The intensity of pain was more in group A than group B with significant difference until 3 hrs while we found no statistically significant difference between two groups with respect to VAS pain score post operative 9 and 12 hr. In our study, the requirement of rescue analgesic (diclofenac sodium 75 mg) was less in group B as compared to group A.

Conclusion

The present study demonstrated that the combined SA and GA techniques provided better cardiocirculatory stability with better postoperative pain control and less PONV, than plain GA in laparoscopic gynaecological surgeries.

Study suggested that the hemodynamic repercussions during pneumoperitoneum can be effectively attenuated by combining SA with GA without any adverse effects. Also it has a faster recovery from anesthesia and a shorter duration of postoperative pain.

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Reference

1. Jadhav PP, Kamble R, Kolekar AD and Supe AN. Spinal anaesthesia for general laparoscopic surgery. ejbps 2016;3(8):371-375.
2. Gerges FJ, Kanazi GE, Jabbour-Khouri SI. Anesthesia for laparoscopy: A review. J Clin Anesth. 2006;18:67–78.
3. Gutt CN, Oniu T, Mehrabi A, Schemmer P, Kashfi A, Kraus T, *et al*. Circulatory and respiratory complications of carbon dioxide insufflation. Dig Surg 2004;21:95-105.
4. Zuckerman RS, Heneghan S. The duration of hemodynamic depression during laparoscopic cholecystectomy. Surg Endosc 2002;16:1233-6.
5. Jean LJ. Anesthesia for laparoscopic surgery. In: Miller RD, editor Anesthesia, 7th ed. New York: Churchill Livingstone; 2010. p. 2185-202. Sinha R, Gurwara AK, Gupta SC. Laparoscopic surgery using spinal anesthesia. JSLS 2008;12:133-8.
6. Vaghadia H, Viskari D, Mitchell GW. Selective spinal anesthesia for out patient laparoscopy. Can J Anaesth 2001;48:256-60.
7. Rodgers A, Walker N, Schug S, McKee A, Kehlet H, van Zundert A, *et al*. Reduction of post operative mortality and morbidity with epidural and spinal anesthesia: Results from overview of randomized trials. BMJ 2000;321:1493.
8. Vaghadia H, Mc Leod DH, Mitcheel GW. Small dose of hypobaric lidocaine and Fentanyl for outpatients laparoscopy. Anesthesia Analg 1997;85:59.
9. Sukhminder Jit Singh Bajwa and Ashish Kulshrestha. Anaesthesia for laparoscopic surgery: General vs regional anaesthesia. J Minim Access Surg. 2016; 12(1): 4–9.
10. Lehtinen AM, Laatikainen T, Koskimies AI, Hovorka J. Modifying effects of epidural analgesia or general anesthesia on stress hormone response to laparoscopy for in vitro fertilization. J In Vitro Fert Embryo Transf 1987;4:23-9.
11. Rigg JR. Does regional block improve outcome after surgery? Anaesth Intensive Care 1991;19:404-11.

12. Yokoyama M, Ohta Y, Hirakawa M, TSuge H. Hemodynamic changes during laparoscopic cholecystectomy under different anesthesia methods. Masui 1996;45:160-6.
13. O'Malley C, Cunningham AJ. Physiological changes during laparoscopy. Anesthesiol Clin North Am 2001;19:1-19.
14. Korhonena M, Valanne JV, Jokela RM, Ravaska P, Korttila KT. A comparison of selective spinal anesthesia with hyperbaric bupivacaine and general anesthesia with desflurane for outpatient knee arthroscopy. Anesth Analg 2004;99: 1668–73.
15. Hanning CD. Postoperative cognitive dysfunction. Br J Anaesth 2005;95: 82–7.
16. Ghodki PS, Sardesai SP, Naphade RW. Combined spinal and general anesthesia is better than general anesthesia alone for laparoscopic hysterectomy. Saudi J Anaesth 2014;8:498-503.
17. Johannsen G, Anderson M, Juhl B. The effect of general anesthesia on the haemodynamics events during laparoscopy with CO2 on sufflation. Acta Anaesthesiol Scand 1989;33:132.
18. Newton DE. Awareness in anesthesia. In: Atkinson RS, Adam P, Editors, Recent advances in anesthesia and analgesia, No.18. New York; Churchill Livingstone; 1994; 39-58.
19. Wong J, Song D, Blanshard H, Grady D, Chung F. Titration of isoflurane using BIS index improves early recovery of elderly patients undergoing orthopedic surgeries. Can J Anesth 2002;49:13-8.
20. Malins AF, Field JM, Nesling PM, Cooper GM. Nausea and vomiting after Ondansetron, metoclopromide and placebo. Br J Anaesth 1994;72:231-3.
21. Fisburne JI. Anesthesia for laparoscopy: Considerations, complications and techniques. J Reprod Med 1978;21:37-40.