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ORIGINAL ARTICLE

Neuroaxial Verses General Anesthesia for Gynecological Surgeries

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ABSTRACT

Objective: To evaluate the anaesthetic effects, patient satisfaction, and the Oxidative Stress Index between neuroaxial anaesthesia (NA) and general anaesthesia (GA) during gynecologic laparoscopic surgery.

Study Design: Prospective randomized study

Place and Duration: Lady Reading Hospital Peshawar.1st Jan, 2021 to 30 June, 2021.

Methods: The research involved ninety women between the ages of 20 and 55 who were scheduled to undergo diagnostic laparoscopy and hysteroscopy for unexplained infertility and had an ASA I-II physical status.Age, BMI and laparotomy indication were documented after obtaining informed written permission from each patient. Patients were equally divided in two groups group I received neuroaxial anesthesia and group II received general anesthesia. Post-operative outcomes among both groups were compared. SPSS 22.0 was used to analyze complete data.

Results: Mean age of the patients in group I was 33.4±11.32 years and had mean BMI 25.4±7.81 kg/m^2 while in group II mean age was 30.7±14.63 years with mean BMI 22.8±9.52 kg/m^2. In group I 28 (62.2%) cases had ASA class I and in group II 30 (66.7%) cases had ASA class I. Diagnostic laparoscopy was majority in numbers among both groups 29 (64.4%) in group I and 26 (57.8%) in group II. Among both groups paratubal cystectomy was most common symptom found in 6 (13.3%) cases and 7 (15.6%) cases. Mean operative time in neuroaxial group was lower 45.3±6.52 minutes as compared to group II was 54.8±11.42 minutes. Mean time of anesthesia was also lower in group I as compared to group II with p value <0.003. Mean pain score was significantly reduced in group I 3.6±8.61 as compared to group II 6.8±11.92. Heart rate and arterial pressure was lower in group I. Post-operative Oxidative Stress index among patients of group II was higher 1.9±4.45 as compared to group I 0.9±0.42.

Conclusion: We concluded in this study that the use of neuroaxial anesthesia undergoing gynecologica laparoscopy was effective and useful as compared to general anesthesia in terms of less pain score and oxidative stress index. Except this frequency of adverse events were also lower in neuroaxial group.

Keywords: Laparoscopy, Nueroaxial Anesthesia, General Anesthesia, Complication, Pain score

INTRODUCTION

Laparoscopic surgery has replaced open surgery as the preferred method for many types of abdominal and gynaecological procedures because of its reduced risk, improved visibility, and speedy recovery. When it comes to laparoscopy, general anaesthesia is the norm. Covid infection may necessitate the avoidance of intubation, though. It is recommended to use localisedanaesthetic such spinal or peridural anaesthesia if it is feasible, since transmission of Covid to medical staff increases in an emergency scenario [1–2]. Abdominal surgery with a horizontal incision in the lower abdomen is often performed with regional anaesthetic. Cesarean section and hysterectomy are examples of laparotomy in regional anaesthesia and vaginal surgery, respectively. An abdominal incision is the sole option for some types of urgent procedures, such as those for extrauterine pregnancy or appendicitis. Laparoscopic surgery under general anaesthesia has become the de facto norm in many facilities. The pelvic organs are freed for a better view of gynaecological laparoscopic surgery when the patient is in the Trendelenburg posture. [2] The viability of cholecystectomies and pelvic procedures using laparoscopic surgery with regional anaesthesia has been proven. If a patient has COVID-19 and has surgery, general anaesthesia puts them at greater risk for problems related to the virus than regional anaesthetic. Chronic pulmonary failure, myocarditis, arrhythmias, and chronic heart failure were all reported as long-term side effects of COVID-19 (3 months–1 year). Other reported effects included fibrosis of the liver and kidneys, demyelination of nerve fibres, cognitive decline, depression, and schizophrenia. for localisedanaesthetic during the epidemic of COVID-19 American Society of Regional Anesthesia and Pain Medicine and European Society of Regional Anaesthesia and Pain Therapy have produced an initial joint statement [1–2]. For safe regional anaesthesia during the COVID-19 pandemic, this publication presents evidence-based clinical guidelines. The use of regional anaesthesia rather than general anaesthesia is suggested in COVID pandemics when contraindications aren't present. [3]. It has been shown that individuals who get spinal or epidural anaesthesia are less likely to develop postoperative pneumonia than those who receive general anaesthesia [4,5].Neural anaesthesia (NA) is a technique that involves injecting numbing agents into a patient's spinal cord in order to prevent them from feeling pain.[6]

With general anaesthesia, patients are rendered unconscious and so have no awareness of their surroundings, including the sensation of pain. In the last several decades, only the introduction of new medications and treatment options for postoperative pain and nausea and vomiting have seen significant modifications in anaesthetic procedures. [7]

According to predetermined inclusion criteria, a systematic review seeks to collect all empirical data that meets these requirements.[8] In order to help anesthesiologists choose the best anaesthesia strategy for major gynaecological procedures, this systematic analysis of randomised clinical studies attempts to establish the efficacy and safety of neuraxial vs general anaesthesia in major gynaecological surgeries.

MATERIA AND METHODS

This prospective/randomized study was conducted atLady Reading Hospital Peshawar and comprised of 90 females undergoing gynecologic surgery. Age, BMI and laparotomy indication were documented after obtaining informed written permission from each patient.All patients who were less than 20 years of age or more than 55 years of age, who rejected SA, who were cigarette smokers and had a BMI of more than 30 kg/m2 were eliminated from the trial.

Patients were equally divided in two groups group I received neuroaxial anesthesia and group II received general anesthesia.To minimise hypotension owing to spinal obstruction, patients were given hydroxyethyl starch 6 percent (5 mL/kg) and 3 L/kg 100 percent O2 through nasal cannula as part of the NA operation. The

25-G Quincke spinal needle was used for SA in L2-3 once hemodynamic parameters had stabilised. It was injected into the subarachnoid space with the addition of 25 mg of fentanyl, which is 0.5 millilitres of bupivacaine. Prick tests were used to measure the extent of sensory obstruction. Patients were given 1 mg of midazolam intravenously after obtaining sensory blockade at the T4 level. During the procedure, saline was injected at a rate of 5-10 mL/kg/h. Additional fentanyl and midazolam intravenous dosages were given to patients who experienced shoulder or surgical pain, and sedation was further enhanced with additional doses of midazolam intravenously.

Prolonged pre-oxygenation with 100% oxygen through face mask, induction with 2 mg/kg atracurium, 0.5-1 mg/kg of Fentanyl, sevoflurane 2-3 percent, and O2-air mixture 50 percent for the maintenance of sevoflurane and O2-air mixture. Fentanyl (25 g) was injected intravenously into patients who experienced tachycardia, sweating, and high blood pressure because of insufficient surgical analgesia. Sevoflurane 3% + O2-air mixture 50% was discontinued at the final dermal suture. End-of-procedure decurarization included the use of neostigmine 0.06 mg/kg. Patients were extubated in accordance with established standards.

Both groups recorded and managed adverse effects such as tachycardia, bradycardia, hypotension, and elevated blood pressure. Intraoperative symptoms such as nausea/vomiting (N/V), shoulder pain, irritability, and an elevated obstruction level have all been documented.Post-operative outcomes among both groups were compared. SPSS 22.0 was used to analyze complete data.

RESULTS

Mean age of the patients in group I was 33.4±11.32 years and had mean BMI 25.4±7.81 kg/m^2 while in group II mean age was 30.7±14.63 years with mean BMI 22.8±9.52 kg/m^2. In group I 28 (62.2%) cases had ASA class I and in group II 30 (66.7%) cases had ASA class I. Diagnostic laparoscopy was majority in numbers among both groups 29 (64.4%) in group I and 26 (57.8%) in group II. Among both groups paratubal cystectomy was most common symptom found in 6 (13.3%) cases and 7 (15.6%) cases. Mean operative time in neuroaxial group was lower 45.3±6.52 minutes as compared to group II was 54.8±11.42 minutes. Mean time of anesthesia was also lower in group I as compared to group II with p value <0.003.(table 1)

Table-1: Females with baseline details

Variables	NA	GA
Mean age (years)	33.4±11.32	30.7±14.63
Mean BMI (kg/m^2)	25.4±7.81	22.8±9.52
ASA		
I	28 (62.2%)	30 (66.7%)
II	17 (37.8%)	15 (33.3%)
Indication of Surgery		
Operative	16 (35.6%)	19 (42.2%)
Laparoscopy	29 (64.4%)	26 (57.8%)
Symptoms		
Adhesiolysis	4 (8.9%)	2 (4.4%)
Endometriotics foci	2 (4.4%)	3 (6.75)
Paratubal cystectomy	6 (13.3%)	7 (15.6%)
Mean Time of anesthesia (minutes)	45.3±6.52	54.8±11.42
Mean Surgery Time (minutes)	50.7±8.51	59.5±11.42

Table-2: Comparison of heart rate and arterial pressure

Variables	NA	GA
Heart rate (bpm)		
30th min	71.4±5.61	83.8±11.44
60th min	67.8±3.32	75.14±17.32
Arterial pressure (mmHg)		
30th min	79.17±11.32	86.11±6.26
60th min	76.6±5.98	84.5±3.17

There was no significant difference in heart rate between the groups until the 30th minute, when group NA heart rate was lower (p=0.01). Group NA had considerably lower MAP readings at the 30th and 60th minute points in time. When it came to SpO2, there was no discernible difference between the two groups.(Table 2)

Mean pain score was significantly reduced in group I 3.6±8.61 as compared to group II 6.8±11.92. Heart rate and arterial pressure was lower in group I. Post-operative Oxidative Stress index among patients of group II was higher 1.9±4.45 as compared to group I 0.9±0.42.(table 3)

Table-3: Comparison of pain score and OSI after surgery

Variables	NA	GA
Mean pain score	3.6±8.61	6.8±11.92
Mean OSI	0.9±0.42	1.9±4.45

After surgery, frequency of adverse events in group II was higher found in 12 (26.7%) as compared to neuroaxial group in 4 (8.9%) cases.(fig 1)

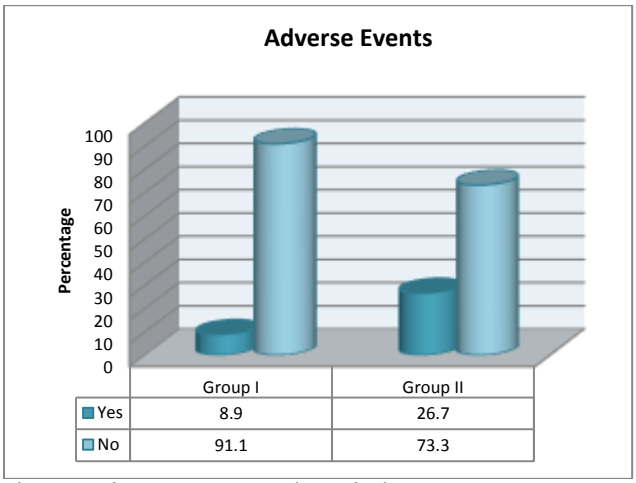

Figure-1: After surgery comparison of adverse events

Post-surgery hospital stay in neuroaxial group was lower as compared to general anesthesia group with p value<0.005.

DISCUSSION

Even though some research suggests that narcotic analgesia (NA) is a viable postoperative pain management strategy, its effect on mortality and surgical morbidity has yet to be determined. [9] It was possible to conclude that neuroaxial anaesthesia was more effective and safer than general anaesthesia for major gynaecological.

In current study 90 females were presented. Age of the patients was between 20-55 years. Forty five patients received neuroaxial anesthesia and other 45 patients received general anesthesia.Mean age of the patients in group I was 33.4±11.32 years and had mean BMI 25.4±7.81 kg/m^2 while in group II mean age was 30.7±14.63 years with mean BMI 22.8±9.52 kg/m^2. In group I 28 (62.2%) cases had ASA class I and in group II 30 (66.7%) cases had ASA class I. Diagnostic laparoscopy was majority in numbers among both groups 29 (64.4%) in group I and 26 (57.8%) in group II. These findings were comparable to the previous studies.[10,11]Among both groups paratubal cystectomy was most common symptom found in 6 (13.3%) cases and 7 (15.6%) cases. Mean operative time in neuroaxial group was lower 45.3±6.52 minutes as compared to group II was 54.8±11.42 minutes. Mean time of anesthesia was also lower in group I as compared to group II with p value <0.003. Previous research presented same findings to our study.[12]

There must be no physiologic or metabolic injury done to the patient, and the anaesthetic procedure must also provide a rapid and safe recovery in the post-operative period. [13] Hence, a procedure with comparable hemodynamic characteristics should be considered advantageous. In terms of hemodynamic measures,

there was no significant difference between groups except for heart rate and MAP at the 30th minute, which were considerably lower in group NA owing to sympathetic blocking in NA. [14]

The use of SA and GA in laparoscopic surgery is contentious when it comes to respiratory characteristics. It has been established that spontaneous physiologic respiration during SA is superior than aided respiration in GA[14]. There were either no or just little changes in respiratory function caused by mid-thoracic spinal anaesthesia in several investigations, and clinically meaningful variations in respiratory function were modest in all of them. [15] The respiratory rate and tidal volume remained constant or hardly changed despite the high degree of SA blockage, and vital capacity declined somewhat. [14] The lungs also recover to normal in around 24 hours after laparoscopic surgeries using general anaesthesia (GA). [16]

In our study mean pain score was significantly reduced in group I 3.6±8.61 as compared to group II 6.8±11.92. Heart rate and arterial pressure was lower in group I. Post-operative Oxidative Stress index among patients of group II was higher 1.9±4.45 as compared to group I 0.9±0.42.[10,11]In two trials, the degree of satisfaction was measured using different measures, and in both cases, there was a statistically significant difference between the groups in terms of their level of satisfaction with pain treatment. [17,18] A meta-analysis is not feasible since all of the studies used different questionnaires to measure the same variable.

After surgery, frequency of adverse events in group II was higher found in 12 (26.7%) as compared to neuroaxial group in 4 (8.9%) cases. In Sinha et al[19] .'s series of 4.645 patients, 2.992 received laparoscopic cholecystectomy, SA was done on all patients, and 846 (18.21%) patients had hypotension. Lower intraperitoneal insufflation pressure (8-10 mm Hg) may have reduced hypotension. In our investigation, high-pressure entrance and a greater intraperitoneal working pressure (12 mm Hg) may have led to more hypotension in the SA group, although this approach is safer. [20] Frequency of intraoperative hypotension is 5.4% to 40%. [21] No intraoperative hypotension needed inotropes. Preoperative colloid administration may be to blame.

Neural anaesthesia for major gynaecological procedures is effective or safe as general anaesthesia, according to the evidence from the previous researches. In our study, we found the same results.

CONCLUSION

We concluded in this study that the use of neuroaxial anesthesia undergoing gynecologica laparoscopy was effective and useful as compared to general anesthesia in terms of less pain score and oxidative stress index. Except this frequency of adverse events were also lower in neuroaxial group.

REFERENCES

1 Uppal, V.; Sondekoppam, R.V.; Lobo, C.; Kolli, S.; Kalagara, H.; Edra, F. Practice recommendations on neuraxial anesthesia and peripheral nerve blocks during the COVID-19 pandemic. In ASRA/ESRA COVID-19 Guidance for Regional Anesthesia; ASRA Society: Gujarat, India, 2020; Volume 31.

2 Uppal, V.; Sondekoppam, R.V.; Landau, R.; El-Boghdadly, K.; Narouze, S.; Kalagara, H.K.P. Neuraxial anaesthesia and peripheral nerve blocks during the COVID-19 pandemic: A literature review and practice recommendations. Anaesthesia 2020, 75, 1350–1363.

3 Cappelleri, G.; Fanelli, A.; Ghisi, D.; Russo, G.; Giorgi, A.; Torrano, V.; Bianco, G.L.; Salomone, S.; Fumagalli, R. The Role of Regional Anesthesia during the SARS-CoV2 Pandemic: Appraisal of Clinical, Pharmacological and Organizational Aspects. Front. Pharmacol.2021, 12, 574091.

4 Rodgers, A.; Walker, N.; Schug, S.; McKee, A.; Kehlet, H.; Van Zundert, A.; Sage, D.; Futter, M.; Saville, G.; Clark, T.; et al. Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: Results from overview of randomised. BMJ 2000, 321, 1493.

5 Lee, S.-H. Does surgical smoke matter? J. Minim. Invasive Surg. 2021, 24, 1–4.

6 Afolabi BB, Lesi FE. Regional versus general anaesthesia for caesarean section. Cochrane Database Syst Rev. 2012;10:CD004350.

7 Bajwa SJ, Kulshrestha A. Anaesthesia for laparoscopic surgery: general vs regional anaesthesia. J Minim Access Surg. 2016;12(1):4-9.

8 Higgins JPT, Green S. Cochrane handbook for systematic reviews of interventions. Version 5.0.2.The Cochrane Collaboration; 2011. [cited 2017 Mar 5] Available from: www.cochrane-handbook.org. » www.cochrane-handbook.org

9 França MA, Araújo SA, Abreu EMF, Jorge JC. Anestesiaperidural: vantagens e desvantagensnapráticaanestésicaatual. Rev Med Minas Gerais. 2015;25(Supl 4):S36-S47

10 Kaya Uğur B, Pirbudak L, Öztürk E, Balat Ö, Uğur MG. Spinal versus general anesthesia in gynecologic laparoscopy: A prospective, randomized study. Turk J Obstet Gynecol. 2020;17(3):186-195.

11 Della Corte L, Mercorio A, Morra I, Riemma G, De Franciscis P, Palumbo M, Viciglione F, Borrelli D, Laganà AS, Vizzielli G, Bifulco G, Giampaolino P. Spinal Anesthesia versus General Anesthesia in Gynecological Laparoscopic Surgery: A Systematic Review and Meta-Analysis. GynecolObstet Invest. 2022;87(1):1-11.

12 Raimondo D, Borghese G, Mastronardi M, Mabrouk M, Salucci P, Lambertini A, et al. Laparoscopic surgery for benign adnexal conditions under spinal anaesthesia: towards a multidisciplinary minimally invasive approach. J GynecolObstet Hum Reprod. 2020 Sep;49(7):101813.

13 Salinas FV, Sueda LA, Liu SS. Physiology of spinal anaesthesia and practical suggestions for successful spinal anaesthesia. Best Pract Res ClinAnaesthesiol. 2003;17:289–303

14 Pusapati RN, Sivashanmugan T, Ravishangam M. Respiratory changes during spinal anaesthesia for gynaecological laparoscopic surgery. J AnaesthesiolClinPharmacol. 2010;26:475–9

15 Sinha R, Gurwara AK, Gupta SC. Laparoscopic surgery using spinal anesthesia. JSLS. 2008;12:133–8.

16 Segal D, Awad N, Nasir H, Mustafa S, Lowenstein L. Combined spinal and general anesthesia vs general anesthesia for robotic sacrocervicopexy: a randomized controlled trial. IntUrogynecol J. 2014;25(3):369-74

17 Sprung J, Sanders MS, Warner ME, Gebhart JB, Stanhope CR, Jankowski CJ, et al. Pain relief and functional status after vaginal hysterectomy: intrathecal versus general anesthesia. Can J Anaesth. 2006;53(7):690-700

18 Salinas FV, Sueda LA, Liu SS. Physiology of spinal anaesthesia and practical suggestions for successful spinal anaesthesia. Best Pract Res ClinAnaesthesiol. 2003;17:289–303

19 Sinha R, Gurwara AK, Gupta SC. Laparoscopic surgery using spinal anesthesia. JSLS. 2008;12:133–8

20 Richardson RF, Sutton CJG. Complications of first entry: a prospective laparoscopic audit. GynaecolEndosc. 1999;8:327–34

21 Hyderally H. Complications of spinal anesthesia. Mt Sinai J Med. 2002;69:55–6