International Journal of Advances in Medicine
Nijhawan DM et al. Int J Adv Med. 2018 Apr;5(2):307-311
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: http://dx.doi.org/10.18203/2349-3933.ijam20180942

Original Research Article

Spinal anesthesia in laparoscopy for infertility

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Received: 02 February 2018
Accepted: 09 February 2018

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ABSTRACT

Background: Spinal anesthesia in laparoscopy for infertility is coming up as a safe and effective alternative to general anesthesia with endotracheal intubation. This retrospective study was undertaken to evaluate the efficacy of spinal anesthesia in laparoscopy for infertility.
Methods: In this retrospective observational study, a total of 100 patients had laparoscopic procedure done during the period January 2017 to December 2017 and were included in the study. Laparoscopic surgeries were performed under general anesthesia.
Results: In our study of 60 patients, 30 (50%) patients underwent diagnostic laparoscopy and 30 (50%) patients underwent operative laparoscopy. Additional analgesia was required in 20 (33.33%) of patients. These patients either had longer operative time for more lengthy procedures or were more anxious. 55 (91.66%) patients were discharged from the hospital in less than 12 hours, 1 (1.66%) patient was discharged within 24 hours while 4 (6.66%) patients were discharged after 24 hours in whom lengthy procedures were performed. Post spinal headache was seen in 22 (36.33%) patients, nausea and vomiting in 20 (33.33%) patients, hypotension in 18 (30%) patients. Conversion to general anesthesia was needed in 3 (5%) patients due to longer operative time.
Conclusions: Spinal anesthesia in laparoscopy for infertility is a safe and effective alternative to general anesthesia with endotracheal intubation.

Keywords: Infertility, Laparoscopy, Spinal anesthesia

INTRODUCTION

Laparoscopy is one of the most common surgical procedures performed nowadays. Careful choice of the anesthetic technique should be selected according to the type of surgery. Regional anesthesia is considered as safe alternative to general anesthesia for outpatient pelvic laparoscopy.[1]

Laparoscopy is the inspection of abdominal cavity through an endoscope. Carbon dioxide is most universally used to insufflate the abdominal cavity. Several pathophysiological changes occur after pneumoperitoneum and extremes of patient positioning. A thorough understanding of these changes is fundamental for optimal anesthetic care.[2]

In 1980s, the Laparoscopic surgery began with the advantage of fewer traumas, safety, less complications & shorter recovery period. Now, it has developed rapidly.[3]

In order to meet the requirements of the operation and to eliminate the anxiety and fear of that patient, endotracheal intubation was the traditional anesthesia method.[4]

A wide variety of anesthetic techniques have been used for laparoscopic procedures. General anesthesia with endotracheal intubation is most routinely used. It is considered to be the safest anesthetic technique. Other techniques like local and regional anesthesia have also been used safely for laparoscopic surgeries.[5]

spinal and epidural anesthesia individually, and combination of the two, are suitable as anesthetic technique for laparoscopy.[6]

Spinal anesthesia is a less invasive anesthetic technique. It has lower morbidity and mortality rates compared with general anesthesia. Spinal anesthesia has the advantage of providing analgesia and total muscle relaxation in a conscious and compliant patient. It also provides an uneventful postoperative recovery.[6]

Routine postoperative care consists of adequate monitoring of vital parameters. This includes continuous monitoring of peripheral oxygen saturation, respiratory rate, ECG, blood pressure measurement, heart rate and regularity.[7]

Postoperative nausea and vomiting (PONV) is common after laparoscopic surgery. Ondansetron given at the end of surgery provides greater anti-emetic effect compared with preinduction. In addition, prophylactic dexamethasone decreases nausea and vomiting after laparoscopy. It may decrease the severity of pain with no adverse effects.[8]

Although, postoperative pain in laparoscopic surgery is less severe compared to an open procedure, it is still considerable. The most effective pain relief can be obtained by combining opioids, local anesthetics, and NSAIDS. This allows the opioids dose to be reduced thereby limiting side effects, reducing postoperative pain and analgesics. It facilitates an earlier return to normal activities. Rectus sheath block, local infiltration of the laparoscopy portals and intraperitoneal local anesthesia can be used for pain relieve.[9]

Gas embolism most frequently occurs on induction of pneumoperitoneum. It can occur at any point during surgery.[9]

Initial steps to manage pneumoperitoneum include immediate deflation of the pneumoperitoneum, institution of 100% FiO_2, placement of the patient in the left lateral head-down position to remove air from the RV outflow track, and hyperventilation to eliminate the increased $PaCO_2$.[10]

The aims and Objectives of the study was to evaluate the efficacy of spinal anesthesia as safe alternative to general anesthesia for laparoscopy in infertility. To evaluate the need for additional analgesia for laparoscopy in infertility. To evaluate the complications of laparoscopy in infertility. To evaluate spinal anesthesia as sole technique for laparoscopy in infertility.

METHODS

This retrospective observational study analyzed 60 cases that underwent diagnostic and operative intervention laparoscopically from September to December 2017 in the department of Obstetrics and Gynecology at Asian Vivekananda Superspeciality hospital, Moradabad, U.P. Case records of patients were reviewed critically.

All diagnostic and operative laparoscopies were performed under spinal anesthesia. Some patients were put in modified Trendelenburg position according to the need. Pneumoperitoneum was created with carbon dioxide insufflator via Veress needle. Sub-umbilical incision was given for 10mm primary port. Quick evaluation of whole abdominal cavity was undertaken by rotating camera through 360 degrees to rule out any adherence of bowel. Decision was made for inserting secondary ports through small incisions under direct vision and trans-illumination, lateral to deep inferior epigastric vessels. At the end of procedure, peritoneal cavity was lavaged. Hysteroscopy either diagnostic or operative was also performed. Instruments and laparoscope were removed under direct vision. Patients who underwent diagnostic or short operative laparoscopic procedures were discharged within 12 hours and patients with long operative procedures were discharged after 24 hours.

Inclusion criteria

Patients who underwent laparoscopy for infertility

Exclusion criteria

Patients who underwent laparoscopy for indication other than infertility

Data of these 60 patients was collected as follows

- Name
- Age
- Indication for laparoscopy
- Type of laparoscopy
- Additional analgesia required
- Complications like nausea and vomiting, headache or hypotension
- Need for conversion to general anesthesia

Data was entered in Microsoft excel sheet and analyzed. Statistics was taken out in percentages.

RESULTS

In our study, majority of patients i.e. 33 (55%) were of 26-30 years, 22 (36%) patients were of 31-35 years, 3

(5%) patients were of 21-25 years, 1(1.66%) patient was of 36-40 years while 1 (1.66%) was above 40 years of age.

Table 1: Age distribution.

Age distribution	No. of patients	%
21-25 years	3	5
26-30 years	33	55
31-35 years	22	36.66
36-40 years	1	1.66
>40 years	1	1.66

Table 2: Type of infertility.

Type of Infertility	No. of patients	%
Primary infertility	35	58.33
Secondary infertility	25	41.66

In our study, 35 (58.33%) patients had primary infertility while 25 (41.66%) had secondary infertility.

Table 3: Type of laparoscopy.

Type of laparoscopy	No. of patients	%
Diagnostic laparoscopy	30	50
Operative laparoscopy	30	50

In our study, 30 (50%) patients underwent diagnostic laparoscopy and 30 (50%) patients underwent operative laparoscopy.

Table 4: Laparoscopic procedures.

Laparoscopic procedures	No. of patients	%
Normal findings	30	50
PCOS drilling	17	28.33
Tubal cannulation	5	8.33
Myomectomy	3	5
Adhesiolysis for per tubal adhesions	2	3.33
Metroplasty	2	3.33
Fulguration of endometriosis	2	3.33
Removal of Ovarian cyst	2	3.33
Septum resection	2	3.33

In our study, 30 (50%) patients had normal findings on diagnostic laparoscopy while 30 (50%) patients needed operative intervention. One or more factor was corrected.

17 (28%) patients underwent ovarian drilling for PCOS, 5 (8.33%) had tubal cannulation for tubal block, Myomectomy was performed in 3 (5%) patients while 2 (3.33%) patients each had Adhesiolysis for per tubal adhesions, Metroplasty, Fulguration of endometriosis, Removal of Ovarian cyst and Septum resection.

Table 5: Duration of laparoscopy.

Duration of laparoscopy	No. of patients	%
Upto 30 min	42	70
30 min-1 hour	15	25
>1 hour	3	5

In our study, in majority i.e. 42 (70%) patients, laparoscopy completed in less than 30 minutes, in 15 (25%) of patients, it took nearly one hour while 3 (5%) patients required more than one hour where more than one problem was corrected.

Table 6: Requirement of additional analgesia.

Requirement of additional analgesia	No. of patients	%
Yes	20	33.33
No	40	66.66

In our study, additional analgesia was required in 20 (33.33%) of patients. These patients either had longer operative time for more lengthy procedures or were more anxious.

Table 7: Hospital stay.

Hospital stay	No. of patients	%
<12 hours	55	91.66
12-24 hours	1	1.665
>24 hours	4	6.66

In our study, 55 (91.66%) patients were discharged from the hospital in less than 12 hours, 1 (1.66%) patient was discharged within 24 hours while 4 (6.66%) patients were discharged after 24 hours in whom lengthy procedures were performed.

Table 8: Anesthetic complications.

Anesthetic complications	No. of patients	%
Headache	22	36.66
Nausea and vomiting	20	33.33
Hypotension	18	30
Conversion to general anesthesia	3	5

In our study, post spinal headache was seen in 22 (36.33%) patients, nausea and vomiting in 20 (33.33%) patients, hypotension in 18 (30%) patients. Conversion to general anesthesia was needed in 3 (5%) patients due to longer operative time.

DISCUSSION

In our study, majority of patients i.e. 33 (55%) were of 26-30 years, 22 (36%) patients were of 31-35 years, 3 (5%) patients were of 21-25 years, 1(1.66%) patient was

of 36-40 years while 1 (1.66%) was above 40 years of age (Table 1).

Moradan S et al found that means for age of the spinal and general groups were 29.7 ± 7.5 and 29.6 ± 8.6 years respectively. The age sub groups frequency and percentages of the spinal and general groups were < 30 years old in 13 (43.3%) and 18 (60%), 30 - 39 years old in 14 (46.7%) and 7 (23.3%), ≥ 40 years old in 3 (10%), 5 (16.7%) respectively.[11]

In our study, 35 (58.33%) patients had primary infertility while 25 (41.66%) had secondary infertility. (Table 2)

Begum A et al found Primary infertility in 29 (60.4%) patients and secondary infertility in 13 (27.1%).[12]

Begum A et al found that major complications were not encountered except in one case where there was bladder injury during exploration of lost IUCD. It was diagnosed and repaired timely after converting into open surgery. Five cases of persistent abdominal pain were due to residual pneumoperitoneum and 2 cases of wound sepsis were encountered.[12]

In our study, 30 (50%) patients underwent diagnostic laparoscopy and 30 (50%) patients underwent operative laparoscopy (Table 3).

Attiya Begum et al reported that diagnostic laparoscopies were 48 (35%), operative were 89 (65%) and 8 (5.8%) laparoscopies were converted into open surgery due to technical difficultie.[12]

In our study, 30 (50%) patients had normal findings on diagnostic laparoscopy while 30 (50%) patients needed operative intervention. One or more factor was corrected (Table 4).

In our study, 17 (28%) patients underwent ovarian drilling for PCOS, 5 (8.33%) had tubal cannulation for tubal block, myomectomy was performed in 3 (5%) patients while 2 (3.33%) patients each had Adhesiolysis for per tubal adhesions, Metroplasty, Fulguration of endometriosis, Removal of Ovarian cyst & Septum resection (Table 4).

In our study, in majority i.e. 42 (70%) patients, laparoscopy completed in less than 30 minutes, in 15 (25%) of patients, it took nearly one hour while 3 (5%) patients required more than one hour where more than one problem was corrected (Table 5).

In our study, additional analgesia was required in 20 (33.33%) of patients. These patients either had longer operative time for more lengthy procedures or were more anxious (Table 6).

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Tzovaras G et al found that there were no conversions from spinal to general anesthesia. Pain was significantly less at 4 hours ($P < .001$), 8 hours ($P < .001$), 12 hours ($P < .001$), and 24 hours ($P = .02$) after the procedure for the spinal anesthesia group compared with those who received general anesthesia. There was no difference between the 2 groups regarding complications, hospital stay, recovery, or degree of satisfaction at follow-up.[13]

Ibrahim et al found that from 1 min to 12 h post-operative there was significant increase in mean heart rate and mean arterial blood pressure in group G than group S. In group (S) 2.5% was converted to open due to shoulder pain and inappropriate level of anesthesia. The operative time between both groups was insignificant. Shoulder pain was found in 5% of group (S). Significantly less analgesic was required in group (S). Nausea was found in 5% of group (G) had and vomiting in 2.5%. No patients of group (S) had back pain. 5% in group (S) had retention and needed urinary catheterization. Early postoperative mobilization was noticed in group S.[14] Chunlei Zhang et al found that the interference after pneumoperitoneum in Group II laryngeal mask combined with spinal epidural anesthesia was bigger than that in Group I epidural block combined with intravenous general anesthesia, SpO_2 decreased, Pet-CO_2 increased. In group I, the HR was significantly accelerated, BP was significantly higher than group II ($p<0.05$) at the time of intubation, extubation and 5 min after extubation.[15]

SAGES found that 24(0.01%) patients required conversion to general anesthesia. Hypotension requiring support was recorded in 846(18.21%) patients and 571(12.29%) patients experienced neck and or shoulder pain. Postoperatively 2.09%(97) patients had vomiting as compared to 29.22% (123 patients) in patients administered general anesthesia.

35.59% (1672) patients required injectable diclofenac for their abdominal pain within 2 hours postoperatively and oral analgesic was required in 2936 (63.21%)patients within the first 24 hours.[16]

CONCLUSION

Spinal anesthesia in laparoscopy for infertility is less time consuming, without much side effects and less complications. So, it is a safe and effective alternative to general anesthesia with endotracheal intubation.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Nijhawan DM, Shembekar MC, Upadhye JJ. Spinal anesthesia in laparoscopy for infertility. Outcome of endoscopic third ventriculostomy: analysis of first 23 cases. Int J Adv Med 2018;5:307-11.