ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

To study the frequency and intensity of post-operative shoulder tip pain(VAS) score in standard pressure v/s low pressure cholecystectomy.

Dr. Deepak Bhardwaj[1] (Resident), Dr. Tripta Bhagat[2] (Professor), Dr. Shalabh Gupta[3](Professor & Head), Dr. Atul Kumar Gupta[4] (Professor)

[1,2,3,4]Department of Surgery, Santosh Medical College & Hospital, Santosh University,Ghaziabad (U.P)

First Author: Dr. Deepak Bhardwaj
Corresponding Author: Dr. TriptaBhagat

Abstract:

Background &Method: The aim of this study is to study the frequency and intensity of post-operative shoulder tip pain (VAS) score in standard pressure v/s low pressure cholecystectomy. Patients with acute cholecystitis and with complications of gallstone disease like gallbladder perforation, empyema, and common bile duct stone were excluded from the study. Ethical clearance from the Institute Ethics Committee was taken. The procedure was explained in detail and informed consent taken.

Result: The comparison of Operative difficulties between the two groups. It was observed that there was a significant difference in Operative difficulties (p value of <0.001). The comparison of VAS between the two groups. It was observed that there was no significant difference in Comparison of VAS (p value of >0.001).

Conclusion: In conclusion, low pressure pneumoperitoneum does result in some benefit to the patient in the form of lower intensity of postoperative pain but the impact on intra-operative hemodynamics is not significant. This needs to be examined through a more complex set up and probably a larger sample size that includes a significant numbers of patients with cardiovascular comorbid conditions.

Keywords:post-operative, (VAS) score, pressure &cholecystectomy.

Study Designed: Observational Study

1. INTRODUCTION

Standard pressure pneumoperitoneum for laparoscopic cholecystectomy employs a pressure range of 12-14mm Hg. An emerging trend has been the use of low pressure pneumoperitoneum in the range of 7-10 mm hg in an attempt to lower the impact of pneumoperitoneum on the human physiology while providing adequate working space. Our study proposes to compares the effects of low pressure pneumoperitoneum with the use of standard pressure of pneumoperitoneum.

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

During laparoscopic cholecystectomy adequate working space is required in the abdomen for good exposure that contributes to satisfactory results and patient safety. Common methods to create working space in the abdomen are pneumoperitoneum and abdominal wall lifting methods such as laparotensor and laprolift.[1] Pneumoperitoneum for laproscopic cholecystectomy is most often created by insufflating carbon dioxide gas into the peritoneal cavity and then holding it at constant pressure till the end of surgery when it is released at the time of withdrawal of the ports.[1,2]Standard pressure pneumoperitoneum, employing a pressure range of 12-14mm hg over prolonged periods has been associated with adverse effects such as decreased pulmonary compliance, altered blood gas parameters impaired functioning of the circulatory system, raised liver enzymes and renal dysfunction ,and even increased intra abdominal venous pressure.

An emerging trend has been the use of low pressures for pneumoperitoneum in the range of7-10mm hg instead of standard pressure pneumoperitoneum in an attempt to lower the impact of pneumopritoneum on human physiology while providing adequate working space this method appears to have a little adverse effect on the cardiac and respiratory function and is suitable for the elderly and for those with chronic cardiac or respiratory diseases.[3,4,5,6]Other possible advantages of low pressures during pneumoperitoneum appear to be lower incidence of shoulder tip pain in the postoperative period and also better quality of life in the week following surgery .

2. MATERIAL & METHOD

The study was carried out in the Department of General Surgery in a tertiary care hospital, in India, over a period of one year from July 2006 to June 2007. All consecutive patients with uncomplicated symptomatic gallstone disease tagged for laparoscopic cholecystectomy were included in the study.

Patients with acute cholecystitis and with complications of gallstone disease like gallbladder perforation, empyema, and common bile duct stone were excluded from the study. Ethical clearance from the Institute Ethics Committee was taken. The procedure was explained in detail and informed consent taken.

The study was done in a randomised prospective manner with a sample size of 60 patients. Patients were randomized into two groups using a random number table. One group with 30 patients underwent laparoscopic cholecystectomy with standard pressure pneumoperitoneum at 14 mm Hg while the other group with 30 patients underwent laparoscopic cholecystectomy with low pressure pneumoperitoneum at 10 mm Hg. The surgeries were performed by two experienced consultant surgeons. During the surgery the first port was inserted at a pressure of 14 mm Hg. In the standard pressure group, the pressure was taken up to 14 mm Hg whilst in the low pressure group the pressure was reduced to 10 mm Hg for the remaining duration of surgery. A standard laparoscopic cholecystectomy was performed with the insertion of four ports at the start of surgery. Intra-operative monitoring was performed by monitoring heart rate and blood pressure non-invasively every 5 minutes. Closure of the rectus sheath was done at 10 mm ports at the umbilicus site and at the epigastric site using absorbable sutures. Skin was approximated at all the port sites using staples.

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

Statistical Analysis:

Statistical analysis was carried out using the chi square and independent student t tests. A p value <0.05 was taken as statistically significant. All information was recorded on the standard proformaattached.Descriptive Statistical analysis was employed to describe data for frequencies,percentages,ratios,range and mean value with one standard deviation.Data were tabulated and entered in Microsoft excel.Analysis was done with the help of IBN SPSS Statistics version 20/GeNIe/Open Bug.Descriptive statistics of the variable from the data collected was carried out.Different parameters were compared using chi square test, Fischer test, unpaired test.

3. RESULTS

OBSERVATION & RESULTS

Table 1: Distribution of the patients according to the groups.

Groups	**Frequency**	**%**
Group A	30	50.0%
Group B	30	50.0%
Total	60	100%

The above table and chart shows the distribution of the patients according to the groups. It was observed that the patients were evenly distributed among the two groups.

Table 2: Comparison of Shoulder Tip pain on Day 0 between the two groups

Group				**P Value**
Group A		**Group B**		
Frequency	**%**	**Frequency**	**%**	
6	20.0%	0	0.0%	<0.001
10	33.3%	0	0.0%	
11	36.7%	0	0.0%	
2	6.7%	7	24.1%	
1	3.3%	15	51.7%	
0	0.0%	7	24.1%	
30	100%	29	100%	

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

The above table and chart shows the comparison of Shoulder Tip pain on Day 0 between the two groups. It was observed that there was a significant differences in Shoulder Tip Pain on Day 0 (p value of <0.001).

Table 3: Comparison of Operative difficulties between the two groups

Group				**P Value**
Group A		**Group B**		
Frequency	**%**	**Frequency**	**%**	
0	0.0%	1	3.3%	<0.001
29	96.7%	7	23.3%	
1	3.3%	22	73.3%	
30	100%	30	100%	

The above table and chart shows the comparison of Operative difficulties between the two groups. It was observed that there was a significant difference in Operative difficulties (p value of <0.001).

Table 4: Comparison of VAS between the two groups

Group				**P Value**
Group A		**Group B**		
Frequency	**%**	**Frequency**	**%**	
0	0.0%	2	6.7%	0.221
29	96.7%	28	93.3%	
1	3.3%	0	0.0%	
30	100%	30	100%	

The above table and chart shows the comparison of VAS between the two groups. It was observed that there was no significant difference in Comparison of VAS (p value of >0.001).

4. DISCUSSION

Major benefit of the laparoscopic cholecystectomy is the avoidance of upper abdominal incision resulting in less post-operative pain and early recovery. But even laparoscopic cholecystectomy is not free from discomfort and pain. Patients usually have abdominal pain and shoulder tip pain after laparoscopic cholecystectomy. Various causes of this pain are peritoneal stretching and diaphragmatic irritation by high intra-abdominal pressure caused by pneumoperitoneum or by CO2 absorption from the peritoneal cavity [2]. Several research

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

studies are done to find out the ways to reduce frequency and intensity of post-operative pain after laparoscopic cholecystectomy.

Intra-peritoneal local anaesthetic instillation, removal of residual CO2 before closure, peritoneal washout with saline, ultrasound guided transverse abdominis plane block with local anaesthetic are the various techniques that have been studied [7-11]. Many post-operative analgesics, e.g., diclofenac sodium, Fentanyl, Morphine, Ketoprofen, Ibuprofen have been studied but none of them showed sufficiently positive results for complete analgesia. Pain after laparoscopic cholecystectomy needs multimodal analgesia for complete pain relief.

Studies have been done to compare the effect of different intra-abdominal pressures on post-laparoscopic cholecystectomy pain [12,13]. It has been shown that low insufflation pressure reduces pain frequency, as well as, pain intensity after laparoscopic cholecystectomy [5]. Analgesic requirement is also less in low pressure technique. There are other advantages of low pressure technique, such as less hemodynamic variation, which is specially beneficial in patients having cardiac disease [12,14]. The increased intra-abdominal pressure due to the pneumoperitoneum causes several cardiopulmonary changes. The increased intra-abdominal pressure increases the absorption of CO2, causing hypercapnia and acidosis, which has to be avoided by hyperventilation. It pushes the diaphragm upwards decreasing the pulmonary compliance and increases the peak airway pressure. Pneumoperitoneum increases the systemic vascular resistance and pulmonary vascular resistance. Carbon-dioxide pneumoperitoneum also predisposes to cardiac arrhythmias. During the early phase of pneumoperitoneum, there is a reduction in the cardiac output by decreasing the venous return. While these cardio-respiratory changes may be tolerated by healthy adults with adequate cardiopulmonary reserve, people with cardiopulmonary diseases may not tolerate these cardiopulmonary changes. About 17% of patients undergoing laparoscopic cholecystectomy have an American Society of Anesthesiologists (ASA) status of III or IV. Low insufflation pressure may be beneficial for these patients.

5. CONCLUSION

In conclusion, low pressure pneumoperitoneum does result in some benefit to the patient in the form of lower intensity of postoperative pain but the impact on intra-operative hemodynamics is not significant. This needs to be examined through a more complex set up and probably a larger sample size that includes a significant numbers of patients with cardiovascular comorbid conditions.

6. REFERENCES

[1] UEN YH,CHEN Y,KUO CY,WEN KC,KOAY LB.R andomized trial of low pressure carbon dioxide elicited pneumoperitoneum versus abdominal wall lifting for laparoscopic cholecystectomy. J Chin Med Assoc. 2007;70:324-30

[2] Chok KS, Yuen WK, Lau H, Fan ST. Prospective randomized trial on low pressure versus standard pressure pnuemoperitoneum in out patient Laparoscopic cholecystectomy.Tech.2006;16:383-6.

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

[3] KocM, ErtanT,TezM,KocpinarMA,Kilic M, Gocmen E, etal. Randomized prospective comparison of prospective pain in lower versus high pressure pneumoperitoneum. ANZ J Surg. 2005;75:693-6.
[4] Esmat ME, Elsebae MM, ElsebaieSB. Combined low pressure pneumoperitoneum and intra peritoneal infusion of normal saline for reducing shoulder tip pain following laparoscopic cholecystectomy. World J Surg. 2006;30:1969-73
[5] Hasukiae S. Postoperative changes in liver function tests: randomized comparison of low and high pressure laparoscopic cholecystectomy. Surg Endosc.2005;19:1451-5.
[6] JorisJ, Cigarini I, Legrand M , Jacquet N, De Groote D, FranchimontP,et al. Metabolic and respiratory changes after cholecystectomy performed via laparoscopy or laparotomy.Br J Anaesth.1992;63:341-5.
[7] Baraka A, Jabbour S, Hammond R et al. End tidal carbon dioxide tension during laparoscopic cholecystectomy. Aneasthesia. 1994;49:403-6.
[8] Barczynski M, Herman RM. A prospective randomized trial on comparison of low pressure and standard pressure pneumoperitoneum for laparoscopic cholecystectomy. SurgEndosc. 2003;17:533-8.
[9] Davidas D, Birbs K, Vezakis A, McMohan MJ. Routine low pressure pneumoperitoneum during laparoscopic cholecystectomy.SurgEndosc. 1999:13:87-9.
[10] Barczynski M, Herman RM. The usefulness of low pressure pneumoperitoneum in laparoscopic surgery. Folia Med Cracow.2002;43:43-50
[11] Vezakis A, DavidasD,Gibson JS, Moore MR, Shah H,LarvinM,et al. Randomized comparison between laparoscopic cholecystectomy and gasless laparoscopic cholecystectomy. SurgEndosc 1999;13:890-3.
[12] Wallace DH, Serpell MG, Baxter JN, O'Dwyer PJ. Randomized trial of different insufflation pressures for laparoscopic cholecystectomy.Br J Surg. 1997;84:455-8.
[13] Perrakis E, Vezakis A, VelimexisG,Savanis G, DeverakisS, AntoniadesJ, etal. Randomized comparsion between different insufflation pressures for laparoscopic cholecystectomy. SurgLaparoEndoscPercutan Tech.2003;13:245-9.
[14] Dexter SP,Vucevic M, Gibson J, McMohan MJ. Heamodynamic consequences of high and low pressure capnoperitoneum during laparoscopic cholecystectomy. Surg Endosc.1999;13:376-81.