Journal of Medical Research and Health Sciences
Received 13 Aug 2021 | Revised 30 Aug 2021 | Accepted 20 Sep 2021 | Published Online 10 Oct 2021

DOI: https://doi.org/10.52845/JMRHS/2021-4-10-2
JMRHS 4 (10), 1492–1496 (2021)

ISSN (O) 2589-9031 | (P) 2589-9023

RESEARCH ARTICLE OPEN ACCESS JOURNAL

Randomized clinical trial of the effect of preoperative Dexamethasone with local anaesthetic on postoperative pain after laparoscopic cholecystectomy

Md Ariful Hoque[1*] | Shamima Nasrin Shadia[2] | Moazzem Hossain[3]

[1]Specialist Anesthesiologist, Square Hospital, Dhaka, Bangladesh

[2]Senior Lecturer, Department of Anatomy, Gonoshasthaya Samaj Vittik Medical College (GSVMC), Mirzanagar, Savar, Dhaka, Bangladesh.

[3]Chairman, Institute of Allergy and Clinical Immunology of Bangladesh,Zinzira,Savar,Dhaka,B

Abstract

Laparoscopy is now a common procedure in many surgeries as it contains many advantages. Local anaesthetic drugs have been using for this purpose to reduce post-operative pain.Addition of dexamethasone with local anaesthetic drugs give prolong post operative analgesia.The study was a randomized prospective type of observational study. The study was conducted in the Department of Anesthesiology of Bangladesh Medical College Hospital. Results were presented in table, charts and expressed as percentages/ proportions, mean and average. In present study among the thirty (30) patients 12(40%) were male and 18(60%) female. The number of Diabetic Patient 9 (23%) out of total 30 study population. , hours of first demand of rescue analgesia is significantly higher in 10 th to 12 hours and average 10.75 hours.The scenario of diabetic patient is, they need less analgesia than non-DM patients. The demand of rescue analgesia average 11.50^{th} hour in Diabetic patients. We need planning for postoperative pain management should initiate in the preoperative period.counseling about the degree of pain that should reduce the patient's anxiety and the fear of unrelieved pain.

Keywords: Dexamethasone, local anesthetic, Laparoscopic cholecystectomy, analgesia

1 | INTRODUCTION

Laparoscopic cholecystectomy causes minimal invasion, less postoperative pain, better cosmetic results, minimal adverse effect and shorter hospital stay.[1–2] Phillipe Mouret introduced Laparoscopic cholecystectomy in 1987 and now a days it become popular for its beneficial effects which is gold standard for the treatment of gallstones disease.[3]Post operative pain of laparoscopic cholecystectomy in an acute, sharp and initiate with surgical trauma and relives with wound healing.[4–6] To

estimation of pain after surgery and for monitoring of effectiveness of management worldwide used most commonly pain scales.[7]Also useful for the assessment of postoperative pain the 100 mm visual analog scale (VAS) and the 11-point numerical rating scale (NRS) .[8–12]

Pain after laparoscopic cholecystectomy which is multifactorial origin.Pain intensity peaks during the first few post-operative hours and usually declines over the following 1-2 days. Beside conventional IV analgesic medications, subcutaneous incision site infiltration has been established as a reliable pain relief method. Local anaesthetic drugs have been using for this purpose to reduce post-operative pain. Adjuvant which enhance post-operative analgesia, can be used in several routes (example: IV, Nerve infiltration, tissue infiltration, neuraxial block). Addition of dexamethasone as an adjuvant to local anaesthetic (example: bupivacaine, lidocaine) can also prolong post-operative analgesic period.[13]

The advantage of adjuvant dexamethasone in infiltration anaesthesia has recently been the focus of investigation as clinical reports suggest improved pain management.[14–15] Dexamethasone has anti-inflammatory as well as analgesic property. They suppress inflammation through inhibition of phospholipase A2. It has been found to block transmission in nociceptive C-fibers but not in myelinated A-beta fibers. Although the exact mechanism of dexamethasone's action is unknown, preliminary studies suggest its addition can impressively prolong the duration of analgesia with minimal adverse effects. It may prolong block duration by increasing the activity of inhibitory potassium channels on nociceptive C fibers or by causing vasoconstriction via glucocorticoid receptor mediated nuclear transcription modulation.[16] The main aim of this study is to observe the effectiveness of preoperative Dexamethasone with local anaesthetic on Postoperative Pain after laparoscopic cholecystectomy.

Supplementary information The online version of this article (https://doi.org/10.52845/JMRHS/2021-4-10-2) contains supplementary material, which is available to authorized users.

Corresponding Author: *Md Ariful Hoque*
Specialist Anesthesiologist, Square Hospital, Dhaka, Bangladesh

2 | MATERIALS AND METHODS

Our present study was a randomized prospective type of observational study. Between January and june 2019, 30 patients undergoing an elective laparoscopic cholecystectomy were included in this study. This study was conducted in the Department of Anesthesiology of Bangladesh Medical College Hospital. Patients of both sex participated in this study. Descriptive statistic were used to computer percentages and averages. Results were presented in table, charts and expressed as percentages/ proportions, mean and average.

Study procedure

Various local anaesthetic drugs (eg: Bupivacaine, lidocaine) are available in market can be used for this study purpose. As bupivacaine is longer duration of action we select it for our study. Here 20mL solution contains 12mL of 0.5%. Bupivacaine solution with 2mL of 10mg Dexamethasone and 6mL of normal saline used. The 100 mm visual analog scale (VAS) score is widely used to measure pain intensity after surgery. We measure the degree of pain with VAS at 1,2,3,4,5,6,7,8,9,10,11& 12 hours after surgery.

3 | RESULTS

In our study among the thirty (30) patients 12(40%) were male and 18(60%) female. Figure 1shows that out of 30 patients 18(60%) were female patients. Figure-2 shows that hours of first demand of rescue analgesia is significantly higher in 10th to 12 hours .In average 10.75 hours . The difference was statistically highly significant.

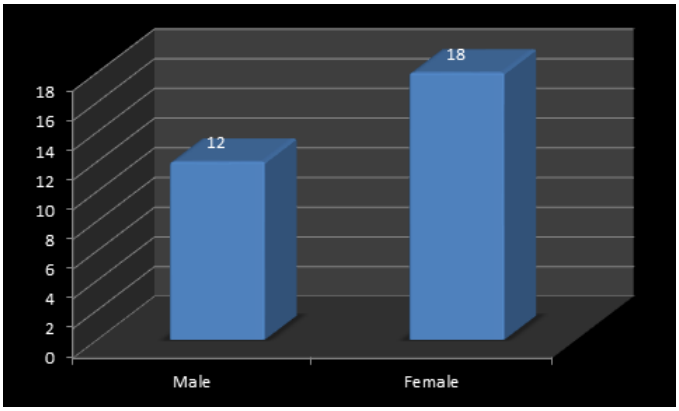

FIGURE 1: Gender DistributionOf Study Population

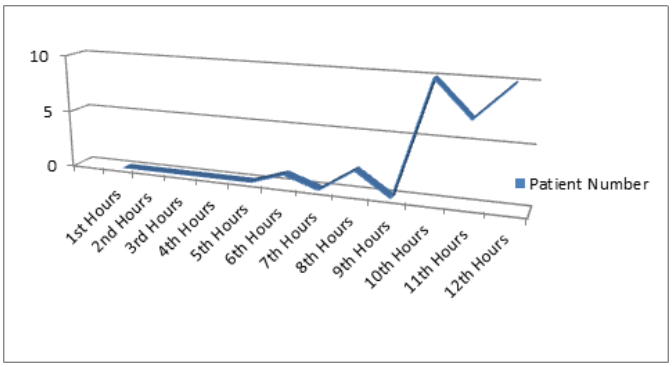

FIGURE 2: Duration of Post-operative Analgesia

Figure 3 shows that number of Diabetic Patient 9 (23%) out of total 30 study population. Table- 3 shows that; demand of rescue analgesia average 11.50^{th} hour in Diabetic patients and demand of rescue analgesia average 10.75^{th} hour in non diabetic patient. In DM patients need less analgesia than non-DM patients.

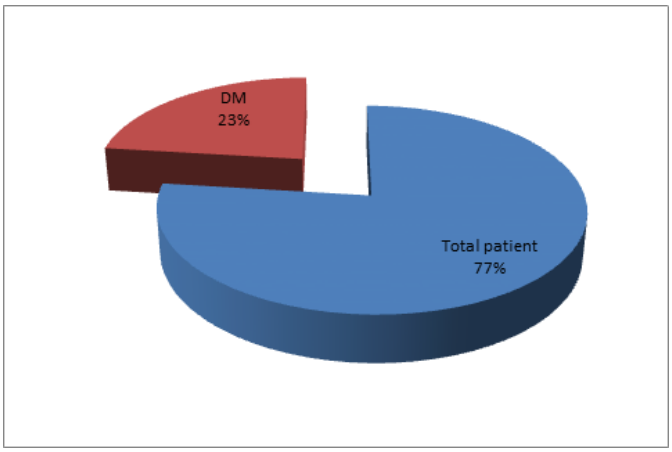

FIGURE 3: Number of Diabetic Patient among study population

TABLE 1: First rescue analgesia in average hour

Type of Patient	First rescue analgesia average hour
Diabetic Patients	11.50^{th} hour
Non-Diabetic Patients	06.75^{th} hour

4 | DISCUSSION

We known that cholelithiasis is very common among females. In the present study 60% of study population were female done laparoscopic cholecystectomy. It signify that female cholelithiasis is more common than in males. A similar study conducted by Ballal M et al female were higher in number.[17] In various studies showed that and a higher prevalence of gallstones has been observed in women in all age groups.[18]

Postoperative pain remains the most prevalent complaint after any surgery. Pain relief is important to reduce hospital stay of patient. sufficiency of post operative pain management give facility to patient early discharge and early return to normal daily activities.[19]Bisgaard T et al. reported that dexamethasone is effective in pain reduction in post operative laparoscopic cholecystectomy .[20]

In the present study use of Dexamethasone with local anesthetic the time of pain postoperative analgesia was obviously prolonged average 10.75 hours . Our results are in similarity with study of Shrestha BR,et.al. [21] As Dexamethasone works with bupivacaine, it will also work with other local analgesics too.

A Few researcher consider due to systemic effect Dexamethasone show analgesic effect 22

5 | CONCLUSION

We have need planning for postoperative pain management should initiate in the preoperative period. Counseling about the degree of pain that they might expect, the pain measurement tools and the modalities of pain management that might be utilized should reduce the patient's anxiety and the fear of unrelieved pain. To reduced patient anxiety need to reduces the incidence of postoperative pain. In addition, patients have to be made aware of the importance of communicating their analgesic needs.

Ethical Clearance

Informed written consent of the patient was taken and written permission has also been taken from concerned department where study was undertaken. Ethical clearance was taken from Bangladesh Medical College Hospital (BMCH).

Authors' Contributions

Md. Ariful Hoque contributions to conception and design, acquisition of data, analysis and interpretation of data, in drafting the manuscript. Shamima Nasrin Shadia contributions to conception and design, analysis and interpretation of data, in drafting the manuscript .Moazzem Hossainhas been involved in analysis and interpretation of data, in drafting the manuscript. All authors read and approved the final manuscript.

6 | ACKNOWLEDGEMENT

We thank the Principal and Director of Bangladesh Medical College Hospital, Dhaka. We also thank Head of Department of Anaesthesia and Head of Department of Surgery, Bangladesh Medical College Hospital. This study is not funded by any institutions.

References

1.joris J, Cigarini I, Legrand M, Jacquet N, De Groote D, Franchimont P, et al. Metabolic and respiratory changes after cholecystectomy performed via laparotomy or laparoscopy. Br J Anaesth 1992; 69: 341-5.

2. Grace PA, Quereshi A, Coleman J, Keane R, McEntee G, Broe P, et al. Reduced postoperative hospitalization after laparoscopic cholecystectomy. Br J Surg 1991; 78: 160-2.

3.Vecchio R, MacFayden BV, Palazzo F. History of laparoscopic surgery. *Panminerva Med.* 2000;42:87–90. [PubMed] [Google Scholar]

4. Rawal N. Analgesia for day-case surgery. *Br J Anaesth.* 2001;87:73–87. [PubMed] [Google Scholar]

5.Ready LB, Oden R, Chadwick HS, Benedetti C, Rooke GA, Caplan R, et al.Development of an anesthesiology-based postoperative pain management service. *Anesthesiology.*1988;68:100–6. [PubMed] [Google Scholar]

6. Joshi GP, White PF. Postoperative pain management: Day surgery. In: Rowbotham DJ, McIntyre P, editors. *Clinical Pain Management – Acute Pain.* London: Arnold; 2003. pp. 329–40. [Google Scholar]

7.Jensen MP, Karoly P, Braver S. The measurement of clinical pain intensity: a comparison of six methods. Pain 1986; 27: 117–26

8. Campbell WI, Patterson CC. Quantifying meaningful changes in pain. Anaesthesia 1998; 53: 121–5 7.

9.Myles PS, Urquhart N. The linearity of the visual analogue scale in patients with severe acute pain. Anaesth Intensive Care 2005; 33: 54–8 8.

10. Bodian CA, Freedman G, Hossain S, Eisenkraft JB, Beilin Y. The visual analog scale for pain: clinical significance in postoperative patients. Anesthesiology 2001; 95: 1356–61 9.

11.Myles PS, Christelis N. Measuring pain and analgesic response. Eur J Anaesthesiol 2011; 28: 399–400

12. Weibel S, Jokinen J, Pace NL, et al. Efficacy and safety of intravenous lidocaine for postoperative analgesia and recovery after surgery: a systematic review with trial sequential analysis. Br J Anaesth 2016; 116: 770–83

13. Alam MS, Hoque HW, Saifullah M, Ali MO. Port site and intraperitoneal infiltration of local anesthetics in reduction of post-operative pain after laparoscopic cholecystectomy. *Med Today.* 2009;22:24–8. [Google Scholar]

14.Ikeuchi M, Kamimoto Y, Izumi M, Fukunaga K, Aso K, Sugimura N, Yokoyama M, Tani T.Effects of dexamethasone on local infiltration analgesia in total knee arthroplasty: a randomized controlled trial.Knee Surg Sports Traumatol Arthrosc. 2014 Jul;22(7):1638-43.

15.Ahmed M.Mageda,Wesam Sayed, Deeb, SaharElbaradieb, Ahmed R.Elzayata, Ahmed

A.Metwallya, MohamedHamed, AhmedShakerd. Comparison of local and intra venous dexamethasone on post operative pain and recovery after caeseream section. A randomized controlled trial. https://doi.org/10.1016/j.tjog.2018.04.004

16. Callery MP. Preoperative steroids for laparoscopic surgery. Ann Surg. 2003; 238:661–662.

17. Ballal M, Jyothi KN, Antony B, Arun C, Prabhu T, Shivananda PG. Bacteriological spectrum of cholecystitis and its antibiogram. Indian J Med Microbiol 2001;19:212–4.

18.Maurer, KR, Everhart, JE, Ezzati, TM, Johannes, RS. Prevalence of gallstone disease in Hispanic populations in the United States. Gastroenterology 1989;96:487.

19. Gayatri P. Post-operative pain services. *Indian J Anesth.* 2005;49:17–9. [Google Scholar]

20. Bisgaard T, Klarskov B, Kehlet H, Rosenberg J.Preoperative dexamethasone improves surgical outcome after laparoscopic cholecystectomy: a randomized double-blind placebo-controlled trial.AnnSurg 2003;238:651-60.

21.Shrestha BR, Maharjan SK, Tabedar S: Supraclavicular brachial plexues block with and without dexamethasone - A comparative study KUMJ 2003; 1 (3): 158-160.

22. .Baxendale BR, Vater M, Lavery KM: Dexamethasone reduces pain and swelling following extraction of third molar teeth. Anaesthesia 1993; 48; 961-964.

How to cite this article: Hoque M.A., Nasrin Shadia S., Hossain M. **Randomized clinical trial of the effect of preoperative Dexamethasone with local anaesthetic on postoperative pain after laparoscopic cholecystectomy**. Journal of Medical Research and Health Sciences. 2021;1492−1496. https://doi.org/10.52845/JMRHS/2021-4-10-2