



ISSN: 2520-5234

Available online at <http://www.sjomr.org>

SCIENTIFIC JOURNAL  
OF MEDICAL RESEARCH

Vol. 3, Issue 9, pp 10-13, Winter 2019



ORIGINAL ARTICLE

## Pre-Operative Single Dose of Antibiotic Ceftriaxone in Preventing Wound Infection in the Laparoscopic Cholecystectomy

Ali Jumaah Ali <sup>1</sup>

<sup>1</sup> Al-Salam Hospital, Ministry of Health, Mosul, Iraq.

### ARTICLE INFORMATION

#### Article History:

Submitted: 24 October 2018  
Revised version received:  
1 December 2018  
Accepted: 3 December 2018  
Published online: 1 March 2019

#### Key words:

Ceftriaxone  
Wound  
Cholecystectomy  
Laparoscopic

#### Corresponding author:

Ali Jumaah Ali  
Email: [alijumaaali15699@gmail.com](mailto:alijumaaali15699@gmail.com)  
Al-Salam Hospital  
Ministry of Health  
Mosul  
Iraq

### ABSTRACT

**Objectives:** This clinical study to evaluate the role of antibiotic prophylaxis in prevention of wound infection in laparoscopic cholecystectomy. And to identify the risk factors for infection.

**Methods:** Prospective study was done from 1<sup>st</sup> June to 31<sup>st</sup> December 2017 in Al-Rabee private hospital for 110 patients under went laparoscopic cholecystectomy (LC).

Group A: the received ceftriaxone 1gm at the time of anesthesia.

Group B: not receive the ceftriaxone.

**Results:** Wound infections were discovered in 3 (2.72%) patients of all cases, 1 (1.66%) from group A and (4%) from group B 30-50 year most common age incidence, gallstone more common in the females.

**Conclusion:** Prophylactic antibiotic are not so necessary to prevent wound infection in patients undergoing laparoscopic cholecystectomy.

*Copyright©2019, Ali Jumaah Ali. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.*

**Citation:** Ali A.J. "Pre-Operative Single Dose of Antibiotic Ceftriaxone in Preventing Wound Infection in the Laparoscopic Cholecystectomy". Sci. J. Med. Res. 2019, 3 (9): 10-13.

### INTRODUCTION

The laparoscopic cholecystectomy has been the standard procedure for the management of gallstone disease since 1990s.<sup>1,2,3,4,5</sup> because it can cure the disease and has low morbidity and mortality<sup>6,7</sup>. The study is shorter and the cost is in LC compared with the open cholecystectomy<sup>8</sup>. The Antimicrobial prophylaxis for various clean or contaminated surgical procedures has become the standard of practice to reduce the risk of post operative infection. However, studies have shown that prophylactic antibiotic are not generally indicated for clean operation<sup>9,10</sup>.

In spite of laparoscopic surgery appear to be associated with similar metabolic responses compared with open surgery<sup>11</sup> and has low risk for infective complication,

Many surgeons still use prophylactic antibiotic, and the use of prophylactic antibiotics for LC is inconsistent and widely among surgeons<sup>9</sup>.

If antibiotic are given empirically they must exert their action when local wound defenses are at their least. Ideally, maximal blood and tissue levels should be achieved at incision before contamination occur. Intravenous administration at induction of anesthesia is optimal<sup>12</sup>.

The development of wound infection related to three factors: 1) The degree of microbial contamination of wound during surgery. 2) the duration of procedure. 3) host factors such as diabetes, malnutrition, obesity, immune suppression<sup>13</sup>. A single preoperative dose of

antibiotic is effective as a 5 days course of postoperative therapy assuming an uncomplicated procedure<sup>14,15,16</sup>. The use of antibiotics preoperatively can reduce the rate of infections, particularly wound infection, after certain operations<sup>17</sup>.

## MATERIALS AND METHODS

A prospective study was done during a period from 1<sup>st</sup> of June to 31<sup>st</sup> of December 2017 for 110 patients in Al-rabee private hospital undergone the laparoscopic cholecystectomy. The two groups were recorded for risk factors of infection, diabetes mellitus, steroid, obesity, smoking, anemia, spillage of bile, age, and duration of operation.

## RESULTS

Table 1 shows the results of age distribution in this study as the following:

Table 1: Age distribution.

Age	Prophylactic antibiotic		No prophylactic antibiotic		Total	
	No.	%	No.	%	No.	%
10-19	0	0	2	4	2	2.2
20-29	5	8.33	4	8	9	8.18
30-39	25	41.66	20	45	45	40.9
40-49	20	33.33	18	37	38	34.54
50-59	6	10	4	8	10	9.09
60-70	4	6.66	2	4	6	5.45
Total	60	100	50	100	110	100

**Gender:** Gallstone more common in female so laparoscopic cholecystectomy done in the females more than men that show in the Table 2.

Table 2: gender distribution.

Gender of patient	group A	group B	Total
Male	5 ( 8.33%)	4 (8.%)	9 ( 8.18 %)
Female	55 ( 91.66%)	46 (92 %)	101 (91.81 %)
Total	60 (100 %)	50 ( 100 % )	110 (100 % )

**Risk factors:** Table 3 shows the risk factors in the patients of this study.

Table 3: The distribution of risk factors.

Risk factors	group A	group B	Total
Diabetes mellitus	2 (3.33%)	3 (6%)	5(5.45%)
Obesity	8 (13.33%)	5 (10 %)	13 ( 11.81% )
Anemia	2 (3.33%)	1 (2% )	2.72 (4.54 %)
Smoking	1 (1.66%)	2 (4%)	2.72 (4.54%)
Steroid	0 ( 0% )	0 ( 0% )	0 ( 0% )
More than 60 min	2 (3.33 %)	3 ( 6% )	5 ( 4.54% )
Bile spillage	6 ( 10% )	5 ( 10% )	11 (10%)
No risk factor	22 ( 36.66% )	19 ( 38% )	41 ( 37.27% )

## Discussion

Despite the controversy surrounding the use of prophylactic antibiotics in laparoscopic cholecystectomy, in western countries 79% of patients undergoing LC have received prophylactic antibiotics pre operatively 63% have received antibiotics postoperatively<sup>18</sup>. The use of prophylactic antibiotics for LC is inconsistent and varies widely among surgeons<sup>19,20</sup>. Postoperative wound infection were in both groups, overall, 110 patients,<sup>3</sup> (2.72%), wound infection were reported during the study.

Only one patient from group A (1.72%) and tow patients from group B (4%) developed wound infection. The results matched with many reports (4.41% in group A and 2.63% in group B )<sup>2</sup>, ( 2% in group A and 4% in the group B )<sup>21</sup>, (2.7% in group A and 3.3% in group B)<sup>22</sup>, and lower than others (6.9 in group A and 8.6% in group B)<sup>4,23</sup>.

The most important result is that prophylactic antibiotic is of no benefit in preventing wound infection, this result is the same of many other studies<sup>21,24,25,26</sup> including:evidence-based, clinical practice guidelines 5,double-blind clinical trial study done by Hamid Reza et al<sup>27</sup>. In meta-analysis of Abhishek Choudhary et al who studied 9 randomized and conclude that prophylactic antibiotics prior to LC resulted in no statistically significant benefit for total infection, superficial infection, major infection, distant infection, and reduction in hospital stay. The strengths of this meta-analysis include use of only randomized and controlled trials, varying populations (Europe, USA, Asia ), and similar outcome in all studies even though various antibiotics were utilized. Also, no heterogeneity was noted and no bias was noted. The limitations of this meta-analysis include uncertainty about the use of prophylactic antibiotics in high-risk patients undergoing LC which is controversial at this time<sup>18</sup>. A Swedish study of 10927 patients who had an elective cholecystectomy performed in 54 swedish hospitals during 2006 and 2007.

Result: The of 54 hospital used prophylactic antibiotics at very different rates, from 0% to 98% of operations, which by far exceeds any random variation. A postoperative abscess was found in 93 ( 0.9% ) and in 377 patients ( 3.5% ) some kind of septic complication occurred requiring antibiotic treatment. In multiple logistic regression analysis, they include that there is huge variation in the use of prophylactic antibiotic in elective cholecystectomy between different hospitals in Swedish reflecting the lack of uniform guidelines. The rate of septic complications from this operation is low and is furthermore unaffected by prophylactic antibiotics<sup>19</sup>.

Iatrogenic gall bladder perforation and spillage of bile and stones is not a come during LC, it occur in of 11 patients ( 10% ) of all cases which nearly similar to other studies where it range from 10.9%<sup>23</sup> to 14%<sup>28</sup>.

Incidence of gall bladder perforation tended to be diminished as the surgeons gain experience<sup>39</sup>. Also, there was no relation between gall bladder and wound

infection the same result of most studies<sup>2</sup>, in contrast with Sabry et al where found that postoperative infection was significantly related to gall bladder perforation, although, organisms isolated from infected wounds were not the same as bile culture<sup>23</sup>.

The low rate of wound infection in LC, which seem to be unrelated to the use of prophylactic antibiotics, may be attributed to many factors including smaller incisions, the tissue handling, less impact on the immune system, minimal exposure to the external environment, CO<sub>2</sub>, pneumoperitoneum, better visibility of tissues for dissection and hemostasis, have been advocated.

## Conclusions

Although the number of patients is not very large, this study found no difference in the postoperative wound infection rate between patients who received prophylactic antibiotics and not received prophylactic antibiotics in elective LC. So we are suggesting that there is no role of antibiotic prophylaxis in prevention of wound infection in elective LC.

## REFERENCES

1. Zacks S.L., Sandler R.S., Rutledge R. and Brown R.S. Jr. "A population-based cohort study comparing laparoscopic cholecystectomy and open cholecystectomy". *AMJ Gastroenterol.* 2002; 97(2): 334-40. DOI:[10.1111/j.1572-0241.2002.05466.x](https://doi.org/10.1111/j.1572-0241.2002.05466.x).
2. Uludag M., Yetkin G. and Citgez B. "The role prophylactic antibiotics in elective laparoscopic cholecystectomy". *JLS.* 2009; 13(3): 337-341.
3. Gelmini R., Franzoni C., Zona S., Andreotti A. and Saviano M. "Laparoscopic cholecystectomy with harmonic scalpel". *JLS.* 2010; 14(1): 14-19. DOI:[10.4293/108680810X12674612014301](https://doi.org/10.4293/108680810X12674612014301).
4. Gaur A. and Pujahari A.K. "Role of prophylactic antibiotics in laparoscopic cholecystectomy". *MJAFI.* 2010; 66(3): 228-230.
5. Bongala D.S.J., Santos R.M.F., Panaligan M.M., Santos N.C.D., Rigor M., Brillantes M. and Anastacio A.L. "Evidence-Based clinical practice guidelines on the diagnosis and treatment of cholecystitis". *Philippine Journal of Surgical Specialties.* 2007; 59(2): 41-62.
6. Keus F., Gooszen H.G. and van Laarhoven C.J. "Open, small-incision, or laparoscopic cholecystectomy for patients with symptomatic cholelithiasis. An over view of Cochrane Hepato-Biliary Group reviews". *Cochrane Database of systematic reviews* 2010; 20(1): CD008318. DOI:[10.1002/14651858.CD008318](https://doi.org/10.1002/14651858.CD008318).
7. Tamhankar A.P., Mazari F., Olubaniyi J., Everitt N. and Ravi K. "Postoperative symptoms, after care, and return to routine activity after laparoscopic cholecystectomy". *JLS.* 2010; 14(4): 484-9. DOI:[10.4293/108680810X12924466007683](https://doi.org/10.4293/108680810X12924466007683).
8. Portincasa P., Ciaula A.D., Bonfrate L., Wang D.QH. "Therapy of gall stone disease: what it was, what it is, what will be". *World J Gastrointest Pharmacol Ther.* 2012; 3(2): 7-20. DOI:[10.4292/wjgpt.v3.i2.7](https://doi.org/10.4292/wjgpt.v3.i2.7).
9. Heineck I., Ferreira M.B. and Schenkel E.P. "Prescribing practice for antibiotic prophylaxis for 3 commonly performed surgeries in a teaching hospital in Brazil". *J Infect Control.* 1999; 27(3): 296-300. DOI: [10.1053/ic.1999.v27.a96193](https://doi.org/10.1053/ic.1999.v27.a96193).
10. Au P., Salama S. and Rotstein C. "Implementation and evaluation of a preprinted perioperative antimicrobial prophylaxis order form in a teaching hospital". *Can J Infect Dis.* 1998; 9(3): 157-166.
11. Redmond H.P., William R. and Watson G. and Houghton T. "Immune function in patients undergoing open VS laparoscopic cholecystectomy". *Arch Surg.* 1994; 129(12): 1240-6.
12. Norman S.W., Christopher J.K., Bulstrode P. and Ronan O.C. "Bailey & Loves Short Practice of surgery". 25th ed. London: Hodder Arnold. 2008; P33-48.
13. Brunicaudi F.C., Andersen D.K., Billiar T.R., Dunn D.L., Hunter J.G. and Pollock R.E. "Schwartz's Principles of surgery". 9th ed. New York: McGraw-Hill. 2010; p.78.
14. The medical letter. "Antibiotic Prophylaxis for surgery. Treatment guidelines". 2004; 2(20): 27-32.
15. Gondret R., Viallard M.L. and Huquier M. "Antibiotic prophylaxis in biliary surgery". *Ann Chir.* 1995; 49(6):493-9.
16. Luchette, Borzotta, Croce. "Practice management guidelines for prophylactic antibiotic used in penetrating abdominal trauma". Available online at: <http://www.east.org.2006>.
17. Nichols R.L. "Preventing surgical site infections: A surgeon's perspective". *Emerg. Infect. Dis.* 2001; 7(2): 220-4. DOI:[10.3201/eid0702.700220](https://doi.org/10.3201/eid0702.700220).
18. Choudhary A., Bechtold M.L., Puli S.R., Othman M.O. and Roy P.K. "Role of prophylactic antibiotics in laparoscopic cholecystectomy: A Meta-Analysis". *J. Gastrointest. Surg.* 2008; 12(11): 1847-53. DOI:[10.1007/s11605-008-0681-x](https://doi.org/10.1007/s11605-008-0681-x).
19. Persson G., Lundstrom P. and Osterberg J. SSAT Abstracts. 2007; A-878.
20. Imai-Kamata S. and Fushimi K. "Factors associated with adherence to prophylactic antibiotic therapy for elective general surgeries in Japan". *Int. J. Qual. Health Care.* 2011; 23(2):167-72. DOI:[10.1093/intqhc/mzq080](https://doi.org/10.1093/intqhc/mzq080).
21. Sharma N., Garg P.K., Hadke N.S. and Choudhary D. "Role of prophylactic antibiotics in laparoscopic cholecystectomy and risk factors for surgical site infection: A randomized controlled trial". *Surgical infection.* 2010; 11(4):367-7. DOI:[10.1089/sur.2008.084](https://doi.org/10.1089/sur.2008.084).
22. Sanabria A., Dominguez L.C. and Valdivieso E. "Antibiotic prophylaxis for patients undergoing elective laparoscopic cholecystectomy (Review)". *Cochrane Database Syst Rev.* 2010; 8(12): CD005265.
23. Mahmoud S.A., Khafagy W.W. and Omar W. "Antibiotic prophylaxis in elective laparoscopic cholecystectomy: A Prospective Study". *EJS.* 2005; 24(3): 146-58.
24. Yildiz B., Abbasoglu O. and Timaksiz B. "Determinants of Postoperative Infection after laparoscopic cholecystectomy". *Hepatogastroenterology.* 2009; 56(91-92): 589-92.
25. Harling R., Moorjani N., Perry C., MacGowan A.P. and Thompson M.H. "A prospective, randomized trial of prophylactic antibiotics versus bag extraction in the prophylaxis of wound infection in laparoscopic cholecystectomy". *Ann R Coll Surg Engl.* 2000; 82: 408-10.
26. Richards C., Edwards J. and Culver D. "Does Using a Laparoscopic approach to cholecystectomy decrease the risk of surgical site infection?". *Annals Of Surgery.* 2003; 237(3):358-62. DOI:[10.1097/01.SLA.0000055221.50062.7A](https://doi.org/10.1097/01.SLA.0000055221.50062.7A).
27. Hemati H.R., Soltany S., Ghorbani R. and Golverdi E. "Effects of prophylactic antibiotics on wound infection in elective

laparoscopic cholecystectomy". Koomesh Journal of Semnan University of Medical Sciences. 2008; 10(1): 37-42. [DOI: 10.19082/2308](https://doi.org/10.19082/2308).

28. Mandato M., Ruggiero R. and Corsale I. "Septic complications of gall bladder lacerations during laparoscopic cholecystectomy". G Chir. 2001; 22(8-9): 277-8.