

## ORIGINAL ARTICLE

**Comparative Role of Different Antibiotics for Non-Perforated Acute Appendicitis a Meta-Base Histopathological Study**

SHAHABUDDIN<sup>1</sup>, MUHAMMAD UMAR<sup>2</sup>, SOHAIL HAMEED<sup>3</sup>, AFZAAL BAIG<sup>4</sup>, HASEEB AHMED<sup>5</sup>, HASSAN ZAHEER<sup>6</sup>, NAVEED SHUJA<sup>7</sup>, ARSLAN SHUJA<sup>8</sup>

<sup>1</sup>Associate Professor Anatomy Department Khyber Girls Medical College Peshawar, Pakistan.

<sup>2</sup>Associate Professor Anatomy Department, Nawaz Sharif Medical College. Gujrat, Pakistan.

<sup>3</sup>Assistant Professor General Surgery, Shahida Islam Medical College Lodhran, Pakistan.

<sup>4</sup>Senior Registrar Surgery Farooq Hospital Akhter Saeed Medical and Dental College Lahore, Pakistan.

<sup>5</sup>Consultant Surgeon, DHQ Hospital Nankana Sahib, Pakistan.

<sup>6</sup>Consultant Surgeon, DHQ Hospital Nankana Sahib, Pakistan.

<sup>7</sup>Associate Professor Biochemistry Department Lahore Medical and Dental College Lahore, Pakistan.

<sup>8</sup>M.Phil Biochemistry (Scholar), Institute of Molecular Biology and Biotechnology (IMBB), The University of Lahore, Lahore, Pakistan.

Corresponding author: Muhammad Umar, Email: [drmmumar@live.com](mailto:drmmumar@live.com), Cell: +92 3004102565

**ABSTRACT**

**Background:** The preferred method of treating appendicitis for more than a century has been appendectomy. Recent trials have challenged this theory. In patients with non-perforated appendicitis, this study evaluated the advantages and disadvantages of antibiotic treatment against appendectomy.

**Aims and objectives:** Surgery vs. non-operative antibiotic treatment for acute non-perforated appendicitis.

**Study design:** A meta-base histopathological study.

**Methodology:** By using inclusion and exclusion criteria, all matched patients were chosen for the study and divided into two groups, group A and group B, using the closed envelop technique. All patients received an injection of injectable ceftriaxone 1 g and metronidazole 500 mg as part of an antibiotic prophylaxis regimen prior to surgery, while group A, patients received a single dosage of the same medications. Intravenous and oral antibiotic regimens, a second- or third-generation cephalosporin or ceftriaxone plus metronidazole injectable. The statistical software for the social science system (SPSS) version 17.0 was used for the statistical analysis. A ( $p \leq 0.05$ ) value was used to denote a significant difference for all statistical tests.

**Antibiotics:** Intravenous and oral antibiotic regimens (i) A second- or third-generation cephalosporin, or ceftriaxone plus metronidazole injectable (ii) single-agent regimens of amoxicillin-clavulanate. (iii) Fluoroquinolone or an advanced generation cephalosporin plus metronidazole, and amoxicillin-clavulanate.

**Practical Implications:** In patients with non-perforated appendicitis, this study evaluated the advantages and disadvantages of antibiotic treatment against appendectomy. In patients with clinically uncomplicated appendicitis, the decision between medicinal and surgical care is value and preference-dependent, indicating the need for a shift in practice towards collaborative decision-making.

**Results:** Seroma was present in ( $12 \pm 0.01$ ) of patients in group A and ( $20 \pm 0.02$ ) of patients in group B; the ( $p \leq 0.05$ ) value is very higher than Group-A, which is statistically insignificant. That implies that post-operative antibiotic medication does not lessen seroma development. In table-2 intra-abdominal abscess formation levels in group-A and Group- B were ( $7.2 \pm 0.02$ ,  $15 \pm 0.02$ ) which indicated that antibacterial postoperative therapy was not effective as pre post- operative. That implies that antibacterial postoperative therapy does not lessen local site edema. People in both groups ( $16.2 \pm 0.01$ ,  $19 \pm 0.02$ ) experienced pus discharge from the stitch line, and the p value is uncertain. Fever was seen in ( $6.5 \pm 0.01$ ) of patients in group A and ( $10.2 \pm 0.02$ ) of patients in group B; their p values were ( $P \leq 0.01$  and  $P \leq 0.02$ ) occasionally. Patients' length of hospital stays were shown that pre and post-surgery treatment was statistically significant than only post-surgery treatment.

**Conclusion:** As a result, we can draw the conclusion from our study that, in cases of non-perforated appendicitis, carefully chosen and appropriately timed pre-operative antibiotics are sufficient in preventing Seroma formation, Intra-abdominal abscess formation, Local site edema, pus discharge from the stitch line, fever and stay in hospital. Post-operative antibiotics were not affect the rate of occurrence of the above mentioned variables.

**Keywords:** Seroma formation, Intra-abdominal abscess formation, Local site edema, Pus discharge from the stitch line, Antibiotics. Appendicitis.

**INTRODUCTION**

The most frequent reason for urgent abdominal surgery worldwide is acute appendicitis. Acute appendicitis affects one in every fifteen people at some point in their lifetime. There are about 40 000 appendectomies performed just in the UK. Around 300,000 appendectomies are performed annually in Pakistan alone<sup>1</sup>. Despite the low mortality rate of appendectomy, which is a common surgical treatment, 6-31 percent of patients experience a complication<sup>2</sup>. Since doctors diagnosis that appendicitis causes pelvic sepsis and has a significant mortality rate, appendectomy has been seen as necessary.<sup>3</sup> Patients with suspected acute non-perforated appendicitis were included, and antibiotic treatment was contrasted with appendicitis removal.<sup>4</sup> Working in teams of two, reviewers independently extracted data using standard forms that had undergone pilot testing and were provided with clear instructions<sup>5</sup>.

In patients with acute non-perforated appendicitis, various systematic reviews and meta-analyses assessed the relative benefits of antibiotic therapy against appendectomy.<sup>6</sup> Instead of approaching the investigations from a mechanistic or explanatory

standpoint, the strategy was to take a practical or pragmatic approach<sup>7</sup>. The comparison was between an immediate appendectomy with the clinically practical alternative of antibiotics first, with appendectomy as necessary, depending on the response to antibiotics, as opposed to comparing appendectomy with an antibiotic for all care. This viewpoint influenced how the findings were presented<sup>8</sup>.

In the included trials, the percentage of patients who had surgery who did not have appendicitis based on histology was quite low 3% in the majority and 15% in one experiment that relied solely on a clinical diagnosis.<sup>9, 10</sup> Some individuals could choose not to undergo an appendectomy due to the uncommon but serious risks connected with general or spinal anesthesia, as well as the potential for both short- and long-term pain from the procedure and a lowered quality of life<sup>11, 12</sup>. However, researchers did not evaluate pain objectively or consistently, and they did not provide any information on quality of life<sup>13</sup>. Over the first year, the recurrent appendicitis rate was almost 23%; it is unknown how much this rate would increase with prolonged follow-up<sup>14, 15</sup>. Similar to this, the introduction of broad-spectrum medications to a sizable

patient base raises the possibility of escalating antibiotic resistance<sup>16, 17</sup>.

**MATERIALS AND METHODS**

**Study design:** A meta-base histopathological study which uncovered the protocol of Surgery vs. non-operative antibiotic treatment for acute non-perforated appendicitis.

**Inclusion Critical:** All patients with uncomplicated acute appendicitis who present to the surgical outpatient or emergency department and each patient was older than 12 years old.

**Exclusion Critical:** Individuals have co-morbid illnesses such diabetes mellitus, benign prostatic hyperplasia coagulopathies, and chronic obstructive pulmonary disease. High risk patients include pregnant women and those with weakened immune systems.

**METHODOLOGY**

By using inclusion and exclusion criteria, all matched patients were chosen for the study and divided into two groups, group A and group B, using the closed envelop technique. After appendectomy in patients with non-perforated acute appendicitis, group A, patients received both pre- and post-operative antibiotic medication, while group B patients received only pre-operative antibiotic therapy. General anaesthesia were used for every procedure. All patients received an injection of injectable ceftriaxone 1 g and metronidazole 500 mg as part of an antibiotic prophylaxis regimen prior to surgery, while group A, patients received a single dosage of the same medications. Following surgery, patients were observed for the following criteria on days 7 and 14 respectively.

**Sample Size:** Total 50 patients of age in between 15-30 years were selected and divided into Group-A and Group-B. 25 individuals of group-A received antibiotics pre and post-surgery while 25 individuals of Group-B were received only post-surgery respectively.

**Variable analysis:** Seroma formation, Intra-abdominal abscess formation, Local site edema, Pus discharge from the stitch line, fever and stay in hospital.

**Antibiotics:** Intravenous antibiotic regimens, ceftriaxone 1 g and metronidazole 500 mg as part of an antibiotic prophylaxis regimen pre-surgery and post- surgery respectively.

**Bio Statistic:** The statistical software for the social science system (SPSS) version 17.0 was used for the statistical analysis. A (p≤0.05) value was used to denote a significant difference for all statistical tests.

**RESULTS**

Table-1: Average age at which non-perforated acute appendicitis occurs, Along with the standard deviation and p-value.

Variables	Group-A Mean±SD	Group-B Mean±SD
Sample size (number)	25±0.02	25±0.01
Minimum age (years)	30±0.02	30±0.02
Median age (years)	20±0.01	20±0.03
Maximum age (years)	15±0.02	16±0.02

(P≤0.05)

Table-2: Average Seroma formation, Intra-abdominal abscess formation, Local site edema, Pus discharge from the stitch line, fever and stay in hospital Along with the standard deviation and p-value.

Variables	Group-A Mean±SD %	P≤0.05	Group-B Mean±SD %	P≤0.05
Seroma formation	12±0.01	0.01	20±0.05	0.05
Intra-abdominal abscess formation	7.2±0.02	0.02	15±0.02	0.02
Local site edema	5.6±0.03	0.03	10.0±0.01	0.01
Pus discharge from the stitch line	16.2±0.01	0.01	19±0.02	0.02
fever	6.5±0.01	0.03	10.2±0.02	0.02
stay in hospital	11±0.01	0.01	21±0.02	0.02

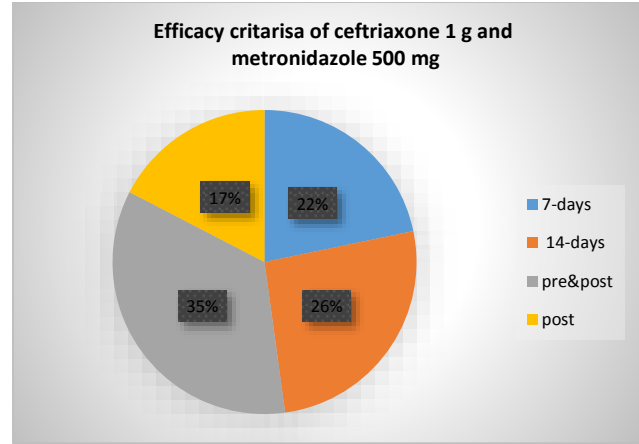


Fig-1

Total 50 patients of age in between 15-30 years were selected and divided into Group-A and Group-B. 25 individuals of group-A received antibiotics pre and post-surgery while 25 individuals of Group-B were received only post-surgery showed in table-1 whereas intravenous antibiotic regimens, ceftriaxone 1 g and metronidazole 500 mg as part of an antibiotic prophylaxis regimen pre-surgery and post- surgery respectively. Seroma was present in (12±0.01) of patients in group A and (20±0.02) of patients in group B; the (p≤0.05) value is very higher than Group-A, which is statistically insignificant. That implies that post-operative antibiotic medication does not lessen seroma development.

In table-2 intra-abdominal abscess formation levels in group-A and Group- B were (7.2±0.02, 15±0.02) which indicated that antibacterial postoperative therapy was not effective as pre past-operative. Similarly the patients in group A and group B experienced local site edema (5.6±0.03, 10.0±0.01). That implies that antibacterial postoperative therapy does not lessen local site edema. People in both groups (16.2±0.01, 19±0.02) experienced pus discharge from the stitch line, and the p value is uncertain. It implies that there is a substantial disparity between the two groups.

Fever was seen in (6.5±0.01) of patients in group A and (10.2±0.02) of patients in group B; their p values were (P≤0.01 and P≤0.02) occasionally. That implies that postoperative antibiotic use does not prevent the onset of fever. In case group A, the average hospital stay was (11±0.01 %) days with a standard deviation of 0.50, while in group B, the average hospital stay was (21±0.02%) days with a standard deviation of 0.02 respectively. Patients' length of hospital stays were shown that pre and post-surgery treatment was statistically significant than only post-surgery treatment.

**DISCUSSION**

Both the patients and the operating surgeons find it concerning when intra-abdominal abscess formation occurs during appendectomies<sup>1, 15</sup>. The variables include the number of hours the patient had pre-operative symptoms, the disease stage, the choice and pre-operative administration of antibiotics, hospital management procedures, and characteristics specific to the patient.<sup>2</sup> In non-perforated appendectomy cases, antibiotics have a significant impact on the rate of intra-abdominal abscess formation<sup>3</sup>. In reality, studies show that their usage in the post-operative period is counterproductive and even debatable in situations of non- perforated appendectomy<sup>12</sup>. Insufficient follow-up was one of the study' other weaknesses<sup>4</sup>. Over the first year, there were about 23% of cases of recurrent appendicitis; it is unknown how much this rate would increase with prolonged follow-up.<sup>5</sup>

In patients with acute non-perforated appendicitis, the current systematic review and meta-analysis assessed the relative benefits of antibiotic treatment against appendectomy.<sup>6</sup> Instead of

approaching the investigations from a mechanistic or explanatory standpoint, the strategy was to take a practical or pragmatic approach<sup>7</sup>. In cases of acute appendicitis without perforation, appendectomy is a clean, contaminated procedure. As a result, the conventional procedure is to administer preoperative antibiotics to all patients having appendectomies, which halves the rate of infection.<sup>8</sup> There is no universally accepted method for using post-operative antibiotics in non-perforated acute appendicitis<sup>15</sup>. Optimized antibiotic use is necessary since the use of antimicrobials leads to the development of antimicrobial resistance<sup>9</sup>.

Different researchers in a studies elaborated that both groups A and B experienced a 10% incidence of local site edema, and their p values are negligible.<sup>11</sup> 10% of the individuals in groups A and B experienced pus discharge from the stitch line, and the p value is not statistically significant.<sup>13</sup> Stitch line inflammatory alterations were present in 6.67% of patients in group A and 10.00% of patients in group B, with a p value of negligible<sup>15</sup>. Fever was seen in 13.3% of patients in group A and 10.0% of patients in group B; their p values are both 1<sup>10, 14</sup>. Hence, we can draw the conclusion that post-operative antibiotics have no effect on the prevention of post-operative problems and that carefully chosen and well timed pre-operative antibiotics are sufficient<sup>16,17</sup>

## CONCLUSION

As a result, we can draw the conclusion from our study that, in cases of non-perforated appendicitis, carefully chosen and appropriately timed pre-operative antibiotics are sufficient in preventing Seroma formation, Intra-abdominal abscess formation, Local site edema, pus discharge from the stitch line, fever and stay in hospital. Post-operative antibiotics were not affect the rate of occurrence of the above mentioned variables.

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**Author's contribution:** All authors contributed to the data interpretation and analysis, authoring the manuscript, language editing, and critical review.

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