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Original Research Article

Impact of Single Dose versus Multidose Prophylactic Antibiotics in Elective Hernia Surgeries

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Abstract:

Background and Objective: Prophylactic antibiotics are routinely used in all surgical patients. The inclusion of plastic biomaterial increases the likelihood of problems with the mesh itself, as well as other recognised complications of hernia surgery.

Materials and Methods: 320 individuals were hospitalised for elective hernia surgery. Surgery was included in the study. The integrated topics were separated into two categories. groupings with an equal number of participants in each: Group A: This group's subjects. At the time of induction, they were administered Amoxycillin-Clavulanic acid (2 gm) intravenously. Group B anaesthesia: Subjects in this group were administered (2 gm) amoxycillin-clavulanic acid intravenously now of anaesthesia induction, followed by Amoxycillin Clavulanic acid (1 gramme) intravenously twice a day for two days after surgery

Results: A total of 320 people were included and sorted into groups.

There are two groupings. There were 160 participants equally split between groups A and B. Out of 160 in Group A, eight participants had surgical site infection, but none in Group B. Group B. There is no statistically significant difference in the incidence of SSI between the two groups. (p=0.45).

Conclusion: Prophylactic antibiotic use in clean elective patients remains a topic of debate. There are several debates. Two studies on antibiotic prophylaxis for hernioplasty were included in this study. Antibiotic prophylaxis courses. Single dosages of the most effective antibiotics were used. The same antibiotics were used in one group and not in the other. Prophylactic dosage in a single dose antibiotic will be effective in preventing post-operative infection.

Introduction

In all surgical instances, prophylactic antibiotics are routinely used. The NICE recommendations emphasise the avoidance of prophylactic antibiotics in clean patients. The European Hernia Society also developed the recommendations, arguing in Grades 1A and 1B that antibiotic prophylaxis does not appreciably reduce wound site infections in nonmesh and mesh procedures, respectively. Many practising surgeons still use antibiotics in clean surgical situations due to an overabundance of dread about infections. Antibiotics must be used correctly in surgical patients; otherwise, misuse of powerful antimicrobials leads to drug toxicity, super infections, and ward colonisation by very rebellious bacteria [1,2]. Surgical Site Infection (SSI) is a common post-operative complication associated with any operation that results in increased hospital stay, lost productive hours, increased hospital costs, and increased morbidity and death [3,4]. While antimicrobial prophylaxis is important in lowering the rate of SSIs, other factors such as the surgeon's experience and method, the duration of the process, hospital and operating-room environments, instrument sterilisation issues, preoperative preparation, and the subject's underlying medical condition may have a significant impact on SSI rates [5,6]. Because of the high frequency of surgical site infection (SSI), antibiotics play a particularly important role in the postoperative treatment of people having elective surgery. It has been found that when a preventive antibiotic is not used, 30-40% of participants develop post-operative SSI. While several recent studies have shown that single-dose (SD) treatment may be equally effective as multiple-dose administration, there is still debate on the incidence and appropriate mix of antibiotics [7,8]. The most common kind of surgery is inguinal hernia repair. The gold standard procedure for inguinal hernioplasty is the Lichtenstein tension-free repair using polypropylene mesh. The most frequent consequence of inguinal hernioplasty is surgical

site infection. Surgical wound reported Infection rates in elective procedures range from 2% for inguinal hernia repair to 26% for colectomy, and are considerably higher in emergency surgery [9-11].

Age (more than 70 years), associated morbidity, operation duration, and routine use of drainage and prosthesis have all been identified as risk factors for SSI. SSI is associated with an increase in length of stay and expenses, as well as a decrease in quality of life. Because of the infection risk when prosthetic materials are used, the use of antibiotic prophylaxis has become increasingly important with the development of tension-free hernioplasty. The addition of plastic biomaterial raises the likelihood of difficulties related to the mesh itself, as well as other recognised issues of hernia surgery.

Materials and Method

The present study was conducted over a two-year period at the department of surgery, SCB medical college, and Hospital, Cuttack. The study included a total of 320 individuals who were hospitalised for elective hernia surgery. The included individuals described the study method, and signed informed permission was acquired before to inclusion. The study was disclosed to the ethics committee, and an ethical clearance certificate was acquired prior to the start of the procedure.

Inclusion criteria

- Adult subjects of either gender between 18 and 65 years
- Subjects scheduled for usual open hernioplasty
- Both direct and indirect inguinal hernia

Exclusion criteria

- Subjects allergic to the given antibiotic
- Strangulated hernia or recurrent hernia
- Subjects posted for emergency surgeries.
- Subjects with severe co-morbid diseases like diabetes, cardiovascular diseases and any other are disqualified from the research

All individuals were subjected to a bespoke inquiry and a pre-anesthetic examination. The integrated topics were separated into two groups, each with an equal number of subjects: A Group: At the time of anaesthesia induction, subjects in this group were administered Amoxycillin-Clavulanic acid (2 gm) intravenously. Group B: Amoxycillin-Clavulanic acid (2 gm) was administered intravenously at the time of anaesthesia induction, followed by Amoxycillin Clavulanic acid (1 gm) intravenously twice a day for two days post-operatively.

All individuals scheduled for these elective operations were admitted the day before surgery. All necessary investigations were carried out, and anaesthetic fitness was obtained. Aseptically, the surgical site was cleansed and shaved. On the day of operation, all participants were asked to wash their hands with soap and the surgical site was covered with a sterile covering.

All of the events were carried out under strict aseptic conditions by consultant surgeons. Hernioplasty was performed using monofilament polypropylene mesh. The surgical site was inspected on the third, fifth, eighth, fourteenth, and thirtieth postoperative days. The stitches were removed on the eighth postoperative day. The cost of the antibiotics included in this study was determined as an average cost of the antibiotics.

Statistical Analysis: The Mean and Standard Deviation are used to retrieve quantitative data. The Chi-Square test is used to assess the relationship between study groups. A 'P' value of less than 0.05 is considered significant.

Results

A total of 320 participants were absorbed and alienated into two groups throughout the procedure. There were 160 participants equally split between groups A and B. In Group A, eight of the 160 participants had surgical site infection, but none in Group B. There is no statistically significant difference in the incidence of SSI between the two groups (p=0.45). On the second postoperative day, six individuals in Group A displayed signs of inflammation. The afflicted participants were then given further antibiotic dosages to address infection and inflammation, which cleared on the fourth postoperative day. On all post-operative days, none of the participants in group B developed SSI. Many participants' main complaints in the post-operative period were pain and headache, which were adequately handled with intravenous fluids for spinal headache and analgesics.

Seroma was discovered in two participants in Group I on the third postoperative day, fluid was extracted, and culture was negative.

Table 1: Incidence of surgical site infection between group A & Group B subjects

Subjects	Group A	Group B	P value
No. of subjects	160	160	-
Incidence of site infection	8	0	0.45

Table 2: Distribution of Incidence of Surgical site infection in relation to various observation days

	Preoperative	2nd day	4th day	8th day	16th day	32nd day
No. of subjects	**160**	**160**	**160**	**160**	**160**	**160**
Infection in group A	**0**	**8**	**0**	**0**	**0**	**0**
Infection in group B	**0**	**0**	**0**	**0**	**0**	**0**

Discussion

Antibiotic prophylaxis is still prescribed in elective surgical operations when the prosthesis is installed; the risk of infection may be fatal at times. Alternatively, the benefit of antimicrobial prophylaxis in elective surgical operations, such as inguinal hernia surgery repair, is debatable [12]. The low prevalence of wound infection and technically good surgical treatment are all considered considerations in addition to the standard use of antibiotic prophylaxis in inguinal hernia repair [13]. Surgical site infection after hernia surgery is associated with an increased incidence of recurrence in hernia repair, resulting in recurrence. Platt et colleagues conducted a randomised double-blind study to shed light on the use of antibiotics in elective surgery [14]. The use of prophylactic antibiotics in all surgical situations has been urged since Bernard and Cole proposed the notion of using antibiotics preoperatively to close wounds and prevent infection in 1964. Overall, information from across the globe has clearly supported using specific antibiotics in the preoperative phase rather than the typical use of 5-7 days of antibiotics in the post-operative period [15,16]. The current original study had 320 individuals in total. All of the individuals were scheduled for elective open hernioplasty and were divided into two groups of 160 each. The rate of surgical site infection (SSI) is similar in the SD group (8%) and the MD group (0%), with 16 participants developing SSI in the SD group and none developing SSI in the MD group. There was no significant difference in surgical site infection (SSI) between the two groups (P =0.295). According to Wideman and Matthijssen's study, cefotaxime and cefazolin are consistently effective in all aspects, and their usage is dependent on cost and accessibility. Many studies have been conducted on the selection of antibiotics and the time of antibiotic use. The majority of study results have indicated that the first dosage be given 30- 60 minutes before surgery, and that a long-acting antibiotic be used.

The prophylactic use of antibiotics in clean elective patients is still a source of contention. This hernioplasty antibiotic prophylaxis study included two types of antibiotic prophylaxis. In one group, the most effective antibiotics were used in single doses, whereas in the other, the same medicines were used. A single preventive antibiotic treatment will be effective in preventing postoperative infection.

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