



ROLE OF ANTIMICROBIAL PROPHYLAXIS IN MESH INGUINAL HERNIOPLASTY – A COMPARATIVE STUDY

General Surgery

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ABSTRACT

INTRODUCTION - Observing the low incidence of infections following inguinal hernioplasty, the need for antibiotics is frequently being questioned. The overuse of antibiotics can result in rising frequency of adverse effects, emergence of drug resistant organisms.

METHODS - In study group, no postoperative antibiotics were used. Open dressing was done in all the patients 24 hours after the surgery. Patients were discharged on next day of surgery and were asked to come for follow-up after one week for wound assessment and suture removal. The postoperative course will be monitored for incidents such as fever, infection at surgical site.

RESULTS - The incidence of wound infection was 7.9% in the study group and 16.4% in the control group. The incidence of wound infection was higher in the control group (those receiving antibiotic prophylaxis) and was found to be statistically significant ($p = 0.028$). Surgical site complications were seen in both study and control groups in the form of erythema, tenderness, wound discharge and seroma.

CONCLUSION - Based on our results we conclude that antibiotics can be very well avoided when it comes to clean surgeries. Surgical practices such as surgical site preparation by clipping hairs and cleaning with 10% povidone iodine solution and spirit are recommended.

KEYWORDS

Inguinal Hernia, Hernioplasty, Infection, SSI

INTRODUCTION

A hernia is a protrusion of a viscus or a part of a viscus through an abnormal opening in the walls of its containing cavity^[1]. These defects most commonly involve the abdominal wall and occur only at sites including inguinal, femoral, umbilical areas etc. Approximately 75% of abdominal wall hernias occur in the inguinal region. Elective surgery for inguinal hernia is a common and simple operation. Globally, the inguinal hernia repair has become one of the most important procedures in improving quality of life and preventing disability. The debate as to whether or not to administer preoperative prophylactic antibiotics in elective inguinal hernia repair still remains controversial as elective hernia repair is considered a clean procedure and as such are exempt from SCIP surgical prophylaxis guidelines.^[2] However, based on guidelines developed jointly by the ASHP, IDSA, SIS, and SHEA all patients who undergo hernioplasty should receive appropriate preoperative I.V. antimicrobials for SSI prevention^[3]. The purpose of this study was to evaluate whether there is any merit in antibiotic prophylaxis in mesh inguinal hernioplasty in reducing the risk of surgical site infections.

MATERIAL & METHODS

SOURCE OF DATA:

Cases admitted and operated in surgery department at Dr. Sushila Tiwari Government Hospital, Haldwani undergoing mesh inguinal hernioplasty were clinically evaluated.

METHOD OF COLLECTION OF DATA:

Data was collected from patient admitted between January 2019 to September 2020 who underwent mesh inguinal hernioplasty in each group of study. Randomization was done with the alternate patient being placed in case and control group. Total 280 patients were studied.

INCLUSION CRITERIA:

1. Patients with age more than 18 years and less than 60 years and fit for surgery
2. Uncomplicated inguinal hernia
3. Patients giving consent to be part of the study

EXCLUSION CRITERIA:

1. Complicated Hernia (Incarcerated hernia, Obstructed hernia, Strangulated hernia)
2. Patient has taken antibiotic in last 7 days for any reason
3. Patients with co-morbid conditions like Diabetes Mellitus, Ischemic heart diseases etc.
4. Patients not giving consent to be part of the study

METHOD OF STUDY:

- All repairs were performed by the same surgeon using the conventional open tension-free mesh technique as described by Lichtenstein.
- In study group, no antibiotic was given at the time of induction of anesthesia; whereas in control group, one dose of injection Ceftriaxone 1 g IV was given at the time of induction of anesthesia.
- Postoperative course was monitored for wound infection and surgical site complications.

OBSERVATIONS AND RESULTS

Table 1: Correlation between Sex distribution & two groups

Sex	Antibiotic Prophylaxis given				p value
	No		Yes		
	Frequency	%	Frequency	%	
F	20	14.3%	33	23.6%	0.119
M	120	85.7%	107	76.4%	
Total	140	100%	140	100%	

Table 2: Correlation between Final Diagnosis & two groups

Final Diagnosis	Antibiotic Prophylaxis given				p value
	No		Yes		
	Frequency	%	Frequency	%	
Bilateral Direct Inguinal Hernia	7	5.0%	6	4.3%	0.095
Bilateral Indirect Inguinal Hernia	12	8.6%	23	16.4%	
Left Direct Inguinal Hernia	10	7.1%	3	2.1%	
Left Indirect Inguinal Hernia	39	27.9%	40	28.6%	
Right Direct Inguinal Hernia	13	9.3%	19	13.6%	
Right Indirect Inguinal Hernia	59	42.1%	49	35.0%	
Total	140	100%	140	100%	

Table 3: Correlation between Wound Infection & two groups

Wound Infection	Antibiotic Prophylaxis given				p value
	No		Yes		
	Frequency	%	Frequency	%	
Present	11	7.9%	23	16.4%	0.028

Absent	129	92.1%	117	83.6%	
Total	140	100%	140	100%	

Table 4: Correlation between Southampton Wound Grade & two groups

Southampton Wound Grade	Antibiotic Prophylaxis given				p value
	No		Yes		
	Frequency	%	Frequency	%	
0	129	92.1%	117	83.6%	0.184
Ia	1	0.7%	11	7.9%	
Ib	2	1.4%	2	1.4%	
Ic	1	0.7%	2	1.4%	
IIa	4	2.9%	4	2.9%	
IIb	1	0.7%	3	2.1%	
IIIa	2	1.4%	1	0.7%	
Total	140	100%	140	100%	

Table 5: Correlation between Intervention required & two groups

Intervention	Antibiotic Prophylaxis given				p value
	No		Yes		
	Frequency	%	Frequency	%	
None	137	97.9%	137	97.9%	0.549
Packing	0	0.0%	1	0.7%	
Suture Removal	3	2.1%	2	1.4%	
Total	140	100%	140	100%	

DISCUSSION

The debate as to whether or not to administer preoperative prophylactic antibiotics in elective inguinal hernia repair still remains controversial as elective hernia repair is considered a clean procedure and as such are exempt from SCIP surgical prophylaxis guidelines. The 2009 EHS guidelines^[4] recommend avoiding the use of prophylaxis in low-risk patients but considering it in patients at a high risk of SSI. The discussion on preoperative antibiotics in inguinal hernias can be delineated by approach. In a double-blinded comparison of antibiotics versus placebo in open inguinal hernias repaired with a mesh plug, antibiotics significantly reduced the rate of surgical site infection^[5] with β -lactam/ β -lactamase antibiotics as the most effective agent followed by first-generation cephalosporins^[6]. Conversely, in open groin hernia not restricted to the mesh plug technique, a recent meta-analysis showed no difference in outcomes when preoperative antibiotics were utilized^[7]. When considering a laparoscopic approach, studies have similarly shown no benefit for antibiotics preoperatively^[8].

In our study of 280 patients, 227 were males and 53 were females. Mean age group of patients in the study group was 38.06 ± 13.49 years and in the control group was 40.65 ± 1.330 years. Most common diagnosis was the right indirect inguinal hernia in both study ($n=59$; 42.1%) and control groups ($n=49$; 35%). Mean duration of operative procedure in the study group was 30.71 ± 3.87 min and in the control group was 31.54 ± 4.87 min ($P=0.119$). Most operations were performed under spinal anesthesia in both the study and control groups. There was also no statistically significant difference found between the type of anesthesia among both the study and control groups ($P=0.991$).

The incidence of SSI following mesh repair of inguinal hernia has been ranging from 0-9%^[9]. In our study, the overall infection rate was 12.1%. The incidence of wound infection was 7.9% in the study group and 16.4% in the control group. The incidence of wound infection was higher in the control group (those receiving antibiotic prophylaxis) and was found to be statistically significant ($p = 0.028$). Surgical site complications were seen in both study and control groups in the form of erythema, tenderness, wound discharge and seroma. Most common complication observed was tenderness found in 8 patients in study group (5.7%) and 21 patients in control group (15.0%) ($P=0.046$). Next most common complication observed was erythema found in 9 patients in study group (6.4%) and 19 patients in control group (13.6%) ($P=0.011$). There were no instances of hematoma formation or wound dehiscence in either control or study group. In a study by Amit Goyal et al^[10], rate of serous discharge and seroma formation was 1% and 22% respectively in group 1 (with antibiotic prophylaxis) while 2% and 26% in group 2 (without antibiotic prophylaxis) also the rate of erythema and stitch abscess were 1% and none in group 1 and 2% and 1% in group 2 respectively.

Majority of the patients had healthy wound in both the study ($n=129$; 92.1%) and control groups ($n=117$; 83.6%). Most infected wounds belonged to Southampton wound grade IIa in both the study ($n=4$; 2.9%) and control groups ($n=4$; 2.9%). Out of 11 patients in the study group with wound infection, three (2.1%) required surgical intervention in the form of suture removal and regular dressing. Remaining cases resolved with regular dressing only. However, in the control group, 23 patients had developed wound infection. Two were managed with suture removal and regular dressing. One patient who had developed seroma was managed with packing of the wound. Remaining patients were managed on regular dressing alone. Mean duration of the length of hospital stay was 3.39 ± 0.94 days in the study group and 3.56 ± 0.95 days in the control group. This was not found to be statistically significant ($P=0.145$).

CONCLUSION

In our study, the rates of SSI were higher in both the study and control groups in comparison with the overall incidence found in the literature. However, the infection rate was higher among the patients who received antibiotic prophylaxis which was found to be statistically significant. Based on our results we conclude that antibiotics can be very well avoided when it comes to clean surgeries. Surgical practices such as surgical site preparation by clipping hairs and cleaning with 10% povidone iodine solution and spirit are recommended.

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