

Role of Antibiotic Prophylaxis in Elective Inguinal Hernia Repair in Taiz -Yemen

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Abstract: -

Background: - A surgical-site infection (SSI) is defined as an infection that occurs at or near a surgical incision within 30 days of the procedure. The decision of perioperative antibiotic prophylaxis is made according to a number of risk factors, in particular, in aseptic interventions. Objectives: to assess the significance of prophylactic antibiotic in SSI in elective inguinal hernia repair. **Patients and methods:** This retrospective, included 129 patients, between the 1st January 2019 to December 2020, were collected their data from medical files, interview and contact with participants. Data was analyzed by used SPSS. **Results:** Among 129 patients, the male was the predominant with 128 (98.5%) with median age was 50 years (IQR 29-60 years). Indirect inguinal hernia was (74.4%), direct was (17.8%) and both (7.8%). The overall infection rate was 7.0% (9 out of 129), the incidence of wound infection in antibiotic group was 4 (6.1%) patients and 5 (7.9%) patients in non-antibiotic group. Antibiotic prophylaxis was associated with decreased incidence of wound infection when compared to non-antibiotic group, but the difference was not statistically significant ($p=0.740$). The most of the infections occurred between the 7th and 12th post-operative day, the average duration of surgery in our study was 49 minutes. All wound infections were treated with antibiotics, the wound was opened in some patients. Mesh was not removed in any of infected wound patients. **Conclusion:** Prophylactic antibiotic usage in patients undergoing tension free inguinal hernioplasty did not show any statistically significant beneficial effects in reduction of surgical site infection.

Keywords: Inguinal hernia, Mesh repair, Antibiotics, Infection.

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Introduction: -

Hernia repair is one of the most common operations performed worldwide, approximately 20 million operations performed annually. Inguinal hernia repair is one of the most frequently performed operations in the UK with 71,000 primary and recurrent inguinal hernia repairs in 2010–2011.¹ The groin hernia represents 75% of hernias.²

Elective inguinal hernia repair is considered a clean operation³. The rate of surgical site infection (SSI) after elective hernia repair is difficult to calculate exactly as SSI developed after patients being discharged. However, one study shows an SSI rate of 4% which may increase up to 9% when these patients are followed up between the 7th and 12th post-operative day after discharge from the hospital.⁴

The occurrence of SSI is depending on non-modifiable intrinsic factors and preventable extrinsic factors as aseptic conditions, surgical technique and perioperative care. Among the extrinsic factors standard infection control measures are very important to prevent SSI.⁵ Additionally, antibiotic prophylaxis is usually given before surgical incision for preventing SSIs.⁶

The degree of wound contamination is an important intrinsic factors and predictor of SSI, whether the wound is clean, clean contaminated, contaminated or dirty. However, and the role of perioperative antibiotic use in the prevention of SSI after such clean

operation is still a subject of major debate.⁶

In developing countries, a lot of money is wasted on the unnecessary use of antibiotic 35% of health budget in comparison to 11% in developed countries.⁶ This high rate may be due to antibiotic misuse for e.g. studies show that prophylactic antibiotic use in such operation is not associated with statistically significant decrease on SSI.³ However most surgeons still use prophylactic antibiotic in elective hernia procedures with a theoretical fear from SSI, especially in procedures that incorporate mesh, 3 for instance, a study in London and the South East of England depended on survey answered by 245 surgeon, shows that 84% support using antibiotic prophylaxis before hernia mesh repair.³ These money wasting and non-evidence based practice of antibiotic misuse has not been studied in Yemen.

In developing countries creating sterile environment in the operation room (OR) and maintaining it is a challenge and may be a major risk factor for SSI, more important than the theoretic risk of SSI when not giving antibiotic.

Thus, the aim of this study is to compare the SSI rate in hernia repair operations whether prophylactic antibiotics administrated or not. Providing that OR staff adheres to the minimum levels of infection control standards.

Patient and method: -

This was a Randomized retrospective study, A total of 129 patients were studied, which were targeting the departments of surgery at Authority of Al Thawra hospital. The sample size of the study consisted of patients with inguinal hernia repairs seen the during 1st January 2019 to December 2020, that fulfilled the inclusion criteria of this study.

Data were collected within the questionnaire based on age, gender, and history for comorbidity as diabetes mellitus (DM), and heart disease. Moreover, we will collect data within the questionnaire based on age, gender, history for any risk factor of hernia as Chronic cough, Constipation, history for any Comorbidity as Hypertension, Diabetes mellitus, renal, liver impairment, moreover the history of smoking, drug use.

Study material and procedure:

All patients planned for inguinal hernia repair were admitted one day before surgery. Patients under gone normal routine detailed clinical history and examination. After enrolling the patients, following investigations were done.

Surgical and anesthesiology techniques:

The patients safety for Spinal or general Anesthesia was assessed by anesthetist. We were given to a preoperative single dose of 1 g intravenous cefazolin.

Procedure: All procedures will be performed by a same surgeon. The groin area will be shaved just before or in the operating theater. patients should

be prepped and draped including groin area, oblique skin incision inferior and medial to the anterior superior iliac spine extended medially for approximately 6 to 8 cm, dissected of Subcutaneous tissues and Scarper' fascia by cautery and the external oblique fascia will be incised to the superficial inguinal ring to expose inguinal canal then genital handling of the genito-femoral nerve, ilioinguinal and iliohypogastric nerves. Spermatic cord will be mobilized at the pubic tubercle by blunt and sharp dissection. Cremaster muscle will be separated parallel when show cremaster artery and vein near inguinal ring can be cauterized or ligated and divided. Indirect hernia present incising the cremaster muscle in a longitudinal direction and dividing circumferentially near the internal inguinal ring help expose the indirect hernia sac. Hernia sac separated from cord and dissected to the level of the internal inguinal ring and the sac is opened and the neck can be ligated at the level of internal ring and sac excise. Direct hernia sacs protrude through floor of the inguinal canal and reduced below the transversalis fascia. Monofilament polypropylene mesh was tailored to its standard shape, which resembled the tracing of a footprint, with a lower sharper angle to fit into the angle between the inguinal ligament and the rectus sheath and an upper wider angle to spread over the rectus sheath. A slit was made at the lateral end of the mesh, creating two tails, a wide. one (two thirds) above and a narrower one (one-third) below. The cord retracted upward, the sharper corner was sutured

with a nonabsorbable monofilament suture material to the insertion of the rectus sheath to the pubic bone and overlapping the bone by 1 to 2 cm. This suture was continued (as a continuous suture with up to four passages) to attach the lower edge of the patch to the inguinal ligament up to a point just lateral to the internal ring.

Follow-up: All patients were educated about the symptoms and signs of surgical site infections and were instructed to report to us in case they developed any such symptoms and signs. The wounds were assessed at the time of discharge (48 hours after surgery) and re-examined at time of 7 days post operation, two weeks after discharge and four weeks after discharge by a surgeon Southampton grading system was used to assessed post-operative wound

Statistical analysis: we were using SPSS statistical software. The association between SSI and antibiotic status were analyzed using chi square test. The effect of duration of surgery, and age were analyzed with Mann Whitney test.

Result: -

From the 1st January 2019 to December 2020, one hundred and twenty-nine patients were included in our study. the vast majority was male that represented 128 (99.2%) hernia repairs and one (0.8%) was women with a male to female ratio 128:1. Median age was 50 years (IQR 29-60 years). The peak incidence of our hernia repair occurred on patients between (17- 30

years. Youngest patient was 17 years old while the oldest patient was 80 years.

In our study, there were no significant difference between age to the antibiotic and non-antibiotic groups ($p=0.158$). Median age of antibiotic group was 45 years (IQR, 25-60 years) and 53 years (IQR, 35-60 years) for the non-antibiotic group.

In the present study 75 (58.1%) patients have right inguinal hernia, while 47 (36.4%) have left inguinal hernia and only 7 (5.4%) patients have bilateral inguinal hernia. Patient group with antibiotic use were 66 (51.2%), that was divided into; 26/66 (39.4%) patients were with left inguinal hernia and 36/66 (54.5%) patients were with right inguinal hernia, and 4 (6.1%) patients had bilateral inguinal hernia. While patients without antibiotic were 63 (48.8%) of those; 21/63(33.3%) patients have left inguinal hernia and 39/63 (61.9%) patients had right inguinal hernia, and 3 (4.8%) patients had bilateral inguinal hernia. When analyzed according to the side of hernia and antibiotic, both groups have statistically insignificant difference ($P=0.410$).

In the present study, 96/129 (74.4%) patients diagnosed as indirect inguinal hernia, 23/129 (17.9%) with direct inguinal hernia and 10/129 (7.8%) with both direct and indirect type. They were divided to two groups regarding to antibiotic; group patients with antibiotic, 50/66 (75.8%) patients were with indirect hernia, 10/66 (15.2%) patients were with direct inguinal hernia and both were in 6/66 (9.1%) patients. While non-antibiotic group had 46/63 (73.0%)

patients with an indirect hernia and 13/63 (20.6%) patients with direct hernia, both 4/63 (6.3%) patients. When we analyzed according to the type of hernia, both groups have statistically insignificant difference (P=0.833).

Regarding the length of the operation, the median length for whole study population was 49 minutes, whereas that of antibiotic group and non-antibiotic group was 46,5 minutes and 50 minutes, respectively. There were not statistically significant (P=0.187).

With regard to infection, 9 (7.0%) patients presented with SSI, 4 (3.1%) patients have been used antibiotics, 5 (3.9%) patients did not take antibiotic. There was no statistically significant difference in antibiotic and non-antibiotic group used (p=0.740).

Table 1

Table1: Overall Infection Distribution on Two Groups Patients

Infection	Antibiotic Group (n=66)		Non-antibiotic Group (n=63)		Total (n=129)	
	N	%	N	%	N	%
Yes	4	6.1	5	7.9	9	7
No	62	93.9	58	92.1	120	
Total	66	100	63	100	129	100

During follow up of the patients at 4th week post-surgery, 2 (1.6%) patients had SSI out of which 1 (0.8%) patient was from antibiotic group while 1(0.8%) patient was from non-antibiotic

group. The difference between two groups is not statistically significant (p=1.000). Urinary retention 6 (4.7%), seroma formation 5 (3.9%) and hematoma 4 (3.1%) were the other complications which patients suffered from during postoperative days.

In our study, 6 (3.87%) patients had culture positive for staphylococcus aureus [2(1.55%) from antibiotic group and 4(2.32%) from non-antibiotic group]. However, 2 (0.9%) patient had culture positive for more than one organism [1 from antibiotic group and non-antibiotic group] while 1(1.5%) patient had one antibiotic group showed no growth.

We found statistically non-significant between age and SSI. The high percentage 3 (2.3%) of infection found among group 51_60 years. The percentage of wound infection in age group (17_30) years was (1.6%) which is equal to the group of patients 61> years old, also equal in both group (31_40) (41_50) that was (0.8%).

Regard to side of inguinal hernia, we found 7 (5.4%) patients with SSI in right side and 2 (1.5%) patients in left side. Infection in indirect inguinal hernia was 5/9 (55.5%), more than in direct inguinal hernia with 3/9 (33.3%). While only one /9 (11.1%) present in combined hernia.

Median operative time for whole study population was 51.04±4.26 minutes, whereas in less than 55 minutes with 2 (1.5%) and more than 55 minutes with 7 (5.4%) and the difference was statistically significant (P=0.005).

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