



COMPARATIVE STUDY OF THREE DOSE ANTIBIOTIC POSTOPERATIVELY VERSUS ONLY ONE DOSE PREOPERATIVE ANTIBIOTIC PROPHYLAXIS IN TREATMENT OF INGUINAL HERNIA REPAIR

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ABSTRACT

Inguinal hernia is one of the most commonly performed surgeries by surgeons all across the world.

Hernia being a clean surgery, regular antibiotic prophylaxis is not needed.^{1,5} However, recent reports suggest that the rate of postoperative wound infection in many countries exceeds more than what is expected for clean surgery, increasing discomfort in patients and health care expenses.

In such a situation the surgeon is in a dilemma whether to give antibiotic prophylaxis in hernia surgery and if it is to be given what should be the optimal number of doses and how frequently the antibiotic doses need to be administered.

Cost considerations and the increase in hospital stay are other hindrances which are to be kept in mind as longer hospital stay also increases the chances of hospital acquired infections as general surgery wards are filled with diabetic foot and cellulitis cases which are heavily infected.

Most of the double-blind randomised controlled trials (RCTs) do not show that the use of antibiotic prophylaxis significantly reduces the rate of SSI. Many studies have been conducted for this conflicting issue and have come up with inconsistent results

This comparative study between the use of three doses postop antibiotic versus only one dose preoperatively antibiotic prophylaxis in hernia repair (mesh and non-mesh) will be done so as to identify the optimum treatment that should be given to the patient, at the same time being cost effective as the increasing use of antibiotics is leading to increase in the number of patients developing resistance to antibiotics, loss of intestinal flora leading to diarrhoea, acidity and other such side effects^{4,10}

KEYWORDS :

INTRODUCTION

Inguinal hernia is one of the most commonly performed surgeries by surgeons all across the world.

Hernia being a clean surgery, regular antibiotic prophylaxis is not needed.^{1,11-15} However, recent reports suggest that the rate of postoperative wound infection in many countries exceeds more than what is expected for clean surgery, increasing discomfort in patients and health care expenses.

In such a situation the surgeon is in a dilemma whether to give antibiotic prophylaxis in hernia surgery and if it is to be given what should be the optimal number of doses and how frequently the antibiotic doses need to be administered.

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AIMS AND OBJECTIVES

- To compare effectiveness in terms of postoperative pain relief, surgical site infection, erythema, surgical site discharge of three dose antibiotic postoperatively vs. only one dose preoperative antibiotic prophylaxis in patients undergoing inguinal hernia repair.
- To compare rate of complications in three dose antibiotic postoperatively vs. only one dose preoperative antibiotic prophylaxis in patients undergoing inguinal hernia repair.

DISCUSSION

In the present retrospective prospective study 100 cases of inguinal hernia repair have been assessed. These cases were divided into one dose and three dose antibiotic. Statistics obtained in this study conducted in tertiary care hospital

between September 2017 and September 2019 have been compared with other studies.

- Age Distribution-In our study the maximum incidence of inguinal hernia was in the age group of 45-60yrs, mean age being 47yrs
- Type of hernia-All types of hernia, direct indirect unilateral and bilateral were taken in the study
- Use of mesh-Almost all hernia repairs were done using prolene mesh except two which were done using the desarda technique
- Comorbidities-Patients with DM are at increased risk of developing SSI but antibiotics as such don't play a role in preventing it, rather perioperative BSL control is important. Out of 16 patients who developed post op complications 4 were diabetic, a detailed study regarding the same should be undertaken. HTN does not increase the risk of SSI. Asthma if not treated can lead to recurrence, long term follow up studies are required for the same
- Post operative complications-
 - Pain-Pain at POD1 and POD3 were measured using Visual Analogue scale and difference in both the groups was statistically not significant
 - Ambulation-48 patients in three dose and 49 patients in one dose group could ambulate on POD1, one patient could not ambulate till POD3 from three dose group who developed SSI and had a lot of pain
 - Suture Site Discharge-1 patient in one dose group and 2 patients in three dose group developed suture site discharge on POD3 which resolved with daily dressing
 - Wound gape-only 1 patient developed wound gape in the entire study who was from the three dose group, external oblique was intact, it was managed conservatively and resolved with regular dressing
 - Erythema-4 patients from both the groups developed mild erythema on POD3 which resolved over the next week
 - Induration-1 patient in the one dose group and 3 patients in the three dose group developed post op induration but not all were associated with discharge I compared my present study with other studies which were done to study the effects of antibiotics in treatment of inguinal hernia

First author, year	Country	Control group		Sample size	Infections	Antibiotic used	Sample size		Infections
		n	%				n	%	
Morales, 2000	Spain	Placebo	287	6	2.09	Cefazolin 2 g. i.v.	237	4	1.7
Yerdel, 2001	Turkey	Placebo	133	12	9.0	Ampicillin + sulbactam 1.5 g. i.v.	136	1	0.7
Aufenacker, 2004	Netherlands	Placebo	505	9	1.8	Cefazolin 1 g. i.v.	503	8	1.6
Celdran, 2004	Spain	Placebo	49	4	8	Cefazolin 1 g. i.v..	50	0	0

repair, the results were as follows with regards to the post op infection.

The present study was different than other studies as the control group was given preoperative one dose of antibiotic while in all other studies no antibiotic was given at all.

Suture site discharge was seen in one patient in the one dose group and two patients in the three dose group. Here suture site discharge is considered as infection and compared with other studies. As hernia is becoming a day care surgery patient can be discharged after being given one dose preoperatively as the study shows that antibiotic dose does not affect the post op complications.

The difference between the post op complications, pain and ambulation in both the groups were not significant. Hence antibiotics do not help in preventing infections so there is no role in giving post operative antibiotic dose in Hernia surgery which is a clean case. More focus should be on asepsis maintained in the OT and by the operating surgeon. Change of gloves while keeping the mesh is a good method to prevent SSI.

The cost of antibiotics further adds to the burden of poor patients seeking surgery. The cost difference is significantly higher and it can be reduced if one dose antibiotic is used. Further, as the concept of Fastrack Surgery is gaining wide acclaim, one dose preoperative antibiotic dose can help in day care approach towards hernia surgery.

LIMITATIONS

Despite the various advantages of the study, the duration of the study was short, which had disadvantages like-

- Rates of recurrences were not taken into consideration (which will need longer follow up)
- Rates of antibiotic resistance in the future is not known

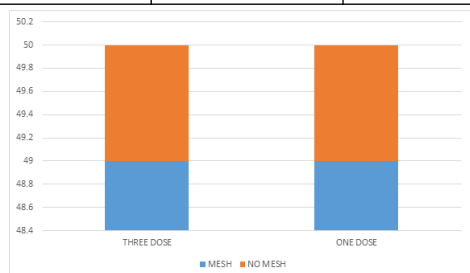
OBSERVATIONS and RESULTS

Retrospective and prospective data of patients operated for Inguinal hernia repair from September 2017 to September 2019 in tertiary care hospital was collected and their full details noted in the proforma. The sample size of 100 was divided into two study groups according to the one dose or three dose of antibiotics given to them, of 50 patients each.

The data was meticulously collected and analysed

- **Use of mesh**-All hernia repairs were performed using prolene mesh except two patients where Desarda technique was used and mesh was not placed

MESH/NO MESH	THREE DOSE	ONE DOSE
MESH	49(A1)	49(B1)
NO MESH	1(A2)	1(B2)

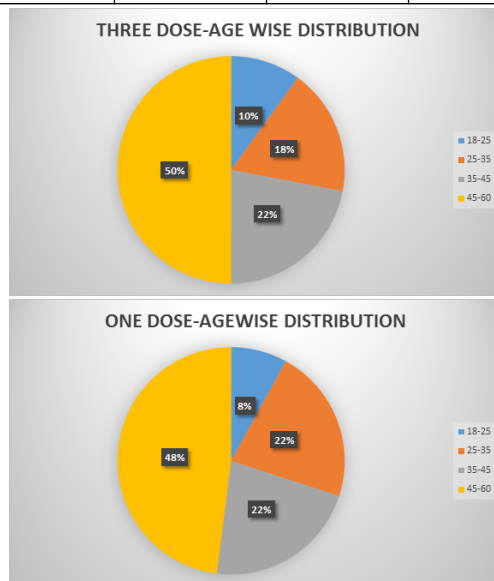


Age:

The patient population in the study varied from a minimum of 18 to a maximum of 60. The incidence was maximum between the age group of 45-60. The mean age was 47yrs

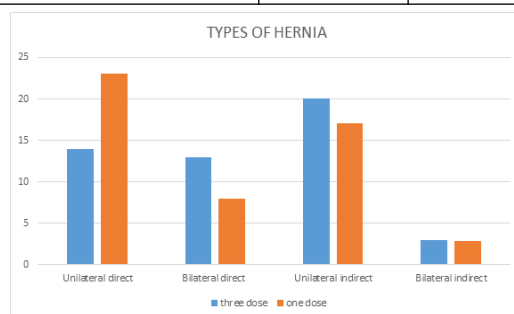
The difference between the age of the two study groups was not statistically significant

Age	Three Dose	%	One Dose	%	Total	%
18-25	5	10	4	8	9	9
25-35	9	18	11	22	20	20
35-45	11	22	11	22	22	22
45-60	25	50	24	48	49	49
TOTAL	50		50		100	
MEAN±SD	47.34±13.129		48.14±13.054		47.74±13.041	



- **Type of hernia**-Matching was tried to be done according to the type of hernia to avoid discrepancies in the results obtained

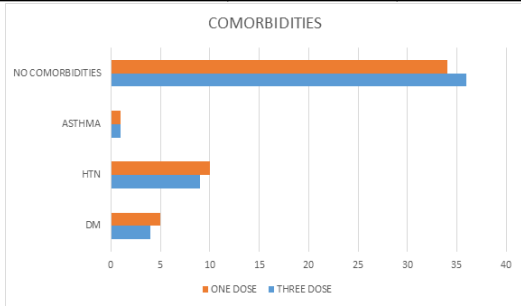
TYPE OF HERNIA	THREE DOSE	ONE DOSE
UNILATERAL DIRECT	14	23
BILATERAL DIRECT	13	8
UNILATERAL INDIRECT	20	17
BILATERAL INDIRECT	3	2



Co-morbidities

The various co-morbidities of patients in the study group were noted with special importance given to Diabetes Mellitus (DM), Hypertension (HTN) and Asthma

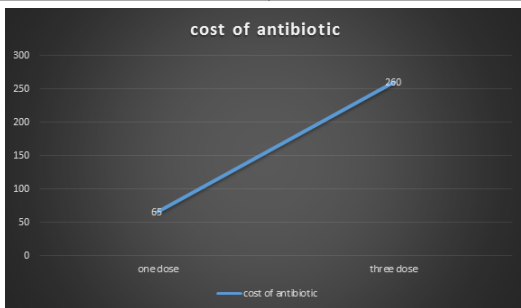
COMORBID CONDITION	THREE DOSE	ONE DOSE
DIABETES MELLITUS	4	5
HYPERTENSION	9	10
ASTHMA	1	1
NO COMORBIDITIES	36	34



Total cost of antibiotics:

Total cost of antibiotics was significantly higher in three dose and as ours is a trust hospital and the lower strata of society comes here for treatment cost is a major hindrance in seeking earlier surgery

THREE DOSE	ONE DOSE
Rs 260	Rs 65



- **PAIN AT POD1**-p value for the two groups for pain at POD1 was statistically not significant

PAIN(VAS)	THREE DOSE	ONE DOSE
0	0	0
1	7	6
2	15	16
3	24	25
4	2	3

p value is 0.289(not significant)

- **PAIN AT POD3**- p value for the two groups for pain at POD3 was statistically not significant

PAIN(VAS)	THREE DOSE	ONE DOSE
0	12	13
1	32	33
2	5	6
3	1	0
4	0	0

p value is 1.108(not significant)

- **AMBULATION**- In this study most of the patients could ambulate on POD1 in both the groups,only one patient from three dose could ambulate on POD3 who was a 60yrs old patient with bilateral hernia who had erythema and induration and a lot of pain

	THREE DOSE	ONE DOSE
POD1	48	49
POD2	1	1
POD3	1	0

- **Post op complications-**

Patients were followed up in wards till discharge and till the

first follow up for suture removal. Relevant complains that were revealed by the patient themselves without any leading enquiry were noted

Post op events	One dose	Three dose	p value
Suture site discharge	1	2	1.000
Wound gape	0	1	1.000
Erythema	4	4	0.712
Induration	1	3	0.610
Total	6	10	

SUMMARY

50 Patients admitted to tertiary care Hospital,operated for inguinal hernia,from september 2017 to september 2019, were divided into one dose and three dose group of 50 each and analyzed either retrospectively or prospectively.Following observations could be made-

1. The highest incidence of inguinal hernia was between 45 to 60yrs of age(almost 50%)
2. There was an increased incidence of SSI in diabetic patients. However this was not statistically significant and needs a dedicated study for the same.
3. The incidence of post operative pain was similar in both the groups and there was no statistically significant difference between the two
4. Except for one patient who could ambulate on POD3 due to SSI and pain and wound gape almost all patients could ambulate on POD1 or 2
5. Post operative complications like erythema, suture site discharge, wound gape and induration was more in three dose group but it was statistically insignificant
6. There were no significant advantages of three dose antibiotic over one dose antibiotic in treatment of inguinal hernia.
7. Increased dose of antibiotic further adds to the cost burden of the patient with no significant benefit to the patient

CONCLUSION

In the present study,100 cases of operated inguinal hernia treated with one dose and three dose of antibiotic(50 each)were retrospectively or prospectively analyzed. As the number of cases were less and duration of study is shorter full statistical evaluation could not be made. Nevertheless following conclusions can be made from the study.

- The incidence of Inguinal hernia is highest in 5th decade.
- There was no significant difference regarding the post operative pain,SSI,wound gape,erythema in both groups.
- Hence blind use of antibiotics in clean surgery as inguinal hernia should not be practiced as it can lead to antibiotic resistance
- Evidence based medicine should be practiced which clearly shows that antibiotics play no role in SSI and other post op complications, rather asepsis in the operation theatre and by the surgeon is of utmost importance during and after surgery while check dressing

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