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ORIGINAL ARTICLE

Surgical site infection in clean cases with or without antibiotics.

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ABSTRACT… Objective: To assess the rate of infection in clean cases with antibiotics or without antibiotics. **Study Design:** Observational Prospective study. **Setting:** Surgical Unit 1, Independent University Hospital, Faisalabad. **Period:** Oct 2022 to February 2023. **Methods:** All patients were selected from surgical wards and OPD. Patients of any age group undergoing clean surgeries were included in this study. The demographic details such as age, gender and type of surgery were recorded for statistical analysis. Patients with Diabetes mellitus, hypertension and immune-compromised patients were excluded from these studies. All patients were kept under observation for 30 days to look any evidence of SSI. **Results:** One group is given antibiotics and the other does not. But No significant difference between the infection rate in both group. **Conclusion:** It was concluded that there is no role of antibiotics in infection control in clean cases.

Key words: Antibiotics, Clean Surgery, Clean Contaminated Surgery, Prophylaxis, Surgical Site Infections.

INTRODUCTION

Infection that occurs at the site of surgery is called as surgical site infection (SSI). SSIs as infections that arise in a period of 30 days following operation or monitoring of surgical infection carried out within 90 days of surgery when an implant has been placed. Implants must be controlled. It is divided into three levels (superficial incisional, deep incisional, and organ or space infection).[1] In low- and middle-income countries, it is the most common kind of infection related to health care Their rates of occurrence vary according to the site of the body and type of surgery. Skin is a natural barrier that protects us from different pathogens to enter and infect the human body. Usually, the chances of surgical site infection are 5% in any surgical procedure.[2] It makes 14%-16% of all nosocomial infection in a hospital.[3] According to studies in Ethiopia SSI is caused by the different bacteria like E. Coli (21.43%), Pseudomonas aeruginosa (19.05%), proteus species (14.29%), Staphylococcus (11.90%) and rest of the infections caused by Klebsiella sp., Citrobacter sp. and Streptococcal sp.[4]

Surgical wounds are classified as clean, clean contaminated, contaminated and dirty wounds.[5] Clean wound are described as having no inflammation encounter in the surgical procedure and body cavities just like respiratory, gastrointestinal, and genital and urinary tracts remains unaffected.[6] The rate of SSI is 3.03% in clean surgeries.[7] Mostly preoperative factors causing SSI is advanced age, obesity, smoking, preoperative shaving and co-morbidities like diabetes, tumor.[8] Operative factors may include faulty scrubbing technique, unhygienic environment, unsterilized instruments and improper ventilation. Post-operative factors include long stay in hospitals, improper use of antibiotics and wound care. Physiological factors like shock hypoxia, hypothermia hyperglycemia blood transfusion and trauma may also contribute in SSI.[9]

Appropriate prophylactic use of antibiotics reduces the risk of infection in surgical procedures. Usually prophylactic use of antibiotics is given in clean contaminated and dirty cases.[10] Usually antibiotics are not recommended in clean cases

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as there is low percentage of SSI. In clean cases prophylactic antibiotics demonstrate no statistically significant decrease in SSI in general surgical cases.[11] Keeping in view the above discussion a study was planned to compare the frequency of SSI in clean cases with and without prophylactic antibiotics use.

METHODS

This prospective observational study was carried out in Surgical Unit 1 Independent University Hospital, Faisalabad from October 2022 to February 2023. All patients were selected from surgical wards and OPD. Patients of any age group undergoing clean surgeries were included in this study. The demographic details such as age, gender and type of surgery were recorded for statistical analysis. Patients with Diabetes mellitus, hypertension and immune-compromised patients were excluded from these studies. All patients were kept under observation for 30 days to look any evidence of SSI. This data was recorded on pre-designed form following this information related to their admission and denial for the present investigation.

Patient Criteria	
Admissive Criteria	**Denial Criteria**
Patients will	Uncontrolled diabetes
Cosmetic requirement of patients	Uncontrolled hypertension
Pain relieve	Immuno-compromised patient
Surgical emergency	

RESULTS

The patients were divided in two distinct groups on the basis of antibiotic treatment naming without antibiotic (Group-1) and with antibiotic (Group-2). Group 1 contain forty-one patients having nine males that made 22% and 32 female patients 78% members of the group. The group 1 with mean age of patients was 30.6 years. By following up we found that only three patients were infected where no preoperative or postoperative antibiotics given and make 3.7% portion of the total patients.

Whereas the comparison of both groups has been elaborated in Table-I.

	Group 1 (Without Antibiotics)	Group 2 (With Antibiotics)
Total Cases	41	30
Male	9 (22%)	13 (43.3%)
Female	32 (78%)	17 (56.7%)
Mean age	30.6(14.87093)	39.8
Infected Cases	3 (7.3 %)	2 (6.7%)
Non Infected Cases	38 (92.7 %)	28(93.3%)

Table-I. Comparison between Group 1 and 2

In chi-square test the p value is 0.647 that is more than 0.5 that shows there is no significance between two groups. Results shows there is no significant difference between the two groups.

Gender * Group Cross tabulation					
			Group		Total
			With Antibiotic	Without Antibiotic	
Gender	Male	Count	13	9	22
		% within Group	43.3%	22.0%	31.0%
	Female	Count	17	32	49
		% within Group	56.7%	78.0%	69.0%
Total		Count	30	41	71
		% within Group	100.0%	100.0%	100.0%

Table-II. Gender*Group Cross tabulation of total patients of group 1 and 2

Parameters	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.704a	1	0.050		
Continuity Correction	2.771	1	0.096		
Likelihood Ratio	3.687	1	0.055		
Fisher's Exact Test				0.071	0.048
N of Valid Cases	71				

Table-III. Chai Square test

			Group		Total
			With Antibiotic	Without Antibiotic	
Cases	Infected	Count	2	3	5
		% within Group	6.7%	7.3%	7.0%
	Non Infected	Count	28	38	66
		% within Group	93.3%	92.7%	93.0%
Total		Count	30	41	71
		% within Group	100.0%	100.0%	100.0%

Table-IV. Cases * Group Cross tabulation of infected and non-infected patients

Parameters	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	0.011a	1	0.916		
Continuity Correction	0.000	1	1.000		
Likelihood Ratio	0.011	1	0.916		
Fisher's Exact Test				1.000	0.647
N of Valid Cases	71				

Table-V. Chi-square test of the infected and non-infected patients

DISCUSSION

The present research depicted that the rate of infection in clean cases with antibiotic use was 6.7% and in patients who was not given any type of antibiotics was 7.3% which is still higher as compared to developed countries like USA where the infection rate is 2.1% in NNIS system hospitals.[12] Worldwide it was observed that the rate of infection in clean cases varies between 2-20%. The lowest extreme of infection lies in developed world like USA (2.1%) whereas in third world countries like Euthopia it reaches up to 20%.[13] Moving towards Pakistan the rate of SSI is variable, depending upon different localities as it is found 4.88% in KPK[14] and 5.3% in Jamshoro Sindh.[15]

The effectiveness of the administration of prophylactic antibiotics is well established for certain surgical procedures, leading to a reduction in SSI rates, duration of hospital stay, as well as postoperative morbidity. However, inappropriate administration of antibiotics, whether by the employment of a poor antibiotic regimen or the excessive use of antibiotics postoperatively, is a major reason for the emergence and spread of multi-drug-resistant organisms in both hospital and community settings. Kreisel et al. examined the relationship between prophylactic antibiotic therapy and the development of clostridium difficile toxin positivity and reported a five-fold greater risk of positivity with inappropriate prophylaxis. Antibiotics are also the most common class of medications implicated in drug allergy and anaphylaxis.[16]

The major reason of higher percentage of clean cases of clinical infection was that the population in third world countries and developing world is un-educated and don't have enough know how about the wound care at home.[15] Another reason might be the infectious patient belongs to low Socio-economic families.[17] Other factors like preexisting infection, obesity, poor compliance after surgery, poor wound care, lack of basic medical education played a major role in such results.[18]

The present study demonstrates a very low rate of postoperative wound infection in clean surgical procedures without the administration of preoperative prophylactic antibiotics. These findings are in accordance with similar findings reported in various other studies. Larger studies with greater sample sizes are needed to better elucidate the outcomes of SSIs in clean surgical procedures with no administration of prophylactic antibiotics, especially since there are no formal guidelines that can guide surgeons in making informed decisions.[19]

CONCLUSION

It was concluded that there is no role of antibiotics in infection control in clean cases.

The present study demonstrates a very low rate of postoperative wound infection in clean surgical procedures without the administration of preoperative prophylactic antibiotics.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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2	Talha Farrukh Awan	Methodology, Interpretation.	
3	Tahir Nadeem	Research result.	
4	Fatima Sajid	Data Analysis.	
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