

Is support of antibiotics in postoperative period required in planned elective surgeries

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Abstract

Background: About 14 to 16% of all nosocomial infections among the hospitalized surgical patients are due to surgical site infection and it is third most frequently reported. Planned surgeries are an elective approach with proper preparation of the part to be operated and of the patient himself. The study describes the efficacy of the use of postoperative antibiotics in planned surgeries.

Materials and Methods: Current study, 90 patients undergoing elective planned surgeries were randomly enrolled for the follow up studies from June 2018 to May 2019 at Surabhi Institute of Medical Sciences and General Hospital, Siddipet, Telangana. Enrolled patients were divided into two groups (I and II). Group I have not received any antibiotics and Group II has received antibiotic treatment as a part of post-operative treatment. Patients were evaluated preoperative, operative and post-operative periods during their stay at hospital. Statistical significance was proved at $p < 0.005$ at 95% confidence interval.

Results: Suggests that group I and Group II has not significantly different in post-operative wound healing. Over all infection rate with drain was significantly higher but the groups were statistically not significant.

Use of prolene mesh implants (30.3%) has shown higher SSI rate when compare to another group where no mesh was used.

Conclusion: Use of postoperative antibiotics can be avoided or restricted if the surgeries are performed under strict aseptic precautions as we found no prevalence of infections between the groups. Use of more antibiotics in postoperative period should be avoided to safe guard the patient’s interest.

Keywords: Antibiotics, Elective surgery, Surgical site infection (SSI), propelne mesh and prophylaxis.

Introduction

Even though procedures of surgeries have made more advances, such as Laparoscopic, laser pression and general surgeries the post-operative wound healing is the most common complication faced by surgeons. According to National Nosocomial Infection Surveillance (NNIS) system reports of the Centre for Disease Control (CDC), Surgical site infections (SSI) are the third most reported and contribute to 14 to 16% of all nosocomial infections among the hospitalized patients [1]. Surgical site infections (SSI) are defined as “an infection related to an operative procedure that occurs at or near the surgical incision within 30 days of the procedure or 90 days if prosthetic

material implanted [2]. Bratzler et. al, described a new clinical criterion for defining SSI [3]. The diagnosis is made when one or more of the following is present: a purulent exudate, a positive fluid culture, surgeon's diagnosis of infection or a surgical site that requires reopening [4]. Factors which contribute to spread of these infections, are poor infection control practices or not following the Good Clinical Practise (GCP) protocol and indiscriminate use of antimicrobial drugs among the health care enters. As result they are more chances of developing septicaemia induced deaths. Apart from causing discomfort and anxiety to the patients, it can delay the recovery and permeant disability [4]. A wound classification developed over 35 years ago based on the amount of expected microbial contamination is still largely used in clinical practice today [5]. Wounds were classified as Bacterial access to wound can be prevented by aseptic surgical techniques. By any reason if microorganisms gain a foot hold and infection become imminent antibiotics has to contribute to prevent the further growth of bacteria and to treat infections [5]. Improper use these antibiotics lead to the emergence of multidrug resistance (MDR) strains of organisms, these are very difficult to eradicate and new antibiotics should be used to handle the new strains which causes more damage to liver and kidney.

The aim of the current study is to evaluate the trends of postoperative antibiotic prophylaxis and the incidence of surgical site infections if elective surgeries are performed with proper care and aseptic precautions.

Materials and Methods

Current study randomly enrolled 90 cases that were posted for planned elective surgeries, at department surgery, Surabhi Institute of Medical Science and Hospital, Siddipet, Telengna between June, 2018 –

May, 2019. Both male and female aged about 30 to 60 years were enrolled for the studies. The enrolled patients were divided into two groups (I and II), Group I- no support of antibiotics, Group II support of antibiotics in post-operative period. Group I have 44 and group II has 46 cases who underwent elective planned surgeries. Evaluation of patient was done in preoperative, operative and post-operative period all vital parameters were recorded. Patient with diabetics and hypertension were excluded from the studies. Informed consent was obtained from the enrolled patients of elective surgeries prior to start of surgery. Institutional ethical permission was obtained from Institutional Review Board (IRB).

Patients were screened in pre-operative phase including history, recording of vital signs, laboratory and radiological investigation according to surgical protocol and were included with special reference to any factors that could not lead to post-operative infections. Postoperative phase principals of asepsis were compulsory and strictly followed, patients were subjected to operative part preparation by shaving on operative day with savlon bath in night before and on the day of procedure. Betadine scrub was applied to operative area just before induction. 30 minutes before the incision all the patients received the same antibiotic (Taxim 1gm IV) as a prophylaxis.

Intraoperative findings were grouped into Cat I- clean, Cat II- clean contaminated, Cat-III contaminated, Cat-IV dirty, care was taken to maintain haemostasis, proper tissue handling, drains, implant and skin closures during the surgery. Post-operative phase, patients in group II were administered antibiotic (Taxim 1gm IV). In both the groups supportive and recovery phase was studied in post-operative phase. Wound status was monitored during the post-operative

period with the frequency of dressing 1,2,3 and followed on day 7 during these days of dressing wound hematoma, drain output, discharge and suture removal were also recorded.

Statistical analysis: Calculation of sample size was done by using thumb rule, where prevalence of 20% and absolute precision of 0.05 with 95% CI was considered, cases were randomly allocated for the study. Descriptive analysis of the collected data was performed. Data presented in the form % change and Pearson’s chi-square (χ^2) was used for assessing the relationship between the nominal values of postoperative antibiotic use and the presence of infection. Statistical significance was defined at $P < 0.05$ was considered to be significant at 95% confidence interval. Online post-operative infection rate calculator was used to calculate the SSI. Data was analysed by using online Sigmasat and Grahpad Prism.

Results:

Group II (antibiotic group) 46 patients who received post-operative antibiotics (TAXIM 1gm IV) there were 26 males and 20 females, Group I has 44 patients who did not received post-operative antibiotics, there were 18 females and 26 males. All the operations were elective planned procedures, hernioplasty being commonest procedure in the study (40%). All operations were open surgeries except for 10- laparoscopic cholecystectomy, 10- laparoscopic appendectomy and out of 90 patients 10 were infected SSI was about 11.11%. Thus, there was no change in occurrence of SSI whether postoperative antibiotics were used or not. In Group I, infection rate for drain group was 30.33% and for no-drain group was 11.11%. Also, overall infection rate with drain was 30.33% and without drain was 11.11%, suggesting drain as a possible cause of infection in both groups. Findings

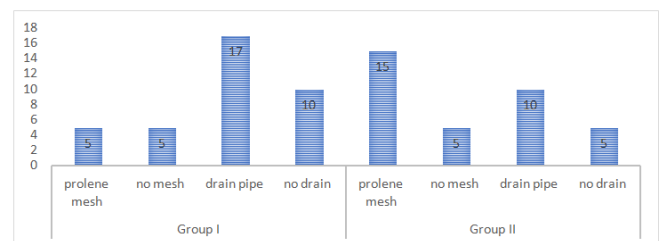
also suggest that, out of the 30 patients in whom a Prolene mesh was implanted, 5 patients were infected in group I and 15 in group II. The SSI rate was 16.66% and was higher than that of those patients in whom no prosthesis was used 5 out of 60 patients SSI rate 8.33%. The group II patients who received antibiotics in post-operative period, infection rate was higher (37%) in both implants and drain category patient. The prolene mesh used category was statistical not significant ($p > 0.05$) with the no mesh used group. Drain pipe group was not shown significance with non-drain group ($P > 0.05$) at 95% confidence interval. (Table-1 Figure 1).

Table 1- No of infected patients in group I and Group II.

		No of patients	Infected patients		P value
			Group I (No Antibiotic)	Group II (Antibiotic)	
Implants	Prolene mesh	30	5	15	0.17
	No prolene mesh	60	5	5	
	SSI%	90	8.33%	16.66%	
Drain	Drain pipe	30	17	10	0.80
	No drain pipe	60	10	05	
	SSI%	90	30.33%	11.11%	

Values presented as % of infected patients, chi-square test statistically not significant between two groups (implant and No implant, drain and non-drain category). Group I and Group II statistically not significant.

Figure 1: No of infected cases in group I and Group II- use of non-use of implant and drain pipe.



Discussion

The current study highlights one of the factors for prevention of surgical site infection i.e, role of use of antibiotics in post-operative period in 90 patients, who have undergone elective surgeries during the 2017-2018. In both groups out of 60 patients 40 has wound infection total infection rate was 66.66% and it signifies there is no difference between the groups. Previous studies showed similar results which are in agreement with our study [1,2,3]. Infection rate of drain group in group I was 20% and for no drain group was 2.86% with overall infection rate with drain was 10.71% and without drain group was 13.3%. 153 patients had SSI out of 1149 patients in whom drains were inserted study by Byrne D.J. et.al [4]. In another study 34 out of 2317 patients in whom drains were inserted were infected [5] these two studies are in agreement with our study. We found there was an increase rate of infection in drain patients then that of non-drain patients ($p>0.05$) but there is no significant difference between the groups. In our study prolene mesh implanted patients (30) only 20 where with SSI rate of 22.22% and was higher than that of no prolene Implanted patients 10 out of 60 but it was statistically not significant ($p>0.05$). In current study group II patients who have received antibiotics in post-operative period the infection rate was 21.43% and in prolene mesh implanted when compared to the non-prolene implanted group there was statistical difference in between these two groups ($p>0.05$), the findings highlights the use of antibiotics in prolene mesh implanted group when compared to non-prolene implanted group [5].

Our study also demonstrated that indiscriminate use of antibiotics in post-operative period is not in the best interest of patient if standards of the good clinical practise and standard operating procedures may be

followed to decrease the use of antibiotics post operatively.

Limitations of the study: Smaller sample size is the limitation of the study more studies are warranted with more sample size with clustering sample method.

Conclusion

We failed to demonstrate the benefit of prescribing post-operative prophylactic antibiotics to patients who underwent elective planned surgeries. When surgeries are performed under strict aseptic precautions with the strict adherence of good operating technique, ideal sterilization techniques, aseptic and antiseptic care may play an important role in prevention of surgical site infection (SSI). Prophylactic post-operative antibiotics may have a role in prevention of surgical site infections in surgeries where an implants has been used, but there was no role of antibiotics with drain patients. Unwarranted antibiotic administration may pose harm to the patient as gastrointestinal side effects, allergic reactions and/or antimicrobial resistance. Furthermore, it places a great burden on the healthcare system. Use of antibiotics in post-operative period is not in the best interest of patients. More studies with more sample size in elective single surgeries are warranted.

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