

THE DISTRIBUTION OF PATHOGENS, RISK FACTORS AND THEIR ANTIMICROBIAL SUSCEPTIBILITY PATTERNS AMONG POST-SURGICAL SITE INFECTION IN RIZGARI TEACHING HOSPITAL IN ERBIL/KURDISTAN REGION/IRAQ

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(Received: June 24, 2018 ; Accepted for Publication: April 15, 2019)

ABSTRACT

Objectives: to find out the incidence of Post-Surgical Site Infections, risk factors, types of the isolated bacteria and their antibiotic susceptibility patterns for patients admitted to Rizgari Teaching Hospital in Erbil city.

Methods: A prospective study was performed on 160 patients admitted to Rizgari Teaching Hospital for surgical operations over a period of six months (November 2015 to June 2016). Culture, identification and sensitivity tests for the isolated organisms from Post-Surgical Site Infections were done by using VITEK 2 systems in Laboratory of Rizgari Hospital.

Results: The incidence of PSSIs was 19.4%. *E.coli* was the most common isolated pathogen (29.2%) followed by *Staphylococcus aureus* (20.8%). Both *Klebsiella pneumoniae* and *Coagulase Negative Staphylococcus* had 12.5% for each. *Pseudomonas aeruginosa* and *Enterococcus faecium* had 8.3% each and both *Acinetobacter baumannii* and *Streptococcus spp.* had only 4.2% each. There was 100% resistance of *E. coli* regarding third generation cephalosporin but were 100% sensitive to Imipenem and meropenem. 60% of *Staphylococcus aureus* were resistant to oxacillin (MRSA). Smoking, past medical history, contaminated wounds, long duration of operation, and improper use of antibiotics were risk factors.

Conclusion: There was an increased rate of PSSIs due to risk factors. There were multi-resistant strains of isolated bacteria mainly *E.coli* and *Staphylococcus aureus* which denotes the abuse of antibiotics. This can be attributed to lack of proper guidance for the use of antibiotics both prophylactically and postoperatively.

Keywords: Post-Surgical Site Infections, Hospital Acquired Infections, *E. coli* and *S. aureus*.

INTRODUCTION

Post-surgical wound infections are a common cause of Nosocomial Infections world-wide, accounting for 38% of nosocomial infections in USA where it is estimated to affect 2-5% of patients undergoing surgical operations¹.

The United States Centre for Disease Control and Prevention (CDC) has defined Post Surgical Infections (PSSIs) as infection caused by an operative procedure at surgical incision within 30 days of the procedure or within 90 days if prosthetic material is implanted at operation. Although advances have been made in infection control practices, including improved theatre ventilation, sterilization methods, and proper use

of antimicrobial prophylaxis, PSSIs remain a leading cause of morbidity, prolonged admission, and death. PSSI is associated with a mortality rate of 3%^{2,3}.

Risk factors of developing PSSIs include the level of microbial contamination, age of the patients, duration of surgery and the presence of diabetes mellitus and obesity⁴. Many studies have shown the majority of bacteria causing PSSIs to be *S. aureus* and among gram negative bacilli: *E. coli*, *Klebsiella* and *Pseudomonas*⁵. They may include anaerobic bacteria⁶. There is an increase in incidence of PSSIs caused by antimicrobial resistant bacteria such as Methicillin Resistant *Staphylococcus aureus* (MRSA) and Vancomycin Resistant *Staphylococcus aureus* (VRSA)⁷.

An infected wound can prolong hospitalization by many days and subsequently increase medical costs⁸. The English Nosocomial Infection National Surveillance Scheme (NINSS) has stated that the overall incidence of PSSIs was 4.3% of all surgical operations, of which a quarter were serious deep or organ infections⁹.

Indications for antibiotic prophylaxis are contaminated and clean-contaminated surgery and operations involving artificial device and prosthetic material. To lesser extent are clean operations in patients with lack of immunity or patients in who involved in big operation as in ophthalmic surgery, open heart surgery and neurosurgery¹⁰.

METHODS

The study was performed at the Rizgary Teaching Hospital in Erbil/Iraq, a government teaching hospital which performs minor to major operations. A prospective study was performed on patients (160) admitted to Rizgary Teaching Hospital in Erbil. Most of the operations were elective. Data were collected over a period of six months between November 2015 to June 2016 from patients underwent surgeries. Data from each patient were collected according to a flow chart questionnaire developed for this purpose. These included name, age, duration of hospital stay, type of operation, and past medical history.

The incidence of PSSIs was estimated for each type of surgery and 30 days follow up since the day of the operation. The patients were postoperatively followed up in the Outpatient Department postoperatively and some of them were followed up by telephone interview for any signs and symptoms of infection. Also surveillance cards were given to the patients for feedback information. In addition notes written by some surgeons during the patients visits to the

clinics were also considered. The data recorded included date of admission, date of discharge, wound classification and comorbidities.

In patients who developed one of the clinical signs, a wound swab was obtained and sent to the Microbiology section for bacterial identification and for antibiotic sensitivity tests. Swabs were cultured on three plates: MacConkey agar, Blood agar, and Chocolate agar and incubated at 37° C for 24-48 hours according to the standard bacteriological method¹¹. After incubation, identification of bacteria from positive cultures was done which included studying the colonial morphology, Gram stain and biochemical reactions (catalase and coagulase tests for gram positive bacteria and oxidase test for gram negative bacteria). Further confirmation of the types of the bacteria and the antibiotic sensitivity pattern of all the isolates were performed using VITEK 2 systems.

The statistical package for social sciences (SPSS) version 19 software was used for data analysis. The 2-tailed chi-square test and Fisher exact test were used for categorical variables. Chi-square test and Student's t-test were used for continuous variables for the univariate comparison. A two-tailed $P < 0.005$ was considered as statistically significant.

RESULTS

The study sample was 160 patients, 58 males (36.2%) and 102 patients females (63.8%); the male to female ratio was 1:1.7. Among the 31 cases of PSSIs, there were 20 males (64.5%) and 11 females (35.5%). This relation between gender and PSSIs was statistically significant (P value = < 0.001).

The distribution of number of PSSIs among various age groups is shown in Table 1.

Table (1): Age groups and number of PSSIs.

Age group (Years)	Number of patients	Number and percentages of PSSIs	PSSI not present
11-25	25	4 (16%)	21 (84.0%)
26-40	70	14 (20%)	56 (80%)
41-55	45	7 (15.6%)	38 (84.4%)
56-80	20	6 (30%)	14 (70%)

There were 31 patients were having PSSI with an incidence rate of 19.4%. There were 20 cases of PSSIs with culture positive microorganisms

(64.5%). There were 6 cases of PSSIs (19.3%) among the total positive cases diagnosed according to clinical signs and symptoms but of

culture negative. In addition, there were 5 cases (16.2%), of PSSI diagnosed on basis of the surgeon's decision.

Table 2 shows that duration of the operation has direct effect on the occurrence of PSSIs and it was statistically significant (P value = < 0.001).

Table (2): Effects of duration of operation on the number of PSSIs.

Duration of operation	Number of patients	Number of PSSIs	P values = 0.001
< 60 min	110	13 (11.8%)	
< 90 min	37	13 (35.1%)	
< 120 min	9	03 (33.3%)	
>120 min	4	02 (50%)	

The day of admission has a direct effect on PSSIs, which was statistically significant (P value= < 0.001) as shown in table 3.

Table (3): Number of PSSIs in relation of days of stay in hospital.

Days at hospital	Number of patients	No. and % of PSSIs	P value= < 0.001
For 1 day	109	10 (9.2)	
2days	36	15 (41.7)	
>2 days	15	6 (40.0%)	

Regarding WBCs count, Blood sugar levels and BMI among the patients; both WBCs count and BMI had statistically significant association

P< 0.001 for PSSIs. However there was no statistically significant association with blood sugar.

Table (4): shows the effect of duration of antibiotic

Duration of AB prophylaxis	Number of patients	No and % of PSSIs	P value = < 0.001
1 Antibiotic for 1 week	85	20 (23.5%)	
2 Antibiotics for > 10 days	10	7 (70%)	
2 Antibiotics for 1 week	14	4 (28.6%)	
1 h before operation	24	0	
No antibiotics	27	0	

prophylaxis on the occurrence of PSSIs. There were no PSSIs in those patients who received antibiotic 1h before the operations compared to use of antibiotics 1 week and 10 days postoperatively. This was statistically significant (P value = < 0.001).

e 4 Effects of antibiotic prophylaxis on number of PSSIs

According to Southampton wound classification, 110 patients had clean wounds, 36 patients had clean-contaminated wounds, and 14 patients had contaminated wound. PSSIs was highest among the contaminated operations, and this was statistically highly significant (P value = < 0.001).

Table (5): Number of PSSIs regarding types of wounds.

Types of wounds	Number of patients	Number and % of SSIs	P value = < 0.001
Clean wounds	110	9 (8.2%)	
Clean contaminated	36	10 (27.8%)	
Contaminated	14	12 (85.7%)	

Table (6): Frequencies and percentages of pathogens isolated from PSSIs.

		Frequency	Percentage
Gram Negative	<i>E.coli</i>	7	29.2%
	<i>Pseudomonas aeruginosa</i>	2	08.3%
	<i>Klebsiella pneumoniae</i>	3	12.5%
	<i>Acinetobacter baumannii</i>	1	04.2%
Gram Positive	<i>Staphylococcus aureus</i>	5	20.8%
	<i>Streptococcus spp.</i>	1	04.2%
	<i>CON Staphylococcus</i>	3	12.5%
	<i>Enterococcus faecium</i>	2	08.3%

A total of 24 positive cultures were obtained from a total of 26 swabs, taken from clinically infected wounds. Single pathogens were isolated from (69%) of these swabs; while (8%) culture results grew mixed pathogens. In 6 of the culture results (23%), there were no pathogens isolated.

Escherichia coli were the most common species isolated from the cultures (table 6), accounting for 7 isolates (29.2%) of the total organisms isolated from the PSSIs. *Staphylococcus aureus* accounted for 5 isolates (20.8%) and both *Klebsiella species* and *CON Staphylococcus* had 3 strains (12.5%) while both *Pseudomonas aeruginosa* and *Enterococcus*

faecium had 2 isolates (8.3%) each. Lastly, both *Acinetobacter baumannii* and *Streptococcus spp.*

had only one positive strain (4.2%) for each.

The antibiotic resistant rate for *E. coli* (7 isolates) was 100% for Ampicillin, Augmentin, Piperacillin, Ticarcillin, Levofloxacin, Cefazolin, Ceftazidime, Ceftriaxone, Cefepime and Aztreonam. 85.5% resistance for Ciprofloxacin, 57% for Gentamicin, 50% Colistin, 29% Tazocin, Nitrofurantoin and Trimethoprim Sulfa and 14% for Amikacin. However the resistance was 0% for Imipeneme, Meropenem and Tigecyclin. This pattern was almost the same for the 2 isolates of *Klebsiella pneumoniae*.

Table (7): Frequencies (No.) and percentages of antibiotic resistance (R)

Antibiotic	Antibiotic Resistant			
	<i>E.coli</i> No. and R (%)	<i>Staphylococcus aureus</i> No. and R (%)	<i>Klebsella pneumonia</i> No. and R (%)	<i>CON staphylococcus</i> No. and R (%)
Benzylpenicillin		0/5 (0%)		0/2 (0%)
Gentamicin	4/7 (57.1%)	1/5 (20%)	2/2 (100.0%)	0/2 (0.00%)
Tobramycin	4/7 (57.1%)	2/5 (40.0%)	2/2 (100.0%)	0/2 (0.00%)
Ciproflaxacin	6/7 (85.8%)	1/5 (20.0 %)	0/2 (0.00%)	0/2 (0.00%)
Erythromycin		1/5 (20.0 %)		2/2 (100.0%)
Levoflaxacin	6/7 (85.8%)	1/5 (20.0 %)	0/2 (0.00%)	0/2 (0.00%)
Moxiflaxacin	6/7 (85.8%)	0/5 (0.00%)	0/2 (0.00%)	0/2 (0.00%)
Clindamycin		3/5 (60.0%)		2/2 (100.0%)
Linezolid		0/5 (0.00%)		0/2 (0.00%)
Teicoplanin		1/5 (20.0 %)		2/2 (100.0%)
Vancomycin		3/5 (60.0%)		2/2 (100.0%)
Tetracyclin		1/5 (20.0 %)		0/2 (0.00%)
Tigecyclin		0/5 (0.00%)		0/5 (0.00%)
Nitrofurantion	1/7 (14.2%)	0/5 (0.00%)	1/2 (50.0%)	0/2 (0.00%)
Fucidicacid		1/5 (20.0%)		0/2 (0.00%)
Fosmomycine		0/5 (0.00%)		0/2 (0.00%)
Rifampicin		2/5 (40.0%)		0/2 (0.00%)
Trimethioprim_Sulfa	4/7 (57.1%)	1/5 (20.0 %)	2/2 (100.0%)	0/2 (0.00%)
Oxacillin		3/5 (60.0%)		0/2 (0.00%)
Piparcillin/ tazobactam	4/7 (57.1%)		0/2 (0.00%)	
Amikacin	1/7 (14.2%)		0/2 (0.00%)	
Ertapenem	0/7 (0.00%)		0/2 (0.00%)	
Imepenem	0/7 (0.00%)		0/2 (0.00%)	
Meropenem	0/7 (0.00%)		0/2 (0.00%)	
Ampicillin	4/4 (100.0%)		0/2 (0.00%)	
Amoxillin_Clavulanic	4/4 (100.0%)		0/2 (0.00%)	
Ampicillin Sulbactam	4/5 (80.0%)		0/2 (0.00%)	
Piperacillin	4/4 (100.0%)		0/2 (0.00%)	
Colistin	2/2 (50.0%)		0/2 (0.00%)	
Ticarcillin	4/4 (100.0%)		0/2 (0.00%)	
Ticarcillin Clavulanate	4/4 (100.0%)		0/2 (0.00%)	
Cefazolin	4/4 (100.0%)		0/2 (0.00%)	
Ceftazidime	5/5 (100.0%)		0/2 (0.00%)	
Ceftriaxone	5/5 (100.0%)		0/2 (0.00%)	
Cefepim	5/5 (100.0%)		0/2 (0.00%)	
Aztreonam	5/5 (100.0%)		0/2 (0.00%)	

For *S. aureus* (5 isolates) rate of resistance was 100% for Levofloxacin, Tigecycline, Nitrofurantoin, Linezolid and Fucidic acid. 20% was for Gentamicine, Ciproflaxacin, Erythromycin, Teichoplanin, Tetracyclin and Trimethoprim sulfa. Was 40% for Tobramycin and Rifampicin. It was 60% Clindamycin, Vancomycin and oxacillin.

The two isolated strains of *Pseudomonous spp.* were sensitive Levofloxacin, Ciproflaxacin, Amikacin, Ampicillin Sulbactam, Linezolid, Vancomycin, Piperacillin-Tazobactam, Ceftazidime, Cefepime, Ceftriaxone, Imepenem, Meropenem, Gentamicin, Tobramycin; however, they were only Resistant to Trimethoprim-Sulfa (Table 7). **DISCUSSION**////////This study showed that male to female ratio was 1:1.7 which is in

agreement with other studies done in Iraq and in Iran^{12,13}. However, the ratio was contradictory to another study done in Saudi Arabia¹⁴. Regarding PSSIs, there were 20 males and 11 females among the total 31 cases of PSSIs and it was statistically significant (P value = < 0.001). The explanation for gender differences in PSSIs incidence rate resides in the differences between women and men's skin biology. Besides, the thicker and coarser male hair might cause a higher risk of infection¹⁴. The highest number of admitted patients (70) was among the age group (26-40) years and only 20 patients at age group (56-80) years (Table 1). This is similar to results of a study done in Saudi Arabia¹⁵. A study done in Egypt¹⁶ showed the highest number of patients was in the age group 41-65 years.

Among the total number of PSSIs (31), the highest percentage of PSSIs (30%) was among ages >56 (Table 1). This was statistically non-significant compared to other age groups (P value=0.559). Several earlier studies also indicated PSSIs rates were the highest among elderly patients^{15, 16, 17, 18, 19}. The differences between the various age groups and PSSIs may be due to the types and selection of the patients and operations in each study.

The incidence of PSSIs in this research was high (19.4%) which is nearly similar to the incidence rate Iran¹³ and Egypt¹⁶. Also, the incidence of African countries (from 1995-2010) shows 12%, 19%, and 16-31% for Algeria, Kenya, and Nigeria respectively²⁰. This incidence rate is higher than the average of 11.8% in developing countries¹⁹ and much higher than those for developed countries, as the incidence rates were 1.9% in the United States, 1.6 % in Germany, 1.4% in England, 1.6% in France and 2.0% in Portugal¹⁹. In another study the cumulative incidence of PSSIs ranged from 10.0% to 30.9% in low income countries. But the rate was 2.6% in the United States, and 3% in different European countries¹⁹.

The potential factors contributing to the high rate in this study may be attributed to the limited resources and powers allocated to infection control measures. There were no documented guidelines for safer surgery and proper antibiotic prophylaxis to prevent PSSIs. In addition, implementing post discharge surveillance was difficult because patients usually do not return to hospital for follow up and may return to private clinics or paramedics. In addition telephone follow

up has high specificity but low sensitivity. The surgeon's decision for follow up also has limited data and low specificity and sensitivity, because most surgeons are reluctant to give real incidence of PSSIs.

Regarding wound classification, the highest number of patients admitted to Rizgary Teaching Hospital was due to clean wound followed by clean-contaminated and the least were contaminated wounds. The infection rate was highest for contaminated wounds (64.2%) which is statistically highly significant (P value = < 0.001). These results were higher than the acceptable reported rates. In a study done in Pakistan, the percentages were 5.4%, 11.4%, and 20.0% respectively²¹, which are also a much higher than those percentages obtained in another study done in Iraq, whereby the rates were 3%, 6.25%, and 11% for clean, clean-contaminated, and contaminated wounds respectively⁶. This high percentages of PSSIs among contaminated wounds can be attributed first to abuse of antibiotic prophylaxis; second to the lengthy time of surgical operations, obesity, presence of past medical history, lack of infection control guidance and low nurse-to-patient ratio.

This research indicated that smoking had a significant association with PSSIs. Similar results were shown by other studies^{12, 13, 15, 17}. In addition past medical history (PMH) also had significant association with PSSIs, in particular hypertension. Other studies done in Iran¹³ Pakistan²¹ and Egypt¹⁶ also have shown similar outcome. Among other risk factors for PSSIs were wound contamination, duration of surgery and antibiotic prophylaxis. These results were consistent with other studies from other countries^{27, 28, 29, 30}. There was no statistical significant between high level of blood sugar and PSSIs. This may be due to good control of diabetes preoperatively which reduce the rate of PSSI. Other studies have shown an association between diabetes and PSSIs¹⁵ and the percentages of surgical patients with diabetes could be higher, depending on the type of surgery performed²⁶. There were 19 PSSIs among the patients with BMI > 24.9 kg/m² out of 77 with 24.67% compared to 14.5% among patients with BMI < 24.9 and this was statistically significant, as studies have shown similar results^{22,23,24,25,27}.

WBCs >11,000 had 90% association with PSSIs compared to 18.2% association with WBCs <11,000 and this was statistically significant. White blood cell counts in recently spinal surgery

could be a predictor for complications post-operation²⁷.

There was a statistically significant correlation between duration of operation and PSSIs (Table 4). It was 50% for operations lasted for > 2 hours which was the highest compared to < 1h. Studies done in Iraq, Iran, Saudi Arabia, Egypt, and developed countries had similar patterns^{13,15,16}.

Regarding the duration of hospital stay, there were higher numbers of PSSIs for patients staying for >48 hours in hospital compared to stay for < 48 hours and this was statistically significant $P = < 0.001$. This is in agreement with other studies^{12,13,15,19,33}.

Antibiotic prophylaxis had a highly statistically significant number of PSSIs when antibiotics were used for 1-2 weeks postoperatively compared to one dose of antibiotics given prophylactically one hour before induction of anaesthesia and also compared to those not given antibiotics at all in clean-wound operations. In a study carried out in Rizgary Teaching Hospital, it was found that intra-medication administration (within 1 hour before, and 24 hours after a surgical procedure) still accounts for a lower proportion of PSSIs relative to post-medication²⁸.

The appropriate prophylactic agent used in Rizgary Teaching Hospital was only 1.3%²⁸ whereas in India, it was 68%²⁹, Iran 5.9%³⁰, Jordan 1.7%³¹ and Turkey 68%³².

Escherichia coli were the commonest species isolated from the total cultures (29.2%), this is in agreement with 20 studies of abdominal surgery and a rate of 20.3%¹⁷. Another study in Saudi Arabia has shown that *Escherichia coli* was the most commonly isolated bacteria at a rate of 34.7%⁹. In addition, in China in 2010 reported that *Escherichia coli* had (25.9%), *Staphylococcus aureus* (14.3%), and *P. aureuginosa* (11.9%) and that these three organisms were the most common pathogens associated with PSSIs¹⁹. In contrast, a study conducted in India has reported that the most predominant isolate was *Staphylococcus aureus* (37%) of which 21.7% were MRSA. The possible cause for this difference is the smaller number of operations in the Indian study²⁹. Moreover, a study in Saudi Arabia has reported *S. aureus* as the commonest isolate, and more than one third were MRSA³⁴.

This difference in types of isolated bacteria depends on the operative site. *E. coli* and anaerobic organisms are frequent isolates following colorectal operations. However,

exogenous sources are less frequently implicated and include surgical personnel, the operation room environment, and surgical instrument³⁶.

The best means of preventing PSSIs is the perioperative administration of systemic antimicrobials²⁷. This is indicated if the risk of PSSIs is greater than that of a clean-contaminated procedure. However, there is evidence that clean procedures can benefit from antimicrobial prophylaxis^{35,36}.

Staphylococcus aureus still possess the high resistance to the commonly used antimicrobials in clinical practice. The average resistance rate of this species to Oxacillin was (60%) and to Vancomycin, (60%). This is a relatively higher percentage compared to a study by Reynolds R, *et al.* in which the resistance to Oxacillin was (42%)²⁷.

The high resistance of *E. coli* to Livofloxacin, Cefazolin, Ceftriaxone, Cefepim, Ceftazidime, Aztreonam demonstrates how the high usage of those antibiotics reflects the existence of ES β L among the isolates, and this is similar to pattern of resistance that was observed for *K. Pneumonia* with multiple antibiotic resistance. There was a less resistant pattern for *Ps. aeruginosa*. Meropenem, Imepenim, Ertapenem, and Amikacin were the most potent antibiotics which have high rate of sensitivity to all isolated organisms except for *Acinobacter baumannii*.

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پوخته

ئامانجه كان:

ئامانج له م تووژينه وهيه زانيني ژماره ي ئه و نه خووشانه ي كه له دواي نه شته رگهري توشي هه و كردني بريني نه شته رگهري ده بن ههروه ها دوزينه وه ي ئه و مه ترسيانه ي ده بنه هوكار ي دروسبووني نه خووشيه كه , بو ئه و نه خووشانه ي له نه خووشخانه ي رزگاري فيركاري /هه و لير ده خووترت , ههروه ها زانين و ناسينه وه ي جوكاره كان ي به كتريا و پشكنيني دزه ميكروؤب.

ريگاك (ههنگاو ههنگاو): (تووژينه وهيه كي پيشبيني كراو بو 160 نه خووش كراوه بو ئه و نه خووشانه ي ده خه و ينرين له نه خووشخانه ي رزگاري فيركاري /هه و لير بو مه به ستي نه شته رگهري له ماوه ي 8 مانگ (2016_6__2015-11) ههروه ها زانين و ناسينه وه ي جوكاره كان ي به كتريا و پشكنيني دزه ميكروؤب له ريگه ي به كارهياني. VITEK2 COMPACT. ئه نجام:

• ريژه ي تووشبووني هه و كردني بريني نه شته رگهري بريني بو له E.coli 19 % يه كيك بوو له زورترين ئه و به كتريانه ي كه ده رجوون له بريني دواي نه شته رگهري 29.2% . دواي ئه و 20.8% Staphylococcus aureus ههروه ها Klebsiella pneumoniae and Coagulase negative staphylococci ريژه يان بريني بوو له 12.5% بو هه ر يه كيكيان Pseudomonas aeruginosa و Enterococcus faecium ريژه يان بريني بوو له 8.3% بو هه ر يه كيكيان Acinetobacter baumannii and Streptococcus spp ريژه يان بريني بوو له 4.2% بو هه ر يه كيكيان E.coli , 100% به ركري هه بوو بو كروبي سييه مي سيفالوسپرين به لام 100% هه ستيار بوو بو Meropenem و Imipenem . ئه و هوكارانه ي له پشت تووشبوني هه و كردني برين بريني بوون له جگه ره كيشان , هه بووني نه خووشى دريژخايه ن , بريني نه شته رگهري پيس , زوري ماوه ي نه شته رگهري , ههروه ها خراب به كارهياني دزه به كتريا. ده رئه نجام:

ليره دا ده ركوت كه چه ندين بكتريا هه ن كه تواناي به رگريان بو دزه بكتريا زور به هيژه وه E.coli : و Staphylococcus aureus ههروه ها چه ندين هوكار هه ن بو په يدا بووني وه ك خراب به كارهياني دزه به كتريا پيش و دواي نه شته رگهري.

انواع البكتريا والعوامل المسببه للإلتهابات المكتسبة بعد العمليات الجراحية ومدى استجابتها للمضادات الحيوية في مستشفى رزكري التعليمي في مدينة أربيل - العراق.

الأهداف :

لايجاد نسب الإلتهابات المكتسبة بعد العمليات الجراحية في مستشفى رزكري التعليمي والتعرف على البكتريا المسببه ومدى استجابتها للمضادات الحيوية لها.

الطريقة:

تمت الدراسة على 160 مريض راقد في مستشفى رزكري خلال 8 أشهر من تشرين الثاني 2015 ولغاية حزيران 2016 وتم عزل البكتريا وزرعها وتشخيصها وكذلك معرفة نسبة مقاومتها للمضادات الحيوية البكتريا المسببه لها ونسب مقاومتها للمضادات الحيوية.

النتائج:

نسبة الاصابه بالإلتهابات الجراحية هي 19.4% *E. coli* كان أكثر نسبة 29.2% , وبعدها *Staphylococcus aureus* 20.8% , وكلا من *Coagulase Negative Staphylococci and Klebsiella pneumonia* بنسبة 12.5% المخاطر الملازمة للاصابة كان *Pseudomonas aeruginosa* و *Enterococcus faecium* 8.3% لكل منهما و *Acinetobacter baumannii* و *Streptococcus spp* كان فقط 4.2% لكل منهما, كان هناك مقاومة 100% من *E. coli* للجيل الثالث من السيفالوسبورين ولكن كانت حساسة 100% إلى *Imipenem* و *Meropenem* 60% من *Staphylococcus aureus* كانت مقاومة للأوكساسيلين , فكانت : التدخين, الامراض المزمنة, مدة العمليات الجراحية وسوء استخدام المضادات الحيوية.

الاستنتاج:

هناك بكتريا لا تستجيب لمعظم المضادات الحيوية وخاصة *Staphylococcus aureus* وكذلك *E. coli* وذلك لسوء استخدام المضادات الحيوية ولقلة الارشادات في استخدام المضادات الحيوية قبل العمليات وبعدها.