ORIGINAL ARTICLE

Frequency of Organisms Causing Surgical Site Infection in Gynecological & Obstetrics Patient

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ABSTRACT

Objective: To determine the frequency of common organisms causing surgical site infection in gynecological and obstetrics surgery patients.

Study Design: Cross-sectional

Place and Duration: Gynaecology and Obstetrics department of Abbasi Shaheed Hospital**,** Karachi for duration of six months from 1st April 2019 to 30th September 2019.

Methodology: A total of 128 women who underwent obstetric and gynecological surgery were enrolled in this study. Patients detailed demographics including age, body mass index, and parity were recorded after taking written consent. Wound swab was taken by the principal researcher under supervision and will be sent for the culture report. Data was analyzed by SPSS 24.0.

Results: Among 128 patients, mean age in our study was 42.27 ±10.54 years and mean BMI was 27.48 ±4.56. Frequency distribution of organism in surgical site infection showed that 74 (57.8%), 28 (21.9%), 12 (9.4%), 10 (7.8%) and 4 (3.1%) had staphylococcus aureus, klebsiella, pseudomonas aeroginosa, E coli and enterobacter. Stratification with age and parity showed no significant difference with p-value >0.05.

Conclusion: It is concluded that the prevalence of multi-drug resistant organisms were high. Staphylococcus aureus was the commoner's organism followed by klebsiella and pseudomonas aeroginosa.

Keywords: Surgical site infection, Wound infection, Organism, Antimicrobial, Sensitivity.

INTRODUCTION

Infection of a surgical site is one of the most common gynaecological complications.[1-3] We treat a number of surgical infections in each OPD. The aim of gynaecological and obstetrical surgeons has been the prevention of surgical infections. After both elective and emerging procedures, these infections are the leading cause of morbidity. Severe sequelae such as bacteremia, sperm shock, phlegmon, pelvic abscess, thrombophlebitis septic-pelvic, abscess wound and fascial dehiscence may exacerbate primary and devastating infections. A large number of risk factors, including increased age, high parity, diabetic obesity, hypertension, and many more, have been reported.[4-5]

Different type of organisms are responsible for these infections most commonly found is staph aureus 57.7% and others include E.Coli 33.3%, Pseudomonas 33.3%, Klebsiella 33.3%, Enterobacter 9.1% and many others.[6]

Several antibiotics are in use which include Co-amoxiclavulanic acid,2nd and 3rd generation cephalosporins, ciprofloxacin, imipenem, amikacin and many others usually started empirically and then changed according to the culture and sensitivity report or sometime continued if patients symptoms and clinical condition of the wound improves.[7-8]

In the present age of plethora of antibiotics, resistance of infecting bacteria is on step rise. This resistance and cost of further treatment including longer hospital stay and increased cost, putting extreme work burden on the surgeons and hospital reservoir. There is no doubt that the use of appropriate prophylactic antibiotic preoperatively is the best way to prevent infection. The antibiotic should be effective against the relevant bacteria of the site and appropriate dose of antibiotic is required to treat infection.[9-10]

We conducted present study with aimed to determine the frequency of organism causing surgical site infection in women underwent gynecological and obstetrics surgery.

MATERIALS AND METHODS

This cross-sectional study was conducted at Gynaecology and obstetrics department of Abbasi Shaheed Hospital**,** Karachi during from the for period of six months from 1st April 2019 to 30th September 2019. Total 128 women who have undergone gynecological and obstetrical surgery, who present with wound infection within 30 days of surgery were enrolled in this study. Patients ages were ranging from 20 to 60 years. Patients detailed demographics including age, BMI and parity were recorded after taking written consent. Patients operated other than our hospital, patients with surgical site infection after 30 days of surgery and immunocompromised patients for example AIDS, patient with malignancy, patient with chronic illness, patient on steroid, patient on cytotoxic drugs and radiotherapy were excluded from this study.

Wound swab was taken by the principal researcher and sent for the culture and sensitivity report to the institutional laboratory and organisms detected were labeled. All the data was analyzed by SPSS 24.0. Demographic data is presented as simple descriptive statistics giving mean and standard deviation for age and BMI. Qualitative variables like parity and organisms (like

staphylococcus aureus, enterobacter, pseudomonas, klebsiella and E coli) causing surgical site infection are presented as frequency and percentages. Effect modifiers are controlled through stratification of age see the effect of these on the outcome. Poststratification chi square test was applied and P value of ≤0.05 was taken as significant.

RESULTS

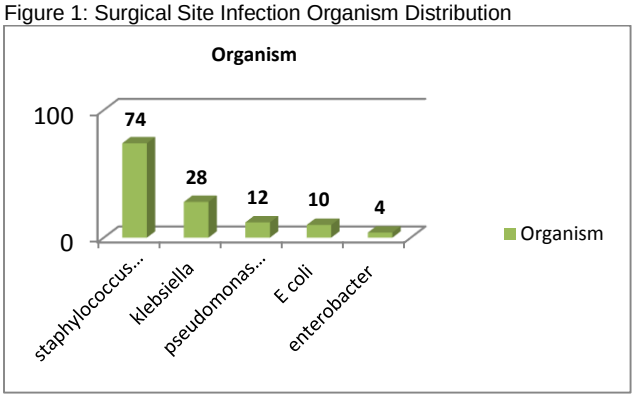
Out of 128 patients minimum age of the patient was 21 while maximum age of the patients was 59 years. 24 (18.8%) patients were in age group 20-30 years, 22 (17.2%) patients were in age group 31-40 years, 45 (35.2%) patients were in age group 41-50 years and 37 (28.9%) patients were in age group 51-60 years. Mean age in our study was 42.27±10.54 years. Mean BMI in our study was 27.48±4.56 kg/m^2. Frequency distribution of parity showed that out of 128 patients, 17 (13.3%), 20 (15.6%), 34 (26.6%), 57 (44.5%) patients were in parity group 0-1, 2, 3 and >4. (Table 1)

Table 1: Baseline characteristics of all the included patients

Variables	Frequency No.	%
Mean BMI (kg/m)	27.48±4.56	-
Mean age (yrs)	42.27±10.54	-
Age (Years)		
20 to 30	24	18.8
31 to 40	22	17.2
41 to 50	45	35.2
51 to 60	37	28.9
Parity		
0-1	17	13.33
2	20	15.6
3	34	26.6
≥4	57	44.5

Frequency distribution of organism in surgical site infection showed that out of 128 patients, 74 (57.8%), 28 (21.9%), 12 (9.4%), 10 (7.8%) and 4 (3.1%) had staphylococcus aureus, klebsiella, pseudomonas aeroginosa, E coli and enterobacter respectively. As presented in Figure 1.

Figure 1: Surgical Site Infection Organism Distribution



Stratification for age with respect to organism in surgical site infection showed that 16 (66.7%), 11 (50%), 27 (60%) and 20 (54.1%) had staphylococcus aureus in the age group 20-30, 31-40, 41-50 and 51-60 respectively. Whereas 3 (12.5%), 7 (31.8%), 10 (22.2%) and 8 (21.6%) had klebsiella in the age group 20-30, 31-40, 41-50 and 51-60 respectively. Furthermore, 2 (8.3%), 1 (4.5%), 4 (8.9%) and 5 (13.5%) had pseudomonas in the age group 20-30, 31-40, 41-50 and 51-60 respectively. 2 (8.3%), 2 (9.1%), 4 (8.9%) and 2 (5.4%) had E coli in the age group 20-30, 31-40, 41-50 and 51-60 respectively. Moreover, enterobacter was found in 1 (4.2%), 1 (4.5%), 0 (0%) and 2 (5.4%) in the age group 20-30, 31-40, 41-50 and 51-60 respectively. P value was 0.88.(not significant). As presented in Table 2.

Table 2: Stratification of organism with age

Age (Years)	Staph. Aureus	Klebsiella	Pseudomonas	E Coli	Enterobacter	Total
20-30	16(66.7%)	3(12.5%)	2(8.3%)	2(8.3%)	1(4.2%)	24(100%)
31-40	11(50%)	7(31.8%)	1(4.5%)	2(9.1%)	1(4.5%)	22(100%)
41-50	27(60%)	10(22.2%)	4(8.9%)	4(8.9%)	0(0%)	45(100%)
51-60	0(54.1%)	8(21.6%)	5(13.5%)	2(5.4%)	2(5.4%)	37(100%)
TOTAL	4(57.8%)	28(21.9%)	12(9.4%)	10(7.8%)	4(3.1%)	128(100%)

P-value 0.88

DISCUSSION

We studied 128 patients who underwent surgery in Gynae and Obs Dept of Abbasi Shaheed hospital, Karachi were evaluated for the frequency of common infecting organisms. Mean age was 42.27 ±10.54 and mean BMI 27.78±4.56.

Makanjuola et al. in the study conducted at federal medical centre Nigeria, Bacterial isolates of one hundred and sixty (160) have been recuperated from surgical site infection sample culture. Escherichia coli, 52, was the predominant organism (32.5 percent). Others included Staphylococcus aureus 46 (28.75%; Pseudomonas aeruginosa 26 (16.25%); proteus 18(11.25%); Klebsiella 14(8.75%); Enterococcus (1.25%); and Streptococcus α-haemolytic (1.25 percent). Obstetrics and gynaecology were most often associated with SSIs. At the extremes of ages, bacterial growth was 100%. [11]

Mulu et al. found that 10.9% of 294 sterile and clean operating patients had bacterial nosocomial infections reported in the Felegehiwot referral hospital in Ethiopia. There were a total of 42 bacterial pathogens, including S. Aureus accounted for 26.2% of the leading isolates, then E. Negative Staphylococcus coli and coagulase per species 21.4%. Almost 100% positive gramme and 95% negative gramme negative bacterial isolates is immune to two or more anti-microbial medicines[12].

Jido et al. found that out of the 44 SSI cases, 32 (72.7%) have been injured by swab crops, 36.8%) have produced no growth from the study conducted in Kano, Nigeria. Staphylococcus aureus was grown in 14 (31.8 per cent), while E was grown in 13.6 per cent. Coli,

Pseudomonas spp 6.8 percent. And for Salmonella and Morganella morganii, 2.3 percent respectively. [13]

Ali et al. found that 112 pus culture and sensitivity records were examined during the analysis in a tertiary care hospital in Abbottabad, Ayub Medical University. E. The most common isolated organism followed by Klebsiella 23 was coli 68 (60,7 percent) (20.5 percent). Staph was the least common organism. Squamous Disease 1 (0.9%).[14]

In my study frequency distribution of organism showed that staphylococcus aureus (57.8%), klebsiella (21.9%) , pseudomonas aeroginosa(9.4%) , E coli (7.8%) , enterobacter (3.1%).

Many of studies including my study shows almost similar pattern of organism involved in SSI. The commonest is staphylococcus aureus.[15-16]

This study gives us an insight to the current state of causative pathogens surgical site infections in our hospital. We suggest that surgeon, pharmacist, epidemiologist and microbiologist, to take their local infecting organism/sensitivity pattern into account when formulating prophylaxis as well as empirical therapy guideline for individual surgical site. We also suggest that the chosen antibiotic must have antimicrobial susceptibility for the common prevalent stains of micro-organisms.

CONCLUSIONS

This research provides us with an insight into the current state and pattern of causative pathogens. In addition to antibiotic policy based on a susceptibility profile of an infectious agent, the high prevalence of multidroge-resistant organisms causing SSIs is very significant, a good marker for hospital-related infections . Prevention by means of sufficient infection control, ensuring the correct preparation and maintenance of the operating room.

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