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Original Research

To evaluate the incidence and associated co morbidities due to surgical site wound infection

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ABSTRACT:

Aims and objectives: The aim of the present to evaluate the incidence and associated comorbidities which influence the surgical site wound infection. **Material and methods:** The study was a cross sectional study which was carried in the Department of microbiology. Using sterile cotton swabs, two pus swabs/ wound swabs were collected aseptically from each patient suspected of having SSI. Gram stained preparations were made from one swab for provisional diagnosis. The other swab was inoculated on nutrient agar, 5% sheep blood agar (BA) and MacConkey agar (MA) plates and incubated at 37°C for 24-48 hours before being reported as sterile. Growth on culture plates was identified by its colony characters and the battery of standard biochemical tests. All the isolates were tested for antimicrobial susceptibility by Kirby Bauer disk diffusion technique on Muller Hinton Agar. **Results:** Out of 250 samples, 100 samples were culture positive (40%). Among 100 positive samples 55(55%) were males. The age wise distribution of the gender has been shown in the with maximum no. of culture positive samples in age 20-30 years (32%) followed by 30-40 (17 %) and then followed by 40-50 (16%) of age group respectively. Out of 100 cultures positive samples Escherichia coli. 27(27%) was the most common pathogen isolated followed by S.aureus 25 (25%), Citrobacter spp. 16(16%) and Klebsiella spp 9(9%), Pseudomonas aeruginosa 8(8%), Enterobacter spp. 6(6%), CONS 6(6%), Acinetobacter spp 2(2%) and Proteus spp. 2(2%) respectively. **Conclusion:** It has been concluded that wound infections in this were polymicrobic in nature and, in most cases, associated with S. aureus, E.coli and Pseudomonas aeruginosa.

Key words: wound infection, surgical site infection, S.aureus

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INTRODUCTION

Contamination is the attack of the body by infection bringing about pathogen that get to be set up, increase in the body and in this way deliver side effects.[1] On the off chance that such pathogens defile and colonize the injury then twisted contamination is brought on. Wound contamination is characterized as the arrangement of discharge in an injury, and in addition other general or neighborhood components of sepsis including pyrexia, torment and in terms.[2] Wound diseases represent 70-80% death rate.[3] Wound may be countered in clinical practice either postoperatively, taking after injury, or could principally be of infective birthplace.[4] Despite their starting point, all injuries may debased by microorganisms or outside bodies or both.[5] Wound tainting sources incorporate : (i) nature (exogenous microorganisms noticeable all around or those presented by traumatic damage), (ii) the encompassing skin (including individuals from the ordinary skin microflora, for example, Staphylococcus epidermidis, micrococci, skin diphtheroids, and propionibacteria), and (iii) endogenous sources including mucous layers (fundamentally the gastrointestinal, oropharyngeal, and genitourinary mucosae).[6] The part and essentialness of microorganisms in wound mending has been bantered for a long time, a few specialists consider the microbial thickness to be basic in anticipating wound recuperating and disease While others consider the sorts of microorganisms to be of more prominent hugeness. Albeit wound contaminations are brought on by microorganisms, broad debate still exists with respect to the system by which they cause disease. The greater part of open injury colonization is

polymicrobial[7-9] including various microorganisms that are potentially pathogenic. However twisted consideration experts considered that high-impact or facultative pathogens, for example, Staphylococcus aureus, Pseudomonas aeruginosa, and beta-hemolytic streptococci and discharge framing pathogens like Enterococci sp, Escherichia coli, Klebsiella sp. also, Proteus sp[10] are the essential drivers of postponed recuperating and disease in both intense and constant injuries. As indicated by a writing anaerobic microorganisms include, 33% of the aggregate number of microbial species in colonized injuries, and their number increments to around half in contaminated injuries. Consequently, antimicrobial treatment of clinically tainted injuries ought not just target particular pathogens that are normally thought to be the causative specialists (e.g., S. aureus and P. aeruginosa) however ought to cover an assortment of conceivably synergistic oxygen consuming or facultative and anaerobic microorganisms. For instance alone metronidazole or clindamycin cover just the anaerobic parts, in this manner show Poor achievement rates.[11] Blend treatment with an aminoglycoside (e.g., gentamicin) or a cephalosporin (e.g., cefuroxime or cefotaxime) in addition to clindamycin or metronidazole has turned out to be extremely compelling. Since S. aureus is thought to be the most widely recognized pathogen included in contaminated injuries[12,13] cephalosporins, macrolides, clindamycin, and semisynthetic penicillin's, for example, flucloxacillin and oxacillin are generally medicines of decision.[12] On the off chance that strains of MRSA are included, the glycopeptide anti-toxins vancomycin and teicoplanin are elective decisions. Henceforth the treatment of contamination is required to pick the right sort of anti-toxins and the fitting fixations to be utilized, thinking seriously about the etiology of the disease and the span of the anti-microbial treatment to avert anti-toxin resistance.[14] The aim of the present A study to assess the incidence and associated comorbidities which influence the surgical site wound infection.

MATERIAL AND METHODS

The study was a cross sectional study which was carried in the Department of microbiology, after taking the approval of the protocol review committee and institutional ethics committee. Total 250 patients with SSIs either sex or any age, who had surgical wound pus, discharge, or signs of sepsis were include in this study. Patients with cellulitis and suture abscess were exclude from this study.

Using sterile cotton swabs, two pus swabs/ wound swabs were collected aseptically from each patient suspected of having SSI. Gram stained preparations were made from one swab for provisional diagnosis. The other swab was inoculated on nutrient agar, 5% sheep blood agar (BA) and MacConkey agar (MA) plates and incubated at 37°C for 24-48 hours before being reported as sterile. Growth on culture plates was identified by its colony characters and the battery of standard biochemical tests.[15,16] All dehydrated media, reagents were procured from Hi Media Laboratories Pvt. Ltd., Mumbai, India.

Statistical Analysis: Data was entered in Microsoft excel spreadsheet and analysed using appropriate statistical software application.

RESULTS

Out of 250 samples, 100 samples were culture positive (40%) (Table1). Among 100 positive samples 55(55%) were males (Table 1). The age wise distribution of the gender has been shown in the (Table 2) with maximum no. of culture positive samples in age 20-30 years (32%) followed by 30-40 (17 %) and then followed by 40-50 (16%) of age group respectively. Out of 100 cultures positive samples Escherichia coli. 27(27%) was the most common pathogen isolated followed by S.aureus 25 (25%), Citrobacter spp. 16(16%) and Klebsiella spp 9(9%), Pseudomonas aeruginosa 8(8%), Enterobacter spp. 6(6%), CONS 6(6%), Acinetobacter spp 2(2%) and Proteus spp. 2(2%) respectively (Table 3).

Table-1: Sex distribution of Culture positive Patients

Sex	No of patients=100	Percentage
Male	55	55
Female	45	45

Table-2: Age wise Distribution of Culture Positive Patients

Age in year	Culture Positive	Percentage
Below 20	14	14
20-30	32	32
30-40	17	17
40-50	16	16
50-60	13	13
Above 60	8	8

Table-3: Distribution of Organisms Causing Surgical Site Infection

Organism	No. of isolates (%)	Percentage
Escherichia coli	27	27

Staphylococcus aureus	25	25
Citrobacter spp.	16	16
Klebsiella spp.	9	9
Pseudomonas aeruginosa	8	8
Enterobacter spp.	6	6
CONS	5	5
Proteus spp.	2	2
Acinetobacter spp.	2	2

DISCUSSION

From a microbiological perspective, the primary function of normal, intact skin is to control microbial populations that live on the skin surface and to prevent underlying tissue from becoming colonized and invaded by potential pathogens. Exposure of subcutaneous tissue following a loss of skin integrity (i.e., a wound) provides a moist, warm, and nutritious environment that is conducive to microbial colonization and proliferation. However, the abundance and diversity of microorganisms in any wound will be influenced by factors such as wound type, depth, location, and quality, the level of tissue perfusion, and the antimicrobial efficacy of the host immune response. Whereas the microflora associated with clean, surgical wounds would be expected to be minimal, the presence of foreign material and devitalized tissue in a traumatic wound is likely to facilitate microbial proliferation unless early prophylactic antibiotic treatment and surgical debridement is implemented.[17]

Out of 250 samples, 100 samples were culture positive (40%). Whereas various other studies from India have shown the rate of SSI to vary from 6.1% to 38.7%.[18-21] The main Reason behind may be due to the lack of attention towards the infection control measures, inappropriate hand hygiene practices and overcrowded hospitals. In our study, it was observed that rate of infection was higher in male patients (55%). The results were similar to a study by Vikrant Negi et al, who reported that (74.6%) males were more commonly affected than females (25.5%).[22] In contrast to our study Gangania P et al reveals that 20% Females shows almost equal distribution of 19% of males.[23] The findings in the study revealed that maximum no. of culture positive samples in age 20-30 years (32%) followed by 30-40 (17 %) and then followed by 40-50 (16%) of age group respectively. Similar results was showed by Pooja Singh Gangania who concluded that maximum no of SSI was in 16-45years of age group (24%) patient. This may be due to heavy work load, stress at this age group and less number of patients.[23] Escherichia coli. 27(27%) was the most common pathogen isolated followed by S.aureus 25 (25%). This result is consistent with reports from other studies SP Lilani, Mulu W.[19,24] S. aureus infection is most likely associated with endogenous source as it is a member of the skin and nasal flora and also with contamination from environment, surgical instruments or from hands of health care workers.[22] There is also debate about whether a wound should be sampled for culture, the value of wound sampling in determining the cause of infection and subsequent treatment, and the sampling technique required to provide the most meaningful data. Regarding the role of the microbiology laboratory, consideration must be given to the relevance of culturing polymicrobial specimens, the value of identifying one or more microorganisms, and which microorganisms (if any) should be assayed for antibiotic susceptibility. By questioning and justifying the need to sample and perform microbiological analyses on any problematic wound, long-term savings in cost, labor, and time to both the wound management team and the microbiology laboratory could be considerable. In this respect, the value of the Gram stain as a quick and inexpensive additional or alternative test is also worthy of consideration.

CONCLUSION

It has been concluded that wound infections in this were polymicrobic in nature and, in most cases, associated with S. aureus, E.coli and Pseudomonas aeruginosa. A continuous inspection should be carried out to monitor the susceptibility of these pathogens and chose appropriate regimens both for prophylaxis and treatment of surgical wound infections. consistent dialogue between the microbiology department and the surgeons is strongly cautioned in keeping with preventing and controlling surgical wound infections at little cost.

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