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Original Research Paper

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ISOLATION AND IDENTIFICATION OF BACTERIA FROM A PUS SAMPLE COLLECTED AT BULDHANA GOVERNMENT HOSPITAL, DISTRICT BULDHANA.

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ABSTRACT The presence study was to examine the prevalence and distribution of bacteria isolated from pus or wounds, along with their susceptibility profiles. The identification of bacterial isolates was carried out using conventional microbiological methods. A microbiological study was conducted to analyze 60 pus samples collect from Government hospital, Buldhana and 40 collect from other hospitals. The sample collects and transfers to the P.G. Department of Microbiology, Shri Shivaji Science and Arts College, Chikhli for further study. For the isolation and identification different material and methods are used. The most common pathogen was Staphylococcus aureus, near about 50% of isolates and remaining are such as Klebsiella species at 22 %, Pseudomonas species at 16% and Escherichia coli at 12%. Strict health policies need to be established to control the purchasing and prescribing of antibiotics, prevent their unsupervised use, and ensure ongoing monitoring and reporting of antibiotic resistance.

KEYWORDS : Staphylococcus aureus, Klebsiella species, Pseudomonas species and Escherichia coli.

INTRODUCTION

Pus is a collection of thick, white or yellow fluid, formed at the site of inflammation during infection. It is made up of dead tissue, white blood cells, and damaged cells (Kulandhaivel *et al.,* 2017). Most common organisms causing pyogenic infection includes gram positive cocci such as Staphylococcus aureus, Staphylococcus epidermidis, Enterococcus spp and gram negative bacilli such as Pseudomonas aeruginosa, Klebsiella spp, E. coli.(N Bankar *et al*., 2018 and WWC Topley *et al*., 2007). Pyogenic infection are characterized by local and systemic inflammation with pus formation. Infection of soft tissue are generally associated with the production of pus and bacteria involved are said to be pyogenic (pus producing). Wide variety of aerobic and anaerobic species of bacteria may be present either singly or in combination in infection of wounds and soft tissue. Some infection resolve without specific therapy but some infection especially mixed infection can cause severe synergic therapy (Koneman, W.K. *et al.,* 2005). The skin barrier is disrupted by every skin incision and microbial contamination is unavoidable inspire of the best skin preparation. Furthermore, irrespective of the technological advances in surgery and wound management, wound infection has been regarded as the most common nosocomial infection particularly among patients undergoing surgery (Moyo S. Aboud S, *et al.,* 2010) Wound infection results in prolonged hospital stay and increased trauma care and treatment costs (Lyamuya *et al*., 2011). Wound infections were considered as the most serious burden for patients and health care people, particularly in nosocomial settings. The probability of wound infections largely depends on the host defenses, local wound conditions and microbial burden. Urinary tract infection is reported to be highest (42 to 50%), followed by wound infection (10 to 33%) and respiratory tract infection (10.5%) in India (Basu, *et al*., 2009).

These infections complicate illness, because anxiety, increase patient discomfort, delayed healing and can lead to death. The occurrence of a postoperative infection is dependent upon the interaction of patient- or host-related factors, such as host immunity, nutritional status, comorbid conditions; procedure-related factors, including the presence of foreign bodies and tissue trauma associated with the procedure, microbial properties such as ability to adhere to tissue or foreign bodiesand innate virulence, and appropriate and timely antimicrobial prophylaxis (NwachukwuNC, *et al*., 2007).

MATERIAL AND METHOD

Total 100 samples of wound infection collected from sample of government hospital in Buldhana, & other samples in hospital of Chikhli. Samples were collected in the sterilized cotton-tipped swab sticks in 9 ml nutrient broth in test tube. These all-test tube in containers and they were labeled with place, and name. The appearance of a specimen of pus and that of any appreciable amount of pus on a swab was observed (Koneman *et al.,* 2005). These containers were transferred to research laboratory of the Shri Shivaji Arts, Science and Commerce Senior College, Chikhli for subsequent analysis. The samples were analyzed within the 1 to 3 days of the collection of samples.

The pus specimen was inoculated on blood agar plates, MacConkey agar plates and EMB agar plates. The streaked plates were incubated at 37°C for 24 hr. Bacterial colonies on blood agar plates were later Gram stained. Characterization of bacterial isolates was based on standard microbiological methods. Identification of isolates were done based on colony morphology, motility, catalase test, oxidase test, coagulase test and biochemical tests like Tripal sugar iron agar, Hydrogen sulfide test, Carbohydrate fermentation test, Phenylalanine deaminase test, Methyl red test, Nitrate reduction test, Urease test, Voges proskauer, Citrate utilization test, Indole test (Koneman *et al.,* 2005).

RESULTS AND DISCUSSION

On the basis of observations we found the isolates such as *Staphylococcus aureus*, near about 50% of isolates and remaining are such as *Klebsiella* species at 22 %, Pseudomonas species at 16% and Escherichia coli at 12%. The *Staphylococci aureus* were the predominant Gram positive organism (50%) because since these bacteria are found globally in various environments, the family Enterobacteriaceae comprised 60% of all isolates identified. Bacterial isolates identified as *Escherichia coli* accounted for only 12% of the total number of isolates and others are *Klebsiella* species was 22 %, Pseudomonas species was 16% in the all collected samples. All the isolates are confirmed by microbiological methods. The microbiological analysis reveals that *S. aureus* is the leading etiologic agent of infection in these health institutions. (Emele *et al.,* 1999; Mashita *et al.,* 2000). Also compare results with Poonam Verma 2012, A total of one hundred and sixteen bacterial isolates were obtained from different cultures. In 86 cases, cultures were monomicrobial, 16 cultures were polymicrobial but no bacterial isolate was obtained in 149 cases. *Staphylococcus aureus* was the predominant microorganism (40%) followed by *Klebsiella sp*. (33%), *Pseudomonas sp*.

(18%), *Escherichia coli* (16%), and *Proteus sp.* (7%). *S. aureus* was the most frequently isolated microorganism from pus caused by incision to reach pus or fluid collection under the skin surface and from wound types observed in this study. Microbiological investigations have noted that this organism is the single causative bacterium in approximately 25 to 69% of cutaneous abscess (Mahdi *et al.,* 2000). Pus infection has been a major concern among health care practitioners not only in terms of increased trauma to the patient but also in view of its burden on financial resources and the increasing requirement for costeffective management within the health care system (Alexander, 1994).

CONCLUSION

The study revealed that Staphylococcus aureus was the most frequently isolated organism from pus cultures, followed by *Klebsiella, Pseudomonas, Proteus* and *E. coli*. In conclusion, Gram-positive bacteria were found to be more prevalent than Gram-negative bacteria in the pus samples analyzed. The diversity of organisms identified highlights the importance of collecting culture specimens from infected wounds for microbiological analysis and antibiotic susceptibility testing, which enables tailored chemotherapy. Although our study did not examine the role of hygiene in wound infections, we recommend that educating patients about personal hygiene could significantly improve wound healing and patient management.

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