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Research Article

**PREVALENCE OF PSEUDOMONAS AERUGINOSA IN
POSTOPERATIVE INFECTIONS OF WOUND**¹Dr Ayman Laraib, ¹Dr Jamshaid Ur Rehman, ²Dr Ayesha Ejaz

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ABSTRACT:

Objective: The aim of this research work is to find out the occurrence of PA (*Pseudomonas Aeruginosa*) in the infections of postoperative wound.

Methodology: We collected the swab specimens from the patients who underwent surgery from basins, sinks, floors and staff of nursing from various wards of the Allied / DHQ Hospital Faisalabad. We processed all these samples in the Microbiology department of the same hospital for the evaluation of the PA as a factor of NI (Nosocomial Infections).

Results: Among eighty isolates of bacteria available in the postoperative infection of wound, 33.30% (n: 20) were PA, followed by SA (*Staphylococcus Aureus*) as 21.70% (n: 13), Species of *Klebsiella* were present in 16.70% (n: 10), *Escherichia coli* was present in 11.70% (n: 7), Atypical coliform was present in 6.70% (n: 4), *Proteus* species found in 6.70% (n: 4), *Streptococcus pyogenes* was available in 1.70% (n: 1) & *Enterococcus faecalis* I was present in only 1.70% (n: 1). The prevalence of infection of PA was greater in females in comparison with males with a ratio of 3:2 & it was more prevalent in young patients in comparison with the elder ones. In vitro pattern of sensitivity of twenty isolates of PA displayed colistin as 100.0%, gentamicin as 75.0%, streptomycin as 30.0% & tetracycline 10.0%.

Conclusion: The occurrence of PA is very high in the postoperative infections of wound. This problem can be tackled with obtaining more hygienic activities for the decrease of the nosocomial infection among patients who underwent surgery.

KEY WORDS: Surgery, Pyogens, Atypical Coliform, Streptococcus, Postoperative, Bacteria.

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INTRODUCTION:

Postoperative infection of wound means infection after surgical intervention [1]. The frequency of the prevalence of postoperative infection of wound differs from hospital to other hospital [2]. It is clear that the infections of surgical wounds may present shortly after the operation or many days after surgical intervention & that the exact location of the infection may be the suture line or it may get extension to the surgical site [1, 2]. Maniatis [3] proposed that sepsis with deep root developing some days postoperative & prior to the dressing show an infection of theater. The infections of the ward are highly superficial and commonly follow the dressing of the surgical wounds in wards. In the same manner, the infections of the skin like boils or abscesses appearing at the locations other than the location of the surgery show that the development of the infection carried out in the ward [2, 3]. The densities of the microbes of one hundred and five or more organisms frequently show infection with fewer count showing the contamination [4]. The research works on bacteriology showed that postoperative infection of wound is a universal issue & the types of the bacteria changes with the location of geography. Bacteria normally spread on skin, the clothing near the location of wound & duration between the examination and wound onset [4, 5]. Within current few years, there is an increasing prevalence of the gram negative microbes as basic reasons of the severe complications or infections as present in different health care institutes.

These microbes have nearly changed *S. aureus* in NI. Among the gram negative bacilli, there is special interest towards PA [6]. The occurrence of the PA in postoperative infection of the wound is a problem of severe nature in the countries which are under development due to the relaxation in the normal hygienic cares, high formation of the antiseptic with very low quality & low quality medicines for therapy, complications in suitable definition of responsibility among professional staff of the hospital [7]. This is the observation that healthy carriers of PA in the environment of the hospital are responsible for about 28.0% whereas very less in the normal population [8].

METHODOLOGY:

We collected the postoperative wound specimens (swabs) aseptically with the help of sterile wool from various departments of the hospital. Various media which are in use in this research work are method of blood agar, MacConkey agar test, cetrimide agar method, chocolate agar test, nutrient agar & slopes, peptone water & Simmon citrate agar test method. We prepared the media in accordance with the guidelines of the manufacturers. Various reagents & media utilized for biochemical testing contained oxidase reagent, Simmon citrate, indole reagent, glucose, and Kigleriron agar & indole urea motility. The finding's presentation carried out with the help of the standard procedures [9].

The established method of the treatment for the swabs of wound were in use for the bacteriological examinations [9]. The preparation of the gram stain performed for every swabs. We incubated the plates at three hundred and seventy centigrade for 18 to 24 hours in incubator. We read the plates at following day and extended to forty-eight hours if we found no growth in twenty-four hours. Then, we carried out the gram staining procedure & biochemical testing for discovery. We carried out the identification of the PA & other isolates of bacteria based on the presentation of the bacteria. Then, we conducted the antibiotic sensitivity testing on the available isolates & then the identification of the colonies of the PA carried out with the utilization of the Kirby-Bauer procedure. We used the standard strains for the testing of the all the methods used in this research work.

RESULTS:

We collected the eighty samples in which sixty samples were from surgical, pediatric, orthopedic & gynecology wards. We obtained 12 specimens from basins, sinks, floor & 8 specimens from the staff of nursing. Table-1 displays the incidence of PA & other isolates of bacteria from the postoperative infection of wound.

Table-I: Occurrence of Bacterial Isolates in Post-Operative Wound Infection

Pathogens	Total Number Isolated	Isolates
<i>Pseudomonas aeruginosa</i>	20.0	33.300%
<i>Staphylococcus aureus</i>	13.0	21.700%
<i>Klebsiella species</i>	10.0	16.700%
<i>Escherichia coli</i>	7.0	11.700%
Atypical coliform	4.0	6.700%
<i>Proteus species</i>	4.0	6.700%
<i>Streptococcus pyogenes</i>	1.0	1.700%
<i>Enterococcus faecalis</i>	1.0	1.700%
Total	60.0	100.000%

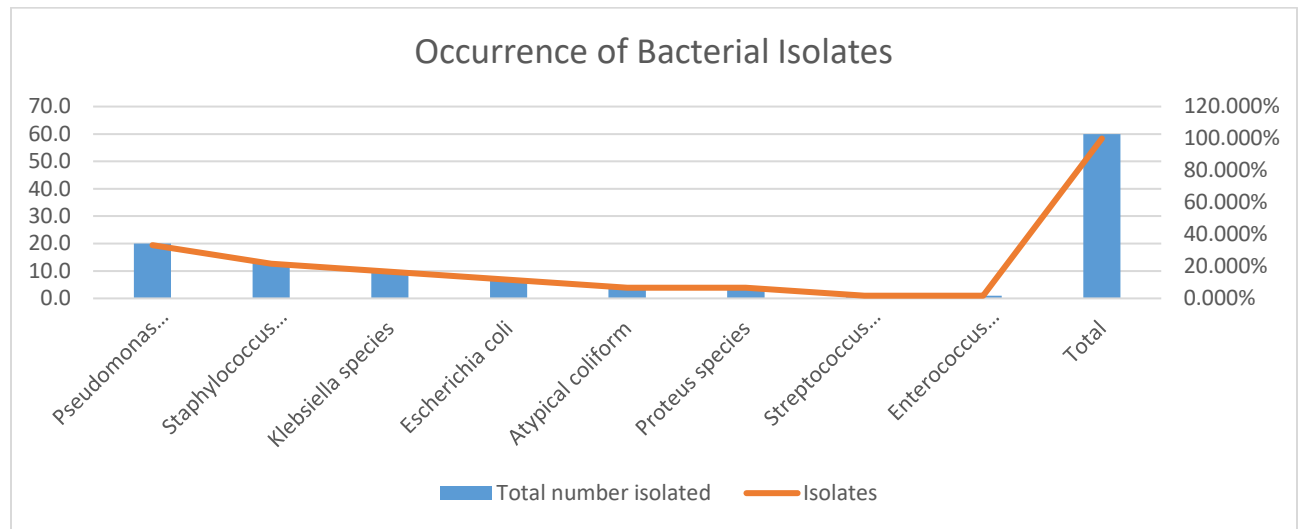


Table-2 displays the surgery type, quantity & percentage of the prevalence of PA separated in each surgery.

Table-II: Occurrence of Pseudomonas Aeruginosa in Post-Operative Infection as Seen in Different Types of Operation (n=20)

Type of operation	P.aeruginosa	
	No	%
Mastectomy	3.0	15.00
Laparotomy	1.0	5.00
Appendectomy	1.0	5.00
Pyloromyotomy	1.0	5.00
Haemorrhoidectomy	1.0	5.00
Myomectomy	1.0	5.00
Cystolithotomy	1.0	5.00
Colostomy	2.0	10.00
Prostatectomy	0.0	0.00
Gastrojejunostomy	0.0	0.00
Cystostomy	0.0	0.00
Thyroidectomy	0.0	0.00
Gastrectomy	0.0	0.00
Thoracotomy	2.0	10.00
Caesarean section (C/S)	5.0	25.00
Cholecystectomy	2.0	10.00
Pyloromyotomy	0.0	0.00
Herniotomy	0.0	0.00
Urethroplasty	0.0	0.00
Osteotomy	0.0	0.00
Total	20.0	100.00

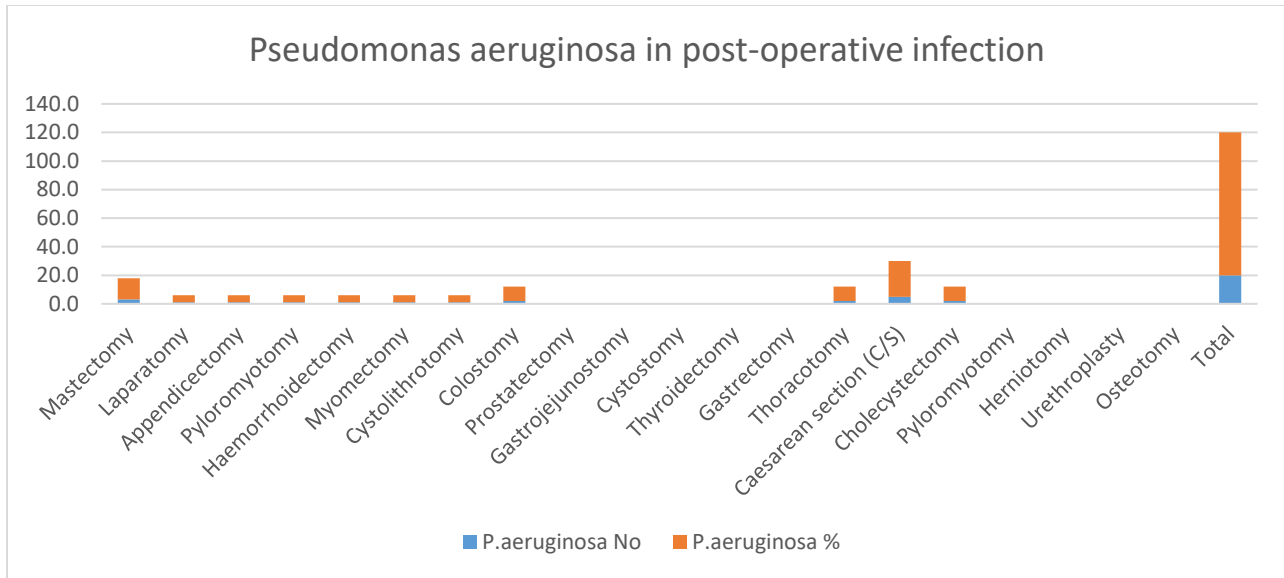


Table-3 displays the prevalence of PA in the infection of wound postoperative in association with age and gender. The categorization of the age carried out into three groups as from few months to 29 year of age, 30 to 59 years and 60 & above. The findings showed that prevalence of the PA was very high in young patients

(15.0%) & elderly patients (10.0%) as compared to the age group of 30 to 50 years of age (8.30%). The findings of this research work also displayed that long stay of the patients in the hospitals increases the risk of acquiring the infection due to bacteria. We also obtained the 3 isolates of PA from the staff of nursing.

Table-III: Occurrence of Pseudomonas Aeruginosa in Post-Operative Wound Infection in Relation to Age and Sex (n=20)

Factors		No. Samples	P. Aeruginosa	
			No	%
Age	0-29	28.0	9.0	0.15
	30-59	22.0	5.0	0.08
	60 and above	10.0	6.0	0.10
	Total	60.0	20.0	0.33
Sex	Male	28.0	8.0	0.13
	Female	32.0	12.0	0.20
	Total	60.0	20.0	0.33

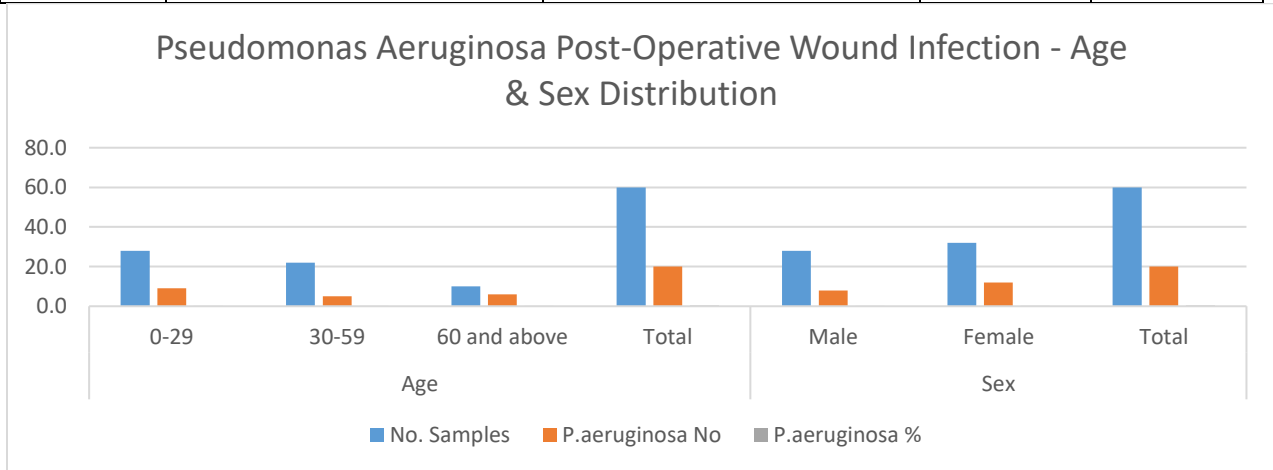
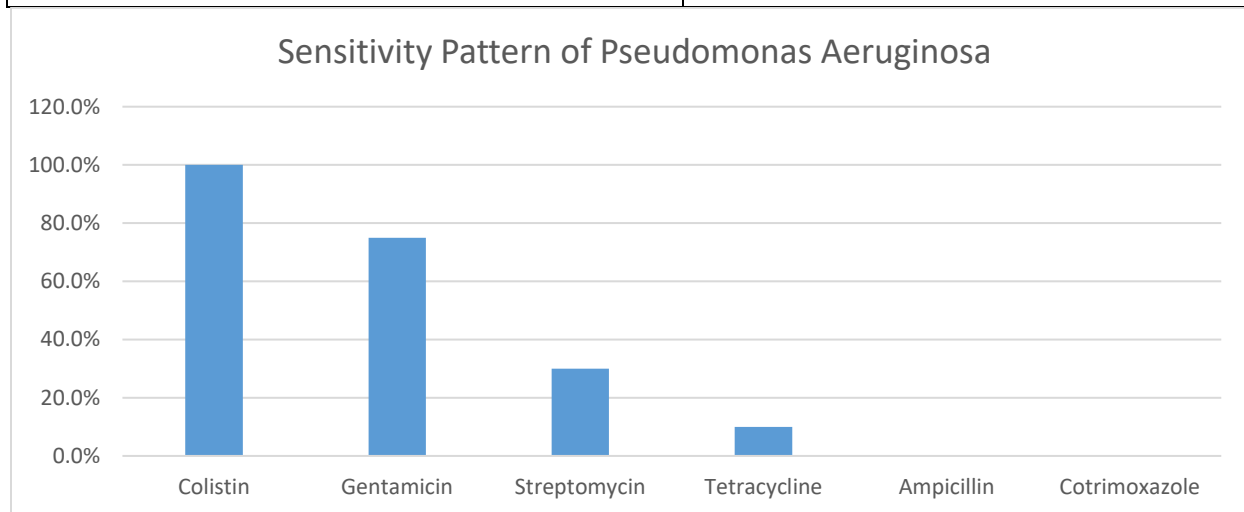


Table-4 displays that sensitivity pattern of PA separated from wound due to surgery. These organisms have a very sensitive behavior towards colistin, streptomycin & gentamicin. Tetracycline added with colistin was displaying the greatest rate of sensitivity but it was resilient to the ampicillin & cotrimoxazole.

Table-IV: Sensitivity pattern of Pseudomonas Aeruginosa Isolated from Post-Operation Wound Infection (n=20)

Antibiotics	sensitive (%)
Colistin	100.0%
Gentamicin	75.0%
Streptomycin	30.0%
Tetracycline	10.0%
Ampicillin	0.0%
Cotrimoxazole	0.0%



DISCUSSION:

The aim of this research work was to find out the incidence of the PA in postoperative infection of wound & pattern of its sensitivity to frequently utilized antibiotics. The obtained findings displayed a very high occurrence of Pseudomonas as 33.30% from all other pathogens separated from the postoperative wound from various types of surgeries. Joshi [7] concluded the rate of occurrence of 6.80%. The findings of this current research work showed a very high occurrence in comparison with the conclusion of Joshi. This change was due to the variations in the regions of geography and the measures taken for improvement of hygiene. This also discovered the rising occurrence of the PA in the postoperative infections of wounds as observed by many professionals particularly in current years.

Joshi [7] quoted the statement of the Najak that PA has taken the place of the S. aureus in the postoperative infection of wound and stated that Najak recorded 16.80% for PA & 5.60% for the S. aureus. This is obvious that the rate of prevalence of PA as concluded

in this research work is much in agreement with the research works conducted in other health care centers. Moreover, this research study shows that the incidence of the PA in postoperative infection of the wound is depending upon the age, gender & total stay in the health care center by the patient. The infections were much frequent among the very young and elder patients. We also isolated the PA from the hands of the nurses. This finding is much similar with the findings of the Cruse [10] who concluded that nurse's hands are the carrier of PA who are working on the infected persons in different wards of hospitals. The pattern of susceptibility of twenty PA isolates to some frequently utilized antibiotics as stated in his research work is much same with the research works of the Joshi [7] & Opara [11].

CONCLUSION:

This research work displays that there is very high prevalence of the PA in postoperative infections of wound. This finding is very much similar with the many research works conducted in different health

care centers available in this country or many other countries of the world. These infections are very common in hospitals with low measures associated with hygiene & these infections are totally depending upon the age of patient, gender of patient & the total hospitalized stay of the patient.

REFERENCES:

1. Cruse PJE. A five-year prospective study of 23 649 surgical wounds. *Arch Surgery* 1973; 107: 206-7.
2. Maniatis AN, Trougakos IP, Palermos J, Maniatis NA, Legakis NJ. Changing patterns of bacterial nosocomial infections: a nine-year study in a general hospital. *Chemotherapy*, 1997; 43: 69-76.
3. Opara AA. *Pseudomonas aeruginosa* infections in some hospitals in Calabar, Cross River State. *Nigerian J Microbiol* 1982; 2: 125-30.
4. Isenberg HD, Washington II JA, Balows A, Sonnenwirth AC. Collection, handling and processing of specimens. In: *Manual of Clinical Microbiology*. 4th ed. Lennete EH, Balows A, Hausler Jr WJ, Shadomy HJ, eds. Washington DC. Am Soc Microbiol 1985;78-89.
5. Trilla A. Epidemiology of nosocomial infections in adult intensive care units. *Intensive Care Med* 1994; 20(3): 1-4.
6. Kirkland KB, Briggs JP, Trivette SL. The impact of surgical- site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs. *Infect Control Hospital Epidemiol* 1999; 20(11): 725-30.
7. Balows. *Manual for Bacteriological Examination* 1985; WHO.
8. NNIS System. National nosocomial Infections Surveillance (NNIS) report, data summary from October 1986-April 1996, Issued May 1996.
9. Andreassen JJ, Korsager B, Alstrup P, Jepsen OB. Post-operative wound infection: indicator of clinical quality? *Dan Med Bull* 2002; 49: 242-4.
10. Joshi KR, Onaghise EO, Oyaide SM. Aeruginosine typing of *Pseudomonas aeruginosa* isolated at the University of Benin Teaching Hospital, Benin. *Afr J Clin Microbiol* 1984; 1: 13-18.
11. Kolmos HJ, Svendsen RN, Nielsen SV. The surgical team as a source of post-operative wound infections. *J Hosp Inf* 1997; 35: 207-14.