

Bacteriological Analysis of Wound Infection in Mayo Hospital, Lahore

Pages with reference to book, From 66 To 68

Shahbaz Aman (Department of Microbiology, Allama Iqbal Medical College, Lahore.)

Abstract

Five hundred specimens of pus or pus swabs, from various wards of Mayo Hospital, were studied in the Pathology Department of King Edward Medical College, during the period ranging from 1-1-1979 to 1-7-1979. The incidence of various organisms along with their anti-biogram was studied. The common organisms were *Staph. aureus* (28.64%), *E. coli* (24.73%), *Pseudomonas* (23.69%) and *B. Proteus* (10.41%). (JPMA 32:66, 1982).

Introduction

Surgical wound infection is as old as man. It is still one of the important problem in hospitals infection, and continues to be the major source of mortality in the surgical patients.

Numerous investigations have been published in this field. According to "National Research Council of CANADA" 2450 papers have been written (upto 1962) on Hospital infection caused by *staphylococcus aureus* and other bacteria. Many of them dealt with the post-operative wound infection. Frequency of the post-operative wound infection varies from time to time and from place to place, but several elaborate and well controlled studies during the last 15 years have proved infection rate to be between 7 and 9 percent (ad-hoc Committee National Research Council, 1964; Altermier 1971, Brote, 1976, Bengresson et al, 1979).

Source of Infection

The wounds become infected through many variable sources. In the operation theatre the source may be the physical environment of the theatre due and polluted air-coming from wards, through the staff working in the theatre or incompletely sterilized instruments used in surgery. *Staphylococcus aureus* usually infects wounds through anterior nares of the personnel working in the theatre. In the wards the infection may occur by fomites particularly linen (Blankets which are difficult to sterilize) but usual mode is by direct contact: the main vehicle is the contaminated hands of attendants.

Material and Methods

The study was conducted on 500 specimen of Pus or Pus Swabs received from different wards.

Instructions to the Hospital staff were given to take the swab as recommended by Cruickshank et al., (1975) and to be sent immediately to the laboratory for processing.

Each sample was streaked on three medium sized petridishes containing agar and Macconkey medium one plate was used for testing antibiotics sensitivity. Isolation of pus culture was done by morphological, cultural and biochemical tests.

In vitro antibiotic sensitivity testing was performed using disc method as recommended by Cruickshank et al., (1975). Commercially available discs of septran, Velosef, Keflex, lin-. comycin, ampicillin, Carbenicillin, Gentamycin, erythromycin and nalidixic acid were used.

Results

Of 500 specimens included in this study, 116 showed no growth whereas 384 cultures yielded growth of various organisms. Among these staph. aureus was the commonest organism in 110 (28.64%) specimens while next in frequency was E. Coli in 95 (24.73%) specimens. Pseudomonas in 91(23.69%) and Bacillus proteus in 40 (10.41%). specimens The relative frequency of these organisms are shown in Table-I.

Table I
Frequency of Organisms

<i>Type of Organisms</i>	<i>Total No. of Specimens</i>	<i>Percent- age</i>
Staph. aureus.	110	28.64%
E. Coli.	95	24.73%
Pseudomonas.	91	23.69%
B. Proteus.	40	10.41%
Staph. albus.	12	3.12%
Klebsiella aerogenes.	9	2.34%
Strept. haemolyticus.	6	1.56%
Pseudomonas + E. Coli.	8	2.08%
Strept. Viridan.	4	1.04%
Staph. Aureus + E. Coli.	2	0.52%
B. Subtilis.	6	1.56%

Anaerobic cultures were not included in this study.

Two hundred and forty specimens out of 500 i.e., 60% were received from General Surgical wards.

Other important sources included Orthopaedic units (84 specimens i.e. 16.8%) and emergency unit (77 specimens i.e. 15.4%). The distribution of cases is shown in Table II.

Table II
Source of Specimens

<i>Name of the Ward</i>	<i>No. of Specimens</i>	<i>Percent- age</i>
General Surgical	240	60%
Orthopedic	84	16.8%
Emergency	77	15.4%
Gynae & Obs.	51	10.2%
Medical Wards	24	4.8%
Private ward cases	14	2.8%

Sensitivity tests revealed that no single drug was effective in all cases. Organisms from 374 were sensitive to drugs used in the study whereas isolates from 10 specimens were resistant to all the drugs. Gentamycin was found to be Specimens age the drug of choice as it was effective in 312 cases (83.42%).

The drugs next in order of efficacy were Carbencillin and erythromycin each being effective in 160 cases (42.78%). Velosef and Keflex proved effective in 85 specimens (22.72%). Furthermore, most of these drugs have been extensively used in Pakistan. Therefore, organisms might have developed resistance against these drugs. Griffiths et al (1976) reported that single intravenous dose of tobramycine and lincomycin given at the start of gastrointestinal operations significantly reduced the post operative wound infections. In this study lincomycin was effective in (28.07%) 105 cultures while tobramycin was not used.

Discussion

Wound infections, still remain a serious problem for surgeons. The use of potent antibiotics has resulted in an increased bacterial resistance and neglect of established principles of asepsis (Altemeier et al, 1955).

In Vitro Antibiotic Sensitivity in Percentage.

<i>Name of antibiotic</i>	<i>Max. Sensitive</i>	<i>Mod. Sensitive</i>	<i>Resistant</i>
Gentamycin	64.10% (200)	39.10% (112)	8.55% (32)
Carbencillin	61.25% (98)	38.75% (62)	56.68% (212)
Erythromycin	59.37% (95)	40.62% (65)	56.68% (212)
Velosef	78.58% (60)	29.41% (25)	77.27% (289)
Keflex	29.41% (25)	78.58% (60)	77.27% (289)
Lincomycin	9.52% (10)	90.47% (95)	71.92% (269)
Septran	21.42% (15)	78.47% (55)	81.28% (304)
Ampicillin	19.23% (10)	80.76% (42)	86.09% (322)
nalidixic acid	21.42% (15)	28.57% (20)	90.64% (339)

Note:—Values in Parentheses indicate the number of Specimens.

The pattern of bacterial flora studied from the wound indicates that staph. aureus still remains the commonest infecting organism; however, it is difficult to find conclusive evidence that post-operative infection due to staphylococcus aureus has increased in the antibiotic era (Belir-inger et al, 1965, National Academy of Science Report 1964). Berbee et (1975) reported staph. Aureus as the single most important pathogen in hospital infections. It seems likely that staphylococcus wound infection is due to emergency of resistant strains resulting from indiscriminate use of antibiotics. Later on, with improved techniques, gram negative bacilli were also found infecting the wounds. Raohave (1976) observed that staphylococcus and escherichia coli were the most predominant organisms 111 post-operative wound infection of hip and ankle region. Rains and Richie (1977) reported the staph aureus and gram negative bacilli as the most important pathogens in hospital infection. These gram negative organisms are more dangerous because of their endotoxins.

The present study was undertaken to determine the relative incidence of various aerobic micro-organisms associated with wound infection and in vitro sensitivity to commonly used antibiotics. Our results also clearly demonstrate the presence of staph aureus and gram negative bacilli as the important pathogens in hospital infection.

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