Research Paper

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# Recent Scenario of Most Common Aerobic Bacterial Isolate from Diabetic Foot Ulcer in Saurashtra Region and its Antibiotic Sensitivity Pattern

Medical Science

**KEYWORDS :** Diabetic foot ulcer, Antibiotic sensitivity pattern

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## ABSTRACT

*Introduction: A Prospective study "Recent scenario of most common aerobic bacterial isolate from Diabetic foot ulcer in saurashtra region and its Antibiotic sensitivity patter" was carried out in tertiary care hospital, Rajkot. Total 60 patients were studied. Material and Methods: swab samples were collected from the diabetic foot ulcers and they were processed for culture and antibiotic sensitivity testing. Results: out of 60 patients studied 98 organisms were isolate, from which 86 isolate were gram negative bacteria and out of 86 there were 24 Pseudomonas aeruginosa which was the predominant isolate. Conclusion: Diabetic foot ulcer infection is polymicrobial in nature and bacteria are multidrug resistant. And use of broad spectrum antibiotic leads to easy survival of resistant bacteria.*

**Introduction**

Diabetes mellitus is a disorder that shares the phenotype of hyperglycemia. The prevalence of diabetes depends on many etiological factors such age, sex, heredity, diet, socioeconomic condition, life style choice, physical activity, environmental condition. Diabetes is multifactorial disease in which various factors act in complex manner [1]

A WHO report indicate that india has the largest diabetic population( 19 million in 1995 ) that is expected to rise 57 million by 2025.[2]

A commonly accepted definition of foot infection is the presence of systemic signs of infection for eg. Fever and leucocytosis or purulent secretion or two or more local symptoms or signs ( redness, warmth, indurations, pain or tenderness)[3]

The present study undertaken to assess the role of Pseudomonas aeruginosa in the causation of diabetic foot ulcers and its antibiotic sensitivity patter. The antimicrobial spectrum of these isolate would assist clinician in therapy of dreaded complication of diabetes.

Pseudomonas aeruginosa is widespread in nature inhabiting soil, water, plants and animals (including human). It has predilection for moist environment. This organism occasionally colonizes the skin, external ear, upper respiratory tract, or large bowel of healthy humans.[4]

Pseudomonas exhibits high degree of resistance against chemical agents like quarternary ammonium compounds, chloroxylenol and hexachlorophene and it grow profusely in bottles of such antiseptic lotion kept for use in hospital. [4]that is the most probable reason why it is the common organism causing in hospital acquired infection.

Pseudomonas may cause severe tissue damage in diabetic and should never be ignored as insignificant in diabetic foot ulcers. It should never be considered a contaminant or normal flora and it should be considered a pathogen, because it may result in sepsis or amputation.[5]

**Material and Methods**

The present study was undertaken over a period of 1 year from June 2011-July 2012 in the Department of Microbiology, Pandit Deendayal Upadhyay Medical College and Hospital Rajkot, 60 diabetic patients with foot ulcer attending the Surgery Department of Civil Hospital Rajkot were included in the study. These patients were diabetic or detected to be diabetic by blood glucose estimation at the time of their visit to the hospital. A detailed history of the patient regarding age and sex, duration of diabetes, type of diabetes, duration of foot ulcer, smoking, hypertension, peripheral neuropathy, peripheral vascular disease, antibiotic usage was taken and recorded

**Isolation and identification of bacteria**

Isolation and identification of test organisms were carried out by performing the various test, which were gram staining, motility, catalse test, nutrient agar, ability to grow at $42^{0C.}$ arginine dihydrolase, acid from Hugh-Leifson's glucose.

**Antibiotic sensitivity testing (Kirby Bauer Disk Diffusion method)**

Antibiogram was performed using commercially available antibiotics discs (High media, Mumbai) with a standard P. aeruginosa ATCC 27853 as a positive control . Kirby Bauer recommended by the CLSI was used for antimicrobial sensitivity testing. These identified strains were tested against ceftazidime, Gentamicin, Piperacillin, Amikacin, Aztreonam, Cefepime, Levofloxacin, Imipenem, Piperacillin + Tazobactum.

**Results**

Total 60 known cases of Diabetes suffering from Diabetic foot ulcer admitted at P.D.U Government Hospital during june 2011 to july 2012 were studied.

Pus swabs were taken from the ulcers of all 60 patients and they were processed for aerobic bacteriological culture and antibiotic sensitivity testing. Of these 60 samples 98 organisms were isolated. From them 86 isolates were Gram negative bacteria and from them 24 were Pseudomonas aeruginosa.

**Table 1: Antibiotic sensitivity pattern of Pseudomonas aeruginosa.**

| Drugs | Sensitivity in No and Percentage |
|---|---|
| Ceftazidime | 18 (75%) |
| Gentamicin | 10 (41.6%) |
| Piperacillin | 16 (66.6%) |
| Amikacine | 22 (91.6%) |
| Aztreonam | 16 (66.6%) |
| Cefepime | 14 (58.3%) |
| Levofloxacin | 24 (100%) |
| Imipenem | 20 (83.3%) |
| Piperacillin + Tazobactum | 24 (100%) |

**Table 2: Isolation of Organisms**

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| Total Patients Studied | 60 |
| Total Organisms isolated | 98 |
| Polymicrobial pattern seen | 38 |
| Gram Negative Isolates | 86 |
| Gram Positive Isolates | 12 |

**Discussion**

Worldwide diabetic lesions are major medical social and economic problem and are the leading cause of hospitalization. Diabetic foot is considered one of the most threatening and disabling complication for diabetic patients as lesion of the extremities can become so severe that patients may risk the amputation of toe, foot or leg.

In the present study, we observed that the males were in majority 76.6% and female were 23.4%. the M:F was 3.2:1, showing diabetic foot ulcer to be more common in males. Our results are comparable with the NA Pathare et al[6](1998), in which the male affected were 78.6%, D Vijay et al7(2000), male affected were 72.5%. Mamatha P samaga8 (2006) male affected were 65%.

In the present study most common organism isolated was Pseudomonas aeruginosa which is comparable with Bansal E9.

In present study the antibiotic sensitivity pattern is comparable with study of Ekta et al in which sensitivity of Meropenem, Piperacillin, Ceftazidime, amikacine were 100%, 83.33%, 94.44%, 78.95% respectively. While in present study the sensitivity of Meropenem, Piperacillin, Ceftazidime, amikacine were 83.3%, 66.6%,75%, 91.6%.

Now a days pseudomonas become more resistant then previous days that is why it is a serious issue for the hospital acquired infection and diabetic foot ulcer infection.

**Summary**

In the present study, from 60 swabs, 98 organisms were isolated, and from that 24 were Pseudomonas aeruginosa.

Antibiotic sensitivity testing showed that ceftazidime, gentamicin, cefepime are comparatively less sensitivite than amikacin, imipenem, meropenem, and combination of drug like piperacillin and tazobactum.

This resistant pattern might be due to broad spectrum of antibiotic usage, which leads to survival advantage to resistant organisms.

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