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Bacteriological Study of Diabetes Foot Ulcer

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Abstract:

Diabetes is a long life disease in which the sugar level is increased in blood. Diabetes contains the one of the most complication disease that is Diabetic foot ulcer. Diabetes foot ulcer is one of the major medical, social and economic complications of Diabetes mellitus and this infection has polymicrobial nature. Diabetes foot ulcer infections have the optimal treatment in which the type of foot ulcer infection is recognized and pathogen-appropriate antibiotic therapy is suggested. In case of non-recognizable and uncontrolled of foot ulcer diabetes, it can be leads to many devastating consequences like limb amputation, sepsis, and even mortality and hospitalized. In this review paper, we studied about the bacteriological profile of Diabetes Foot Ulcers.

Keywords: *Diabetes Mellitus, Foot Ulcer Diabetes, Polymicobial, Pathogen*

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Introduction

Diabetic foot is among the most critical conditions of diabetes that leads to cause hospitalization among diabetic patients (Shanmugam, Jeya and Linda, 2013). According to World Health Organization (WHO), this disease widespread with an increasing incidence and peoples are afflicted approximately 150,000,000 across the world. Diabetic Foot is referred to as infection and ulcers that is accompanied by neuropathy and arteriovnous abnormalities in the foot of patients with diabetes (Sheikh *et al.*, 2014). Approximately 57 million Indian peoples will affected by Diabetes in the year of 2025. Individuals contain diabetes involve soft tissue and bone infection of foot other than without diabetes (Shanmugam, Jeya and Linda, 2013).

Diabetic foot decreases the action of Phagocytic cells thereby weaken the immunity. In lower extremities, the blood supply is compromised by local injuries and improper foot wear but foot infection with diabetes are initially treated empirical in patients, a therapy which is directed at the known causative organism may improve the outcome (Sheikh *et al.*, 2014).

Many studies have been reported before 25 years ago on bacteriology of Diabetic Foot Infections (DFIs) but its result have been diverse and contradictory. The differences in the positive organism causes discrepancies, which had happen overall period of time, variation in a geographical region on the infection type or severity as were stated in various studies.

Polymicrobial infection involving gram negative and obligate anaerobic organisms are likely to occur in other patients. For the treatment of diabetic foot ulcers, using the antibiotic therapy in which need to be guided appropriately in the light of causative organism and its sensitive pattern to various drugs and calls upon a well-planned bacteriological study of diabetic foot ulcers (Patil and Mane, 2017).

Treatment of Diabetic Foot Ulcer

Controlling the hyperglycemic burden whose patients presenting with the Diabetic Foot Ulcer (DFU) by calling up to “the Triad”. This triad is a wide spectrum antimicrobial chemotherapy including a 3rd generation Cephalosporin Ceftriaxone, a 2 generation fluoroquinolone and Ciprofloxacin and Lincosamide class, Clindamycin. This triad was given together with a periods of two weeks.

Our Inclusion Criteria Included:

- Without osteomyelitis, positive detection of diabetic ulcer.
- During 3-months periods, ability to attend the clinic visits.
- Lab tests confirming active infection (Complete Blood Count (CBC) with high Thin Layer Chromatography (TLC).

The Exclusion Criteria were:

- According to Infectious Diseases Society of American Classification, patients with severe infection causing remarkably disability.
- Presence of Osteomyelitis.
- Patients with moderate to severe Peripheral Arterial Disease (PAD) that was clinically diagnosed by absence of both distal pulse and confirmed by Duplex study.

Antibiotic Susceptibility Testing: By using disc diffusion method, all bacteria isolates were tested for antibiotic susceptibility against selected members of the following groups: Amikacin, Gentamycin, Clindamycin, Amoxicillin/ Clavulanate, Azithromycin, Ceftazidime, Cefotaxime, Cephalexin, levofloxacin, Ciprofloxacin Ofloxacin, Piperacillin/Tazobactam, Dicloxacillin, Ipipenem, Ampicillin/sulbactam, Chloramphenicol and Penicillin.

Methicillin-resistant Staphylococcus Aureus (MRSA) Detection: In case of equal to or more than 22mm of cefoxitin then organism was reported to as Methicillin Sensitive Staphylococcus aureus while cefoxitin is less or equal to 21mm were reported as Methicillin Resistant Staphylococcus aureus (MRSA) (Shanmugam, Jeya and Linda, 2013).

Review of Literature

Citron(2007) their study showed that patients having moderate to severe infection did not receiveanitibiotic treatment.

Alsaimary(2010) high level of sugar in blood damage the blood vessels. Poor blood flow causes ulcers.

Shanmugam, Jeya and Linda (2013) in this review paper, diabetic foot infections are caused by both gram positive cocci and gram negative bacilli and show the greater importance of gram negative bacilli. The pattern of antibiotic susceptibility are isolated from diabetic foot infections that is crucial planning for treatment of this disease.

Sheikh (2014) stated that identification of pathogens should be done after which corresponding antibiotic should be given for treatment Within the 3 months of period, improve the rate of ulcer (through various criteria)

Simonsen *et al.* (2015) In this review paper, observed that bacterial infections were more common in patients with type I diabetes. Reported use of antibiotics and frequency of bacterial infection were basically associated in diabetic patients having an increased risk of incident microalbuminuria. It show the result with type I diabetes that increase the risk of less severe infections, can be treated outside the hospital.

Conclusion

Foot ulcers occur at high level within the population of people with diabetes. It is mainly found in lower part of the body and turns severe if not taken into serious account. These diabetic foot infections are caused by both gram positive cocci and gram negative bacilli. This review studies conclude that there is need to provide the high standard of care and appreciation of causative organisms in diabetic foot.

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