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A STUDY OF DIABETIC FOOT ULCER WITH MULTIDRUG-RESISTANT ORGANISM INFECTION:

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Abstract:

Due to the increased resistance rate of *Escherichia coli* and *Pseudomonas aeruginosa* among gram-negative bacteria, the risk factors of drug-resistant negative bacilli in patients should be evaluated in the development of initial anti-infective treatment regimen in clinical practice. In this study, multidrug-resistant bacteria accounted from the strains obtained by wound cultures, which may be related to the patients with serious illness admitted to our hospital as a tertiary care hospital and the more complex history of antibacterial drug use. This study puts in a sincere effort to find the risk of diabetic foot ulcer with multidrug-resistant organism infection.

Keywords: Drug, Resistance, Foot Ulcer.

Introduction:

Earlier studies reported that Gram-positive bacteria such as *Staphylococcus aureus* and *Enterococcus faecalis* were considered as the most common flora of diabetic foot infections, followed by Gram-negative bacteria such as Escherichia coli and Pseudomonas aeruginosa [1, 2]. In recent years, the bacterial spectrum of diabetic foot infections has shifted considerably with the evolution of diabetes epidemiology and changes in the application of antimicrobial drugs [3, 4]. *Staphylococcus aureus* according to a report is the most common bacterium among all aerobic bacteria, which was consistent with the bacteriological characteristics of skin and soft tissue infections [5]. In a study the analysis of bacterial resistance, it was found that *Staphylococcus aureus* was the main multi-drug resistant bacteria in diabetic foot ulcer infection, and the resistance rate of *Escherichia coli* was the highest among gram-negative bacteria, followed by *Pseudomonas aeruginosa*, [6]. Infection with multidrug-resistant bacteria in diabetic foot ulcers increases the difficulty of treatment by reducing the clinical effect of antibiotics therapy, leading to amputations or deaths [5, 7, 8, 9]. Due to the increased resistance rate of *Escherichia coli* and *Pseudomonas aeruginosa* among gram-negative bacteria, the risk factors of drug-resistant negative bacilli in patients should be evaluated in the development of initial anti-infective treatment regimen in clinical practice. This study puts in a sincere effort to find the risk of diabetic foot ulcer with multidrug-resistant organism infection.

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Aims and Objectives:

To study the diabetic foot ulcer with multidrug-resistant organism infection.

Materials and Methods:

This study included 130 patients with diabetic foot ulcer in Srinivas Institute of Medical Sciences, Mangalore from Feb 2012 to Jan 2014.

On admission, the skin around the wound was cleaned with povidone iodine solution. After careful irrigation of the wound with normal saline, remove necrotic tissue as needed. Irrigate the wound again, press a sterile cotton swab firmly into the wound and rotate to collect deep secretions. After 30 minutes, the swabs were transported to the microbiology laboratory in a sterile container. The specimens were inoculated and cultured, and the strains were identified.

Results:

Table 1: Bacterial Distribution and Drug Resistance Rate:

Bacteria	MRDO+	MRDO-
Staphylococcus spp		
S-Aureus	**11**	**15**
S-epidermidis	**01**	**04**
Other S spp	**01**	**16**
Streptococci spp	**09**	**02**
Enterococcus spp	**01**	**02**
Gram Negative		
E-Coli	**10**	**16**
Proteus spp	**01**	**18**
Klebsiella spp	**01**	**07**
Pseudomonas	**01**	**14**
Total	**36**	**94**

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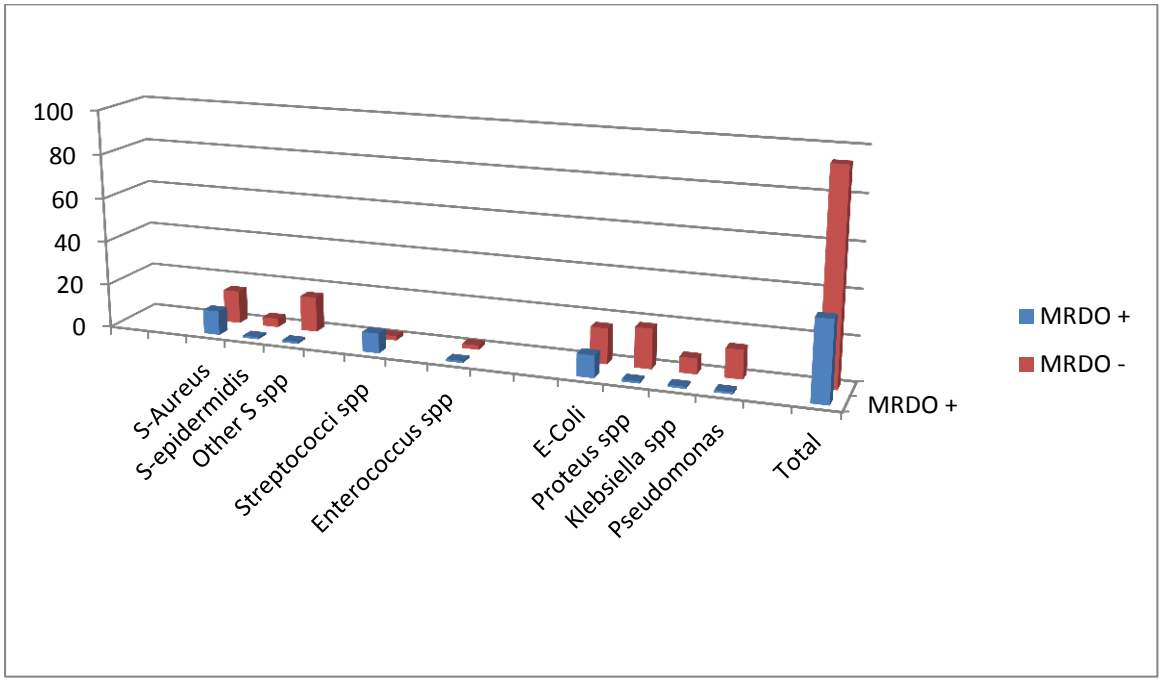
Graph 1: Bacterial Distribution and Drug Resistance Rate:



Discussion:

Diabetic patients often have a high prevalence of diabetic foot infection (DFI) due to associated neuropathy, peripheral vascular disease, immune abnormalities, etc. Some studies have shown that about 15% of diabetic patients can develop foot ulcers during their lifetime [10]. Diabetic foot ulcer wounds contain a large number of protein and carbohydrate nutrients, which can be a nidus for infection. About 40% to 80% of patients with diabetic foot suffer from a concurrent infection. 25% of patients with mild infection develops with severe deep infection. Clinically, the disease develops rapidly for a certain proportion of patients with mild infection and they need attention [11]. The types of diabetic foot infections are complex and varied. In addition to the common cellulitis, complications can involve osteomyelitis and gangrene [12]. Since the increasingly severe form of prevention and treatment of diabetic foot ulcer infections is associated with a high rate of detection of multi-drug resistant bacteria, it is important to focus on assessing the risk factors of multi-drug resistant bacterial infections in order to find more effective treatment [13,14,15]. Multi-drug resistance (MDR) organisms refer to bacteria that exhibit drug resistance to three or more commonly used antibiotics that are usually sensitive. Multiple drug resistance also includes extensive drug resistance (XDR) and pan-drug resistance (PDR). Clinically, Common MDR include methicillin-resistant staphylococcus aureus (MRSA), vancomycin-resistant enterococcus (VRE), bacteria that produce ultra-broad spectrum β-lactamase (ESBLs) in enterobacteriaceae (such as escherichia coli and klebsiella pneumoniae), carbapenem-resistant enterobacteriaceae, multidrug-resistant Pseudomonas aeruginosa (MDR-PA), multi-drug resistant acinetobacter baumannii (MDR-AB), etc. [16]. The aim of this study is to

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analyze the bacteriological characteristics of diabetic foot ulcers, drug resistance of isolates, and to reveal the potential risk factors for multi-drug resistant bacteria. This allows for more effective assessment and treatment plans for patients with MDR diabetic foot infections.

Conclusion:

Early empiric antibiotic treatment is necessary for patients at high risk of MDRO infection. This study puts in a base for other studies so that a regional data grows so that it would be useful for the practising physicians and surgeons.

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