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CASE REPORT

Fusarium: A rare factor in diabetic foot infection

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ABSTRACT

Diabetic foot infections are an important cause of morbidity. In humans, Fusarium causes external infections. A male obese patient at the age of 56 who had been getting treatment in various clinics due to ulceration and lymphedema. Treatment started with tigecycline 50 mg vial 2x1. Alcaligenes faecalis and Proteus vulgaris reproduced. Tigecycline treatment was stopped on the 4th day and piperacillin/tazobactam 4,5 gr vial 3x1 and liposomal amphotericin B 3 mg/kg/day were initiated. In direct microscopic examination, hypes were seen and *Fusarium spp*. reproduction was detected. Liposomal amphotericin treatment was stopped on the 15th day and voriconazole 200 mg tb po 2x1 was initiated. At the end of one month, the lesions were regressed entirely. It should not be forgotten that despite its scarcity, fungus factors might give rise to diabetic foot infections and patients should be evaluated in terms of fungus infections. *J Microbiol Infect Dis 2017; 7(1): 42-45*

Keywords: Fusarium, Diabetic foot, Voriconazole

INTRODUCTION

Diabetes mellitus is a metabolic disease affecting many organs and systems, which is characterized by a high level of serum glucose. Its frequency is increasing all over the world.

Diabetic foot infections developing in these patients are important cause of morbidity. Diabetic foot infection can simply be defined as an infection which develops in the inframalleolar region of a diabetic patient [1].

Diabetic patients have a propensity to infections due to the reasons such as neuropathy, vascular insufficiency and dysfunction of neutrophils. The most important risk factor is the existence of peripheral neuropathy, and it is present in 30 to 50 percent of diabetic patients.

The foot becomes susceptible to trauma as a result of sensory, motor and autonomic dysfunction, and excessive pressure occurs in the deformed foot.

While most diabetic foot ulcers remain superficial, in 25 percent of the cases, the infection penetrates into deep tissue and the bone. In most of the infections, surgery may be required ranging from minor debridement to major amputation [2]. Besides, the addition of risk factors such as atherosclerotic occlusion, smoking and obesity makes the treatment more difficult. On the other hand, fungal factors are rarely seen in diabetic foot infections.

Types of Fusarium exists in soil and plants as saprophyte. In humans, it causes superficial infections like keratitis and onychomycosis as well as local invasions or prevalent infections, especially in immunocompromised patients.

In this report, a case with obesity, stasis dermatitis, and *Fusarium spp.* as a factor in diabetic foot infection is presented.

CASE

A male obese patient at the age of 56 who had been getting treatment in various clinics both due to ulceration which was edematous, catarrhal with brown-gray exudate islet cells on a white plaque clustered around low extremity and owing to simultaneous lymphedema in the bilateral low extremity. In his history, he had diabetes for twenty years. The patient applied to

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the diabetic foot council. He was hospitalized to department of dermatology.

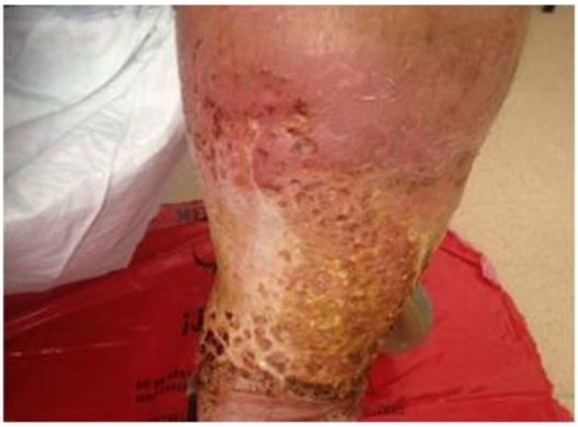

Figure 1. Pretreatment appearance.

On physical examination, he was conscious, oriented and cooperative. In laboratory, White Blood Cells:10,680 µL (4.5-11.000 µL), sedimentation:96 mm/hour (<20), CRP:4.7 mg/dL (0,5 mg/dL) was detected. After tissue culture was taken, treatment was started with the injection of tigecycline loading dose following 50 mg vial 2x1. During the bacterial examination of the tissue cultures, fungus, *Alcaligenes faecalis* and *Proteus vulgaris* reproduced. Tigecycline treatment was stopped on the 4th day and piperacillin/tazobactam 4.5 gr 3x1 and liposomal amphotericin B 3 mg/kg/day were initiated.

In direct microscopic examination, hypes were seen and *Fusarium spp.* reproduction was detected. Following the cultivation in Sabouraud dextrose broth (SDB-Oxoid) for a 48-72 hour period, weak growth with a mould morphology was observed onto Sabouraud dextrose agar (SDA-Oxoid) slants. The mould growth on the culture slants attained specific colony morphology in 4-5 days. In direct microscopic examination of the colonies performed with lactophenol cotton blue, conidia with a needle-like appearance and hyphal structures suggested *Fusarium spp.*

No reproduction was occurred in the control tissue cultures taken on the 11th day of the treatment but there was an increase in the kidney function test values and blood sugar was also high. Because of these conditions, the patient was transferred to endocrinology service. During the surveillance, the patient, who had regulated blood sugar and whose Hba1c was 6.2, developed vascular access problems. So, liposomal amphotericin treatment was stopped on the 15th day and voriconazole 200 mg tablet p.o. 2x1 was initiated.

In Doppler USG, bilateral deep venous insufficiency was detected in lower leg extremity.

There was no reproduction of the control tissue cultures of the patient under surveillance whose lesions were seen to have been regressed by the help of leg elevation, daily medical dressing and antibiotheraphy.

The patient was discharged on condition that voriconazole p.o. treatment would be completed in a month. At the end of one month, it was observed that the lesions were regressed entirely.

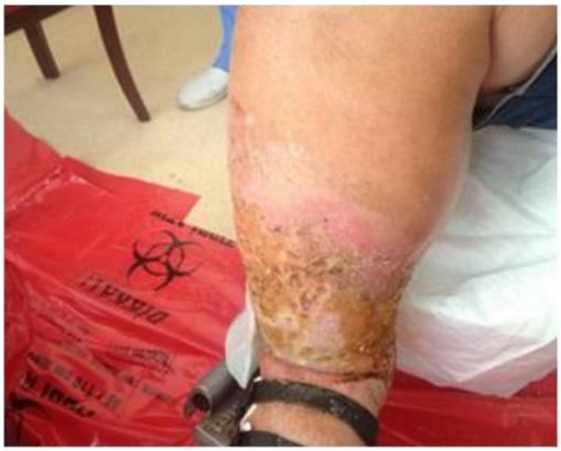

Figure 2. Posttreatment appearance.

DISCUSSION

Incidence of diabetes is around 2.1% across the world. In Turkey, according to TURDEP-II, it has been seen that incidence of this disease has reached up to 13.7% among adults [3]. Among the most witnessed complication of diabetes comes the diabetic foot ulcer. It generally results from peripheral neuropathy and ischemia, and it is among the most prevalent causes of hospitalization. It is known that by 40% to 80% of the cases are infected and 14 to 24% of these cases results in amputation [4].

Diabetic foot infections are polymicrobial infections. Gram positive, Gram negative and anaerobes are regarded as infection factors in particular. Fungal infections, though rare, may also lead to diabetic foot infections. Fungal infections should be considered in cases which have deep tissue infections and do not respond

to antimicrobial treatment. These patients may be infected with peripheral fungi such as Aspergillus, Alternaria and Fusarium, and fungi such as Candida and Cryptococcus which lead to opportunistic infections.

Fusarium species are found widely in tropical and subtropical regions. Fusarium may cause skin, eye and nail infections. It may rarely cause diabetic foot infections. In a 56 years old patient with diabetic foot infection, *Fusarium sporotrichioides* was reported by means of conventional and molecular techniques, and it was recommended that the Fusarium should not be assessed only as peripheral contaminants [5].

Fusarium species may cause intoxication by invading grain. Besides, it may lead to infections like conjunctivitis, ceratitis, endophthalmitis, maxillary sinus infection, osteomyelitis, septic arthritis, brain abscess, colonization in burns and necrotic wounds, ulceration on legs, deep tissue infections, contact dermatitis and onychomycosis, though they are rare in immunsupressed patients [6-9].

In diabetic foot infections, piperacillin-tazobactam, imipenem, meropenem can be used unaccompanied; ceftazidime or quinolones can be used in combination with metronidazole. If there is MRSA or suspicion about MRSA, vancomycin or linezolid can be included in the treatment. Colistin may be effective alone or in combination in the presence of resistant P. aeruginosa or *A. baumannii* [10]. In our patient, after the reproduction of Fusarium amphotericin B and voriconazole were initiated. Due to developing vascular access problems liposomal amphotericin treatment was stopped on the 15th day and voriconazole 200 mg tablet po 2x1 was initiated. Voriconazole p.o treatment was completed in a month so it was observed that the lesions were regressed entirely at the end of one month.

Foot infections are serious and prevalent complication of diabetes. Diabetic foot infections more than often develop out of polymicrobic origins. It should not be forgotten that despite its scarcity, fungus factors might give rise to diabetic foot infections and clinical examples should be evaluated in terms of fungus infections.

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