EFFECT OF CHANGE OF PH ON THE CONTROL OF THE INFECTION OF DIABETIC FOOT

THESIS

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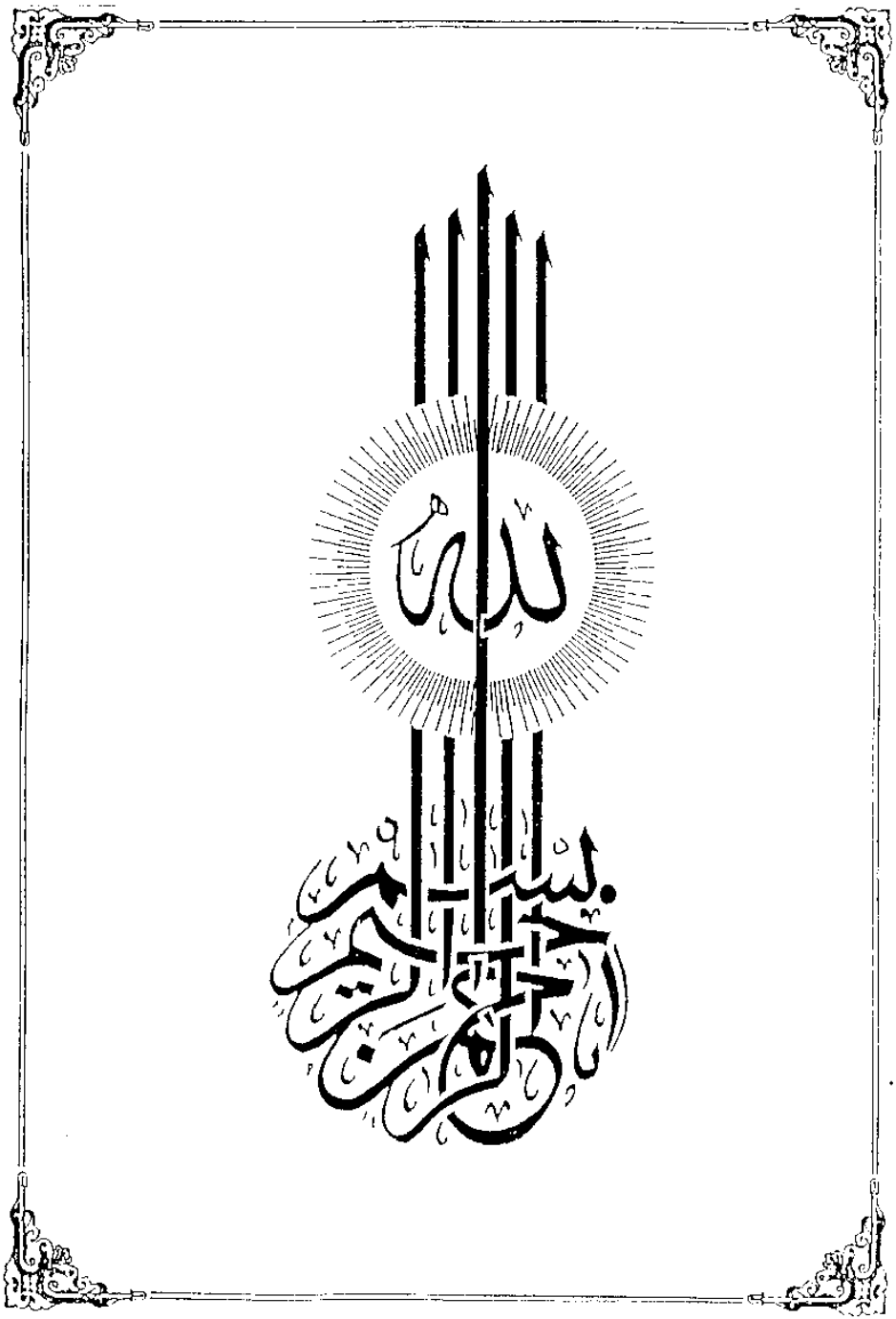

To everybody helped
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I N D E X

INTRODUCTION

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Diabetic foot infection is the most common cause of hospital admission in diabetic patients. However, the diabetic neuropathy and angiopathy play an important role in this situation.

Hyperglycaemia and the presence of skin changes in the diabetic foot are of great importance as predisposing factors in the diabetic foot infection.

In such predisposed foot, a trivial trauma may quickly lead to ulceration, infection and gangrene and to the most devastating complication, the amputation.

However, the other foot is considered as "at risk foot" so, it must be dealt with carefully and we must realize the fact that prevention is much more important than treatment.

Mixed polymicrobial infection is common in diabetic foot infection with the prominence of the anaerobic species.

However, the infection of the foot may take

different types such as cellulitis, web space infection, deep space or plantar infection in the form of neuropathic ulcer.

The anatomical peculiarities of the foot with its tense fascial plantar envelope which entraps the inflammatory cellular exudate under tension, with its muscle layers and potential fascial spaces and with the long tendons causing a higher spread of infection from the sole to the leg in the neglected cases. However, the presence of vascular affection in various degrees is of an importance in adding to the morbidity and mortality of diabetic foot patients.

The presence of underlying boney affection and uncontrolled blood glucose level, hinder the rate of healing of such lesions.

Many doctors advised the usage of wet dressings and local antibiotic and antimicrobial creams. Other doctors, on the other hand, advised the usage of dry dressings in the local management of the diabetic foot lesions. However, in our work, aiming to control such types of infections through the change of pH of the infected wounds of the foot so that it will be unfavourable to

the growth of the infective organisms.

Finally, the diabetic foot is considered as a highly delicate and complicated problem which should be dealt with carefully and handled from the start by a specialist.

REVIEW OF LITERATURE

C

ANATOMY

ANATOMY

SKIN, FASCIA AND NERVE SUPPLY OF THE FOOT

The skin of the dorsum of the foot contains hair follicles, sweat glands and some sebaceous glands. The skin of the sole of the foot is about 5 mm in thickness, with the thickest areas covering the heel and distal metatarsals to sustain weight bearing effort. It has neither hair follicles nor sebaceous glands but have sweat glands.

The collagenous fibres of the dermis are connected to the deep fascia by dense fibrous septa.

The nails are cutaneous appendages. The nail folds constituting two paronychial potential spaces connected with each other posteriorly. Those spaces are frequently infected (Lawrence and O'Neal, 1983).

The deep fascia on the dorsum of the foot forms a "Y"-shaped condensation called the inferior extensor retinaculum which prevents the bow-stringing of the extensor tendons as they pass across the front of the ankle joint acting like an ankle strap.

The subcutaneous tissue in the sole differs from

that of the rest of the body in being more fibrous. Fibrous septa divide the tissue into small loculi which are filled with a rather fluid fat under tension, so that the tissue bulges. This makes a shock absorbing pad especially over the heel. The septa anchor the skin to the underlying plantar aponeurosis to improve the grip of the sole (Last, 1978).

The plantar aponeurosis is composed of dense white fibres running longitudinally from the heel to the toes. The foot is divided by the plantar aponeurosis into superficial and deep plantar spaces.

The superficial plantar space is further divided into web spaces, corresponding to the position of the webs of the toes, interdigital spaces and heel space, corresponding to the calcaneous. Web spaces are 4 triangular regions between the dorsal and plantar skin filled with loose fat that bulges between the divisions of the plantar fascia. Interdigital spaces are subcutaneous areas that lie between the five digital slips of the plantar aponeurosis. The shafts of the metatarsals border the spaces on the sides.

The deep plantar space is divided into central,

medial and lateral spaces by vertical fibrous intramuscular septa arising from the borders of the central part of the plantar aponeurosis.

The space between the medial and lateral intramuscular septa is the central deep plantar space. It is further subdivided by the four layers of plantar muscles. The space medial to the intramuscular septum is the medial deep plantar space and that lateral to the lateral intramuscular septum is the lateral deep plantar space.

Fibrous septa extend from the phalanges to the medial and lateral aspects of each toe.

Extensor digitorum brevis is the only muscle of the dorsum of the foot while the plantar aspect has four layers of muscles.

The lumbricals are in the second layer and attached to the flexor digitorum longus tendon transmit the infection from the web to the deep layers.

There is a communication between the sole and posterior leg compartment through a tunnel under cover