POSTOPERATIVE FUNGAL WOUND SEPSIS IN OBSTETRICS AND GYNAECOLOGY AIN SHAMS MATERNITY HOSPITAL

THESIS

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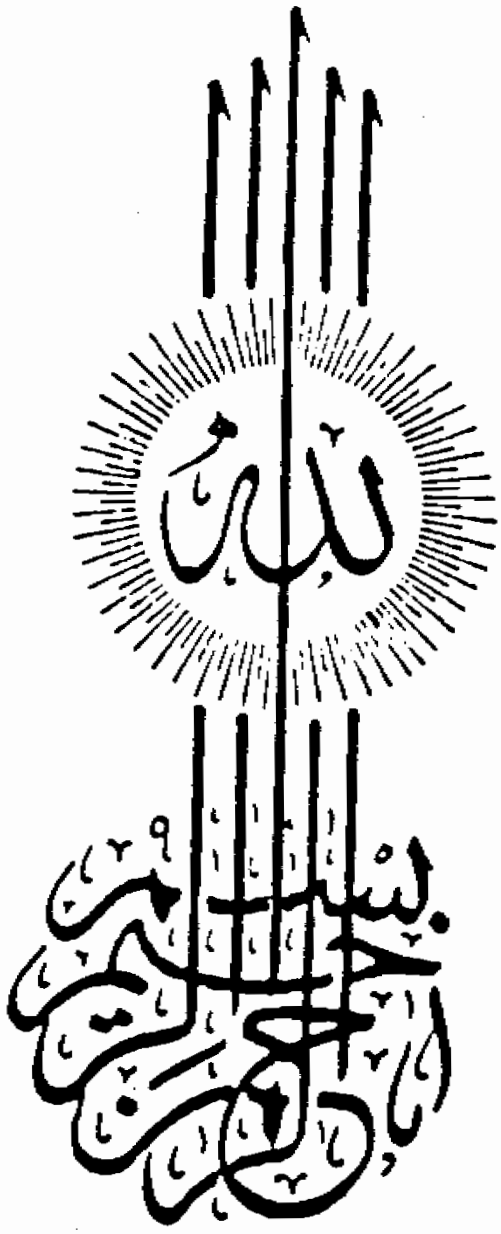
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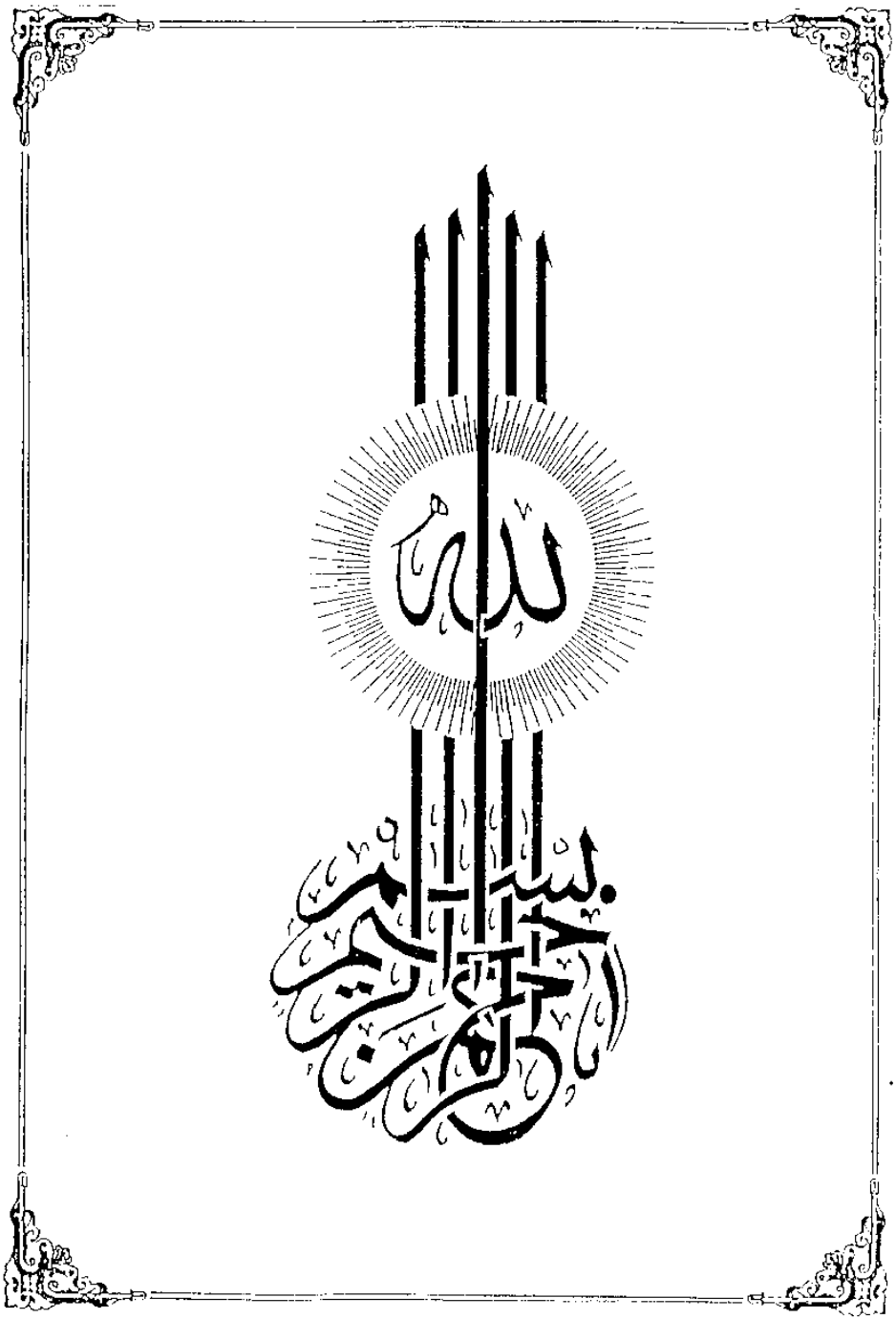

TO

MY FATHER AND MY MOTHER

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Moulds and fungi are very common in our environment. Some seems harmless while others may produce metabolites of toxic nature. Growth of opportunistic fungi in wounds were recorded, specially in association with immunodifficiney states, **Park et al. (1982).**

Infection has always been a prominent feature of human life, and sepsis in modern surgery continues to be a significant health problem throughout the world. So, postoperative wound infection remains one of the most troublesome complications following any surgical operation. It occurs at any center, even at those applying the most recent and strict antiseptic measures.One quarter to one half of the women having abdominal obstetrical operations especially cesarean section for delivery will develop postoperative infection, **James Harger et al. (1982).** In the past decade, many clinical studies of antibiotic prophylaxis have been conducted to demonstrate the efficacy of this method of preventing such infection, but most of them have had major limitations.

Postoperative wound infections increase the patient's morbidity, the surgeon's stress, the nurses duties and the economic burdens of the hospital budget besides allowing less number of patients to be operated upon.

Reduction of sepsis will be beneficial for the patients themselves, for the hospital staff and for the country as a whole.To achieve this reduction, many studies have been performed to find out the most important predisposing factors for postoperative wound infection and the best methods to reduce its incidence **(Hunt, 1977).**

This work was performed at Ain Shams Maternity Hospital, over 100 patients have undergone gynecological and obstetrical operations complicated with wound sepsis. The work was performed to find out the role of fungi as a causative agents of wound sepsis.

REVIEW OF LITERATURE

PROPERTIES AND CLASSIFICATION OF FUNGI

Historically, the fungi have been regarded as relatively insignificant causes of infection, however, during the past few years, the literatures have shown a sharp increase in the number of cases reported with fungal infections **(Roberts, 1986).**

Fungi : 100,000 species or more are among the most plentiful forms of life. They powder the earth and dust the atmosphere. About 100 species of fungi affect human beings and animals. Of these, at least 20 species cause potentially fatal diseases, 35 cause less sever systemic involvement, and 45 result in minor superficial infections of skin and mucous membranes **(Ainsworth et al., 1973).**

Fungi are quite distinctive at the cellular and molecular level. They possess an organized nucleus surrounded by a nuclear membrane, an eukaryotic nucleus. Unlike bacteria, most fungi grow slowly and their cell walls are composed of polysaccharide polymers such as glucan, mannan, cellulose and chitin. They reproduce sexually by fusion of two nuclei to produce sexual spores after meiosis, or asexually by the formation of conida and sporangiospores after mitosis **(Ainsworth, 1971).**

The relationship of fungi to bacteria, to plants and to animals has been studied and understood in new ways in

recent years. Taxonomists placed the fungi along with the bacteria and the algae, in a separate group, the protists which is subdivided into the prokaryotes and the eukaryotes. This classification was mainly based on the basis of the degree of development of their cellular organization. The bacteria and the blue-green algae are classified as prokaryotic protists. The more-advanced protozoa, slime moulds, fungi and algae are eukaryotic protists **(Copeland, 1956).**

Whittaker (1969) published his modified classification and this is the generally accepted classification at present. The Whittaker five Kingdoms are (1) Monera, the Prokaryotes (bacteria,actinomycetes and blue-green algae), (2) protista,which includes protozoa and other unicellular organisms,(3) fungi,(4) plantae and (5) Animalia **(Campbell and Stewart, 1980 and Rippon, 1982).**

The simplest morphologic form of the fungi is the unicellular, budding yeast. As complexity increases, the fungi grow as a mass of branching, interlacing filaments known as a mycelium. These mycelial forms are called moulds, few types, yeasts, do not form a mycelium but are easily recognized as fungi by the nature of their reproductive processes and by the presence of transitional forms **(Jawetz et al., 1989).**

Fungi are classified according to the microscopic morphology and type of reproduction as follows :

* Classification according to microscopic morphology :

Rippon (1982) classified fungi into 4 morphological groups :

a) Filamentous fungi : These are multicellular organisms whose cells are joined together to make up long,tube-like filaments called hyphae. The hyphae may be septate or co-encystic.As they multiply, the hyphae become interwined to form a mycelium of mouldy colony characterized by cottony, woolly, fluffy or powdery aerial growths above the culture medium. Dermatophytes are the most important members of filamentous fungi.

b) Yeasts : These are unicellular round or oval organisms which reproduce by simple budding. They produce opaque, creamy or pasty colonies. The only true pathogenic yeast is Cryptococcus neoformans.

c) Yeast-like fungi : These are a group of imperfect fungi which retain yeast like morphology under most circumstances but they can exhibit pseudomycelium formation under certain nutritional conditions. The yeast-like fungi are grouped together in the genus "Candida".

d) Dimorphic fungi : These are fungi which exhibit a mycelial morphology when grown at 25 to 30°C but they can develop as yeasts when cultivated at 37°C. Most systemic human pathogens exhibit dimorphism

Classification based on the method of reproduction :

According to Jawetz et al. (1989) :

Class I Zygomycotina (the phycomycetes)

Class II Ascomycotina (the Ascomycetes)

Class III Basidiomycotina (the basidiomycetes).

Class IV Deuteromycotina (the imperfect fungi).

The class zygomycotina includes organisms which have non septated hyphae and reproduce asexually by spores produced inside of sporangia and reproduce sexually by the production of zygospores and/or oospores. The most common members of this group are Mucor, Rhizopus and Absidia **(Jawetz et al., 1989).**

The class Ascomycotina includes organisms which have septated hyphae and reproduce asexually by production of conidia or reproduce sexually by means of ascospores produced within an ascus. The most common member of this group is Aspergillus species **(Jawetz et al., 1989).**

The class Basidiomycotina includes organisms which have septated hyphae and reproduce asexually by conidia or sexually by means of basidiospores.The most common members of this group of medical interest are Cryptococcus neoformans and Mushrooms **(Jawetz et al., 1989).**

The major class to which most of the clinically important fungi belong is the **Deuteromycotina** (Fungi imperfecti). This group of organisms has septated hyphae and

reproduces asexually with production of conidia whether their sexual reproduction is not known. The most common members are *Epidermophyton* and *Candida* (Jawetz et al., 1989).

Clinical classification of fungi :

Clinicians found more value in categorizing the fungi into three categories according to clinical manifestations of disease produced primarily :-

1) The superficial or cutaneous mycoses.
2) Subcutaneous mycoses.
3) Systemic mycoses.

The superficial or cutaneous mycoses are fungal infections that involve the hair, skin and nails without invasion of the subcutaneous tissue. The most commonly group recovered is the Dermatophytes. Subcutaneous mycoses are infections confined to the subcutaneous tissue without dissemination to distant sites (Rippon, 1982).

The systemic mycoses fall into two groups. These two groups are delineated by the interaction of two factors : inherent virulence of the fungus and constitutional adequacy of the host. The first group includes true Pathogenic fungi: Histoplasma, Coccidioides, Blastomyces and Paracoccidioides. Infections caused by these fungi involve the lungs primarily, but they may become widely disseminated