

**MYCOTIC INFECTION OF
URINARY TRACT**

ESSAY

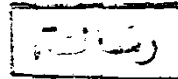
SUBMITTED FOR PARTIAL FULFILMENT OF
THE MASTER DEGREE IN UROLOGY

BY

WASEEM MOHAMED SAYED AHMED

SUPERVISORS

PROF. DR.



ABED EL WAHAB EL KASABY

PROF. OF UROLOGY

FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY

51862

DR. SHEREEN IBRAHIM RAGY

ASSISTANT PROF. OF UROLOGY

FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY



FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY

1991

Handwritten signature or initials.

Two large handwritten signatures at the bottom of the page.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ أَعْمَلُوا بِمَا يُرِي اللَّهُ عَلَيْكُمْ ذُرِّيَّتُيَ وَمَنْ يُؤْمِنُوا

تَهْدِي اللَّهُ الْمَنْطِقَ



ACKNOWLEDGMENT

I wish to express my deep gratitude to my professor DR. ABED EL WAHAP EL KASABY, Prof. of Urology, Faculty of Medicine, Ein Shams University, for his supervision, and for his interest in this work.

I am very much Thankful to the kindness of PROF. SHEREN IBRAHIM RAGY, Assist. Prof. of Urology, Faculty of Medicine, Ein Shams University, for his enthusiastic encouragement, for his guidance and the immeasurable time and effort devoted for the revision and correction of this work.

* * *

CONTENTS

	Page
* INTRODUCTION	1
* HISTORICAL NOTES.....	3
* MICROBIOLOGY OF FUNGUS RELATED TO THE URINARY TRACT..	5
* PREDISPOSING FACTORS.....	18
* SOURCES AND ROUTES OF INFECTION.....	29
* PATHOLOGY OF MYCOTIC INFECTION OF U.T.....	35
* SYMPTOMS AND SIGNS OF MYCOTIC INFECTION OF URINARY TRACT.....	51
* INVESTIGATIONS	57
* MANAGEMENT OF MYCOTIC INFECTION OF U.T.....	73
* SUMMARY	105
* REFERENCES.....	109
* ARABIC SUMMARY	

* * *



INTRODUCTION



INTRODUCTION

The implication of funguria is more or less well known and not so extensively studied. Many physicians seem to be rather hesitant about what to do when faced with a funguric patient. However, our present knowledge undoubtedly allows some guidelines to be drawn [*SchoNebeck, 1986*].

Fungal infections are of specific interest to the urologist because two types of patients are likely to come under his care: renal transplant recipients and those with mycotic involvement of the kidney, by altering immunologic defense mechanisms, the susceptibility to invasion by usually non pathogenic micro-organisms markedly increases. This increase has been particularly evident in recent years with definite rise noted in the incidence of serious disease caused by opportunists [*Warshawsky et al., 1975*]. It is not surprising that fungal infections are being recognized with increasing frequency in patients with urologic diseases [*Michigan, 1976*].

Renal metastases in a systemic fungal infection are common. In disseminated candidiasis the frequency is about 90% [*Lehner, 1964*], in cryptococcosis about 50% [*Salzer; 1973*] and in aspergillosis 19% [*Young et al., 1970*]. The reported incidences fungi in postive urine cultures are

varied from 0 to 4.8% and the majority of them are candida albicans [Guze and Haley, 1958; Haley, 1965; Seneca and Peer, 1965 and Price et al., 1967].

This assay is thus mainly confined to different aspects of fungal infections of the urinary tract as regarding predisposing factors, mycology, sources and routes of infection, symptoms and signs, investigations and lastly the treatment.

HISTORICAL NOTES

HISTORICAL NOTES

In 1846 Berg discovered that thrush was caused by the fungus now known as *candida albicans*. Shortly thereafter Virchow demonstrated that this was not merely a superficial pathogen but was at least capable of penetrating the submucosa of the oesophagus. In 1861, *Zenker* demonstrated fungal metastases to the brain and stated that they were probably spread hematogenously from thrush lesions. Autopsy reports demonstrated renal involvement in thrush infection in 1895 and 1905 [*Michigan, 1976*].

The first case of renal moniliasis was reported in 1910 by Raffin. Also, monilial arteritis was recognized in 1920 by him. The monilial cystitis with its typical clinical finding was described and reported in 1946 by Moulder. Albers described two cases of what has since been known as primary renal candidiasis in 1953. The first case of bilateral renal aspergillosis without dissemination was reported in 1975 by [*Warshawsky et al., 1975*]. Since that time large numbers of case reports of fungal infection of different parts of the genitourinary tract in a variety of clinical settings have been noted in the literature [*Michigan, 1976*].

The terminology for the clinical disease has also been controversial. Moniliasis is obviously untenable, since the genus that contained the aetiologic agents of the disease is invalid. The term candidiasis came into common use in the United States, but in Canada, England, France and Italy, the term "Candidosis" had been accepted as the more desirable descriptive term. For consistency, the term candidosis is preferable, but candidiasis is used presently in most of the world [Rippon, 1982].

Goldman and Associates (1960), were the first to report the use of amphotericin B as bladder irrigation in the management of candidal cystitis. *Irby and Associates (1990)*, were the first to report the use of the itraconazole in the treatment of kidney bezoars.

***MICROBIOLOGY OF FUNGUS
RELATED TO THE
URINARY TRACT***

MICROBIOLOGY OF FUNGUS RELATED TO THE URINARY TRACT

Characteristic of fungi:

As defined by Ainsworth (1965) and Modified by Ragan and Chapman (1977), and McGinnis (1980), fungi have the following diagnostic characteristic.

Nutrition: heterotrophic and absorptive. **Thallus:** on or in the substrate; unicellular or filamentous (mycelial); aseptate, partially septate, or septate; Typically nonmotile but some have a flagellated stage (Zoospores). The flagellum is of the whiplash type and thus the 9-2 fibril construction. **Cell wall:** a well defined structure containing polysaccharids, sometimes polypeptides and typical chitin. **Nuclear state :** eukaryotic, uninucleate, or multinucleate, the mycelium may be homo-or heterokaryotic, haploid, dikaryotic, or diploid. **Life cycle:** simple or complex. **Sexuality:** asexual or sexual and homothallic or heterothallic. **Sporocraps:** simple, naked and microscopic to complex within large carps and showing limited (pseudoparenchymatous) tissue differentiation. **Habitat** on any organic material as saprobes, symbionts, parasites or hyperparasites and of universal distribution in water and in soil. The simplest morphologic form of the fungi is the unicellular, budding yeast. As complexity increases elongation of the cell without separation of newly formed cells results in the

thread like hyphae. An intertwined mass of hyphae is called a mycellium. The popular term of mold (mould) also refers to the filamentous fungi. The terms "hyphae" and "mycelia" are used interchangeably. The thalus is a loose network of hyphae, also called a colony. Reproductive units are of several types. Spores are the units resulting from sexual mechanisms of reproduction or are produced asexual in sac like swelling, called sporangia. In some groups spores are motile. Conidia are asexual, non motile, commonly deciduous propagules produced. In some higher forms of fungi, the hyphae are cemented together to form large, structurally complex fruiting bodies such as mushrooms and puffballs, which may weight more than 60 pounds [Rippon, 1982].

Yeasts defined morphologically, yeast is a single-celled fungus that reproduces by simple budding [McGinnis, 1980]. Under ordinary conditions, the life cycle of this fungus is spent as single-celled budding structure although it may elongate to form a pseudomycelium under the influence of certain environment conditions and in some cases a true mycelium.

The true pathogenic fungus infections and the opportunistic fungus infections :

The systemic diseases caused by fungi fall into two categories. The first includes infections caused by the true

pathogenic fungi : Histoplasma, coccidioides, Blastomyces, and paracoccidioides. The second group of infections are termed "opportunistic" because the organisms involved are of inherently low virulence, and disease production depends on diminished host resistance to infection. The common etiologic agents of opportunistic infections are Aspergillus, candida and cryptococcus [Rippon, 1982].

True pathogenic fungus infections :

The true pathogenic fungi are those species that have ability to elicit a disease process in the normal human host when the inoculum is of sufficient size. In recent years it has been determined that the vast majority of such infection usually more than 90%, are either completely asymptomatic or of very short duration and quickly resolved. In the few individual who have residual or chronic infection. the usual cellular response is a granulomatous process resembling that seen in tuberculosis [Rippon, 1982].

The opportunistic fungus infections :

The organisms involved have low inherent virulence, and the patient's defences must be abrogated before infection is established. In recent years they have become much more common and of great medical significance due to increase factors that affect resistance of the host. The usual