



Epidemiology of Fungal Infections in Diabetic Patients

Thesis

**Submitted in Partial Fulfillment of the Requirement for the Degree of
M.Sc. in Microbiology**

By

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(B.Sc. Microbiology, 1999)

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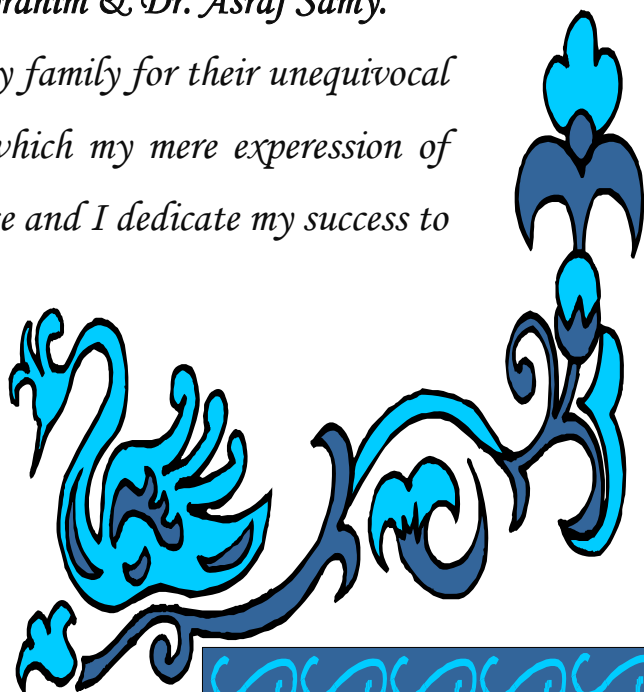
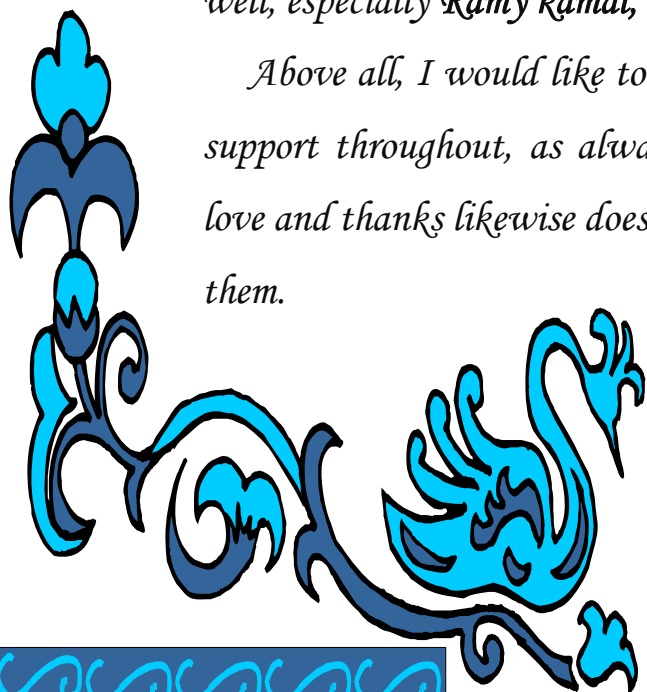
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Special Thanks

This is for my family

Dad, Mom, My husband Hatem

& My Kids Ehab and Ahmed

Thanks for always being

There for me

I certify that the thesis titled “Epidemiology of Fungal Infection in Diabetic Patients” is my own work. The work has not been presented elsewhere for assessment. Where material has been used from other sources it has been properly acknowledged / referred

Signed

Rasha El Nemaky



Table of contents

	Page
List of tables.....	I
List of figures.....	II
Abstract.....	
Introduction.....	1
Aim of work.....	6
Review of literature.....	8
Materials and methods	29
I. Study population.....	29
II. Specimens collection and culturing.....	29
III. Identification of the obtained isolates.....	30
a. Conventional methods for yeast & yeast-like isolates identification.....	30
b. Morphological methods for filamentous isolates identification.....	34
c. Molecular Identification methods.....	35
IV. Statistical analysis.....	38
V. Microbiological media and reagents used.....	39
Result	44
Demographic data analysis of the study population.....	44
Frequency of fungal infections among study population.....	49
Clinical presentations of fungal infections among study population.....	53
Identification of the recovered etiologic agents.....	55
Frequency of the recovered etiologic agents.....	95
Frequency of the recovered etiologic agents respective to underlying diseases	99
Discussion	101
Summary	109
References	113

List of Tables

	page
Table (1). Clinical specimens collected from sterile sites.....	31
Table (2). Clinical specimens collected from non-sterile sites.....	31
Table (3). Underlying diseases of the study population at time of infection.....	45
Table (4). Demographic characteristics of the study population. I. Gender.....	46
Table (5). Demographic characteristics of the study population. II. Age.....	47
Table (6). Frequency of positive cultures obtained from sterile sites specimens.....	48
Table (7). Frequency of positive cultures obtained from non-sterile sites specimens.....	48
Table (8). Frequency of fungal infections among the study population.....	50
Table (9). Distribution of positive fungal infections cases according to gender of the study population.....	51
Table (10). Distribution of positive fungal infections cases according to age of the study population....	52
Table (11). Clinical presentation of fungal infections among study population.....	54
Table (12). Etiologic groups recovered from positive cases	97
Table (13). Frequency of recovered etiologic agents respective to infection sites.....	98
Table (14). Frequency of recovered etiologic agents respective to infection sites.....	100

List of Figures

	page
Figure (1). Underlying diseases of the study population at time of infection.....	45
Figure (2). Demographic characteristics of the study population. I. Gender.....	46
Figure (3). Demographic characteristics of the study population. II.Age.....	47
Figure (4). Frequency of fungal infections among the study population.....	50
Figure (5). Distribution of positive fungal infections cases according to gender of the study population.....	51
Figure (6). Distribution of positive fungal infections cases according to age of the study population.....	52
Figure (7). Clinical presentation of fungal infections among study population.....	54
Figure (8). Macroscopic and microscopic characteristics of <i>Candida albicans</i> . Cream-colored colony, budding cells subspherical, blatoconidia in dense grape-like arrangement, chlamydospores dark, spherical and mostly terminal.....	57
Figure (9). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>C. albicans</i> (GenBank Accession No. JN60639) and recovered <i>C. albicans</i> strain.....	58
Figure (10). Macroscopic and microscopic characteristics of <i>Candida tropicalis</i> . Off white colony, ellipsoidal budding cells, abundant pseudomycelium, conidia arranged in small groups around the middle of each cellular element.....	60
Figure (11). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>C. tropicalis</i> (GenBank Accession No.JF896569) and recovered <i>C. tropicalis</i> strain.....	61
Figure (12). Macroscopic and microscopic characteristics of <i>Candida parapsilosis</i> . Cream-colored to yellowish colony, abundant pseudomycelium, consisting of branched chains of elongate cells in more or less Christmastree-like arrangement. Lateral branches gradually becoming shorter towards the hyphal apex.....	63
Figure (13). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>C.parapsilosis</i> (GenBank Accession No.JF896569) and recovered <i>C. parapsilosis</i> strain.....	64

Figure (14). Macroscopic and microscopic characteristics of <i>Candida glabrata</i> . Cream-colored colony, budding unipolar cells regularly ellipsoidal, typically arranged in dense groups.....	66
Figure (15). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>C. glabrata</i> (GenBank Accession No. JN391279) and recovered <i>C. glabrata</i> strain.....	67
Figure (16). Macroscopic and microscopic characteristics of <i>Trichosporon inkin</i> . White, cerebriform, restricted colony. Long cylindrical arthroconidia, appressoria and sarcinae.....	69
Figure (17). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Trichosporon inkin</i> (GenBank Accession No.FJ695475) and recovered <i>Trichosporon inkin</i> strain.....	70
Figure (18). Macroscopic and microscopic characteristics of <i>Geotrichum candidum</i> . White colony is rapidly expanding. Expanding hyphae are often with di or trichotomous branching. Lateral branches soon disarticulating into short-cylindrical cells which slightly inflate.....	72
Figure (19). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Geotrichum candidum</i> (GenBank Accession No.HQ436462) and recovered <i>Geotrichum candidum</i> strain.....	73
Figure (20). Macroscopic and microscopic characteristics of <i>Aspergillus flavus</i> . Yellowish-green colony, radiate conidial heads, conidiogenous cells are uni and bi-seriate. Conidiophores are rough-walled, hyaline. Vesicles are spherical, conidia echinulate and spherical.....	75
Figure (21). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Aspergillus flavus</i> (GenBank Accession No.JX028197) and recovered <i>Aspergillus flavus</i> strain.....	76
Figure (22). Macroscopic and microscopic characteristics of <i>Aspergillus niger</i> . Black colony, radiate conidial heads, conidiophores are smooth-walled, hyaline or pigmented. Vesicles are subspherical, conidiogenous cells are bi-seriate, metulae are twice as long as the phialides. Conidia are brown, ornamented, with warts.....	78
Figure (23). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Aspergillus niger</i> (GenBank Accession No.KF358715) and recovered <i>Aspergillus niger</i> strain.....	79
Figure (24). Macroscopic and microscopic characteristics of <i>Aspergillus fumigatus</i> . Dark blue-green colony, columnar conidial heads, conidiophores are smooth-walled. Vesicles are sub clavate, conidiogenous cells are uni-seriate. Conidia are verrucose and subspherical.....	81

Figure (25). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Aspergillus fumigatus</i> (GenBank Accession No.KF201647) and recovered <i>Aspergillus fumigatus</i> strain.....	82
Figure (26). Macroscopic and microscopic characteristics of <i>Fusarium oxysporum</i> . Colonies initially white turned purple in age. Conidiophores are single and short with lateral monophialides. Macroconidia fusiform, slightly curved, pointed at the tip, 3-5 septate. Microconidia are abundant, ellipsoidal to cylindrical, straight or often curved. Chlamydospores are terminal or intercalary, hyaline and smooth.....	84
Figure (27). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Fusarium oxysporum</i> (GenBank Accession No.JX028197) and recovered <i>Fusarium oxysporum</i> strain.....	85
Figure (28). Macroscopic and microscopic characteristics of <i>Fusarium moniliforme</i> . Pale rose to cream colony. Globose or clavate microconidia formed in globose heads from simple and polyphialides. Macroconidia slightly sickle-shaped to almost straight, 3-5-septate, basal cells foot shaped.....	87
Figure (29). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcribed spacers (ITS1 and ITS2) of <i>Fusarium moniliform</i> (GenBank Accession No.KC895528) and recovered <i>Fusariumoxysporum</i> strain.....	88
Figure (30). Macroscopic and microscopic characteristics of <i>Rhizopus oryzae</i> . White to grey colony, wide hyaline stolons, abundant rhizoids and unbranched sporangiophores terminated with round black sporangia.....	90
Figure (31). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcript spacers (ITS1 and ITS2) of <i>R. oryzae</i> (GenBank Accession No. EU484274) and recovered <i>R. oryzae</i> strain.....	91
Figure (32). Macroscopic and microscopic characteristics of <i>Lichthemia corymbifera</i> . White to brown colony, branched sporangiophores. Pear shaped sporangia with conical columella and rounded to oval conidia.....	93
Figure (33). Interspecific alignments of the 5.8S ribosomal DNA and the flanking internal transcript spacers (ITS1 and ITS2) of <i>L. corymbifera</i> (GenBank Accession No. HM104216) and recovered <i>L. corymbifera</i> strain.....	94
Figure (34). Etiologic groups recovered from positive cases.....	97
Figure (35). Frequency of recovered etiologic agents respective to infection sites.....	98
Figure (36). Frequency of recovered etiologic agents respective to underlying diseases.....	100

List of Abbreviation

DM : Diabetes Mellitus

GI : Gastrointestinal

T1DM: Type 1 Diabetes Mellitus

T2DM: Type 2 Diabetes Mellitus

UTIs: Urinary tract infections

CNS: Central nervous system

DLWs: Diabetic lower-limb wounds

ITS: Intertranscribed spacer regions

NTS: Nontranscribed spacer

COPD : Chronic obstructive pulmonary disease patients

Asth. Bron. : Asthmatic bronchitis

Bact. Infec. : Bacterial infection

Myoc. Infr. : Myocardial infraction

AF : Atrial fibrillation hypertension

RF : Renal failure

LCF : Liver cell failure

D. Foot : Diabetic foot

Abstract

This study aimed to investigate the epidemiology of fungal infections in hospitalized diabetic patients. A total of 220 diabetic patients hospitalized in Ain Shams University Specialized Hospital and Wadi El Neel Hospital in Cairo, Egypt during 2010 – 2012 were included this study. The results obtained showed that 96 (43.6%) cases were positive fungal infection, while 124 (56.4%) were negative. A total of 55 positive cases were male patients (57.3%) while 41 positive cases were female (42.7%). A total 55 positive cases were less than 50 years old (57.3%) while 41 positive cases were more than 50 years old (42.7%). The highest number of etiologic agents were recovered from diabetic patients suffering from COPD disease where 22 fungal isolates were recovered represented by (22.9%) followed by bacterial infection patients 20 fungal isolates were recovered (20.8%). The least number of fungal isolates were recovered from diabetic patients suffering from liver cell failure where only 2 isolates were recovered (2.1%). Yeast and

yeast like group were the most frequently encountered etiologic agents where they were recovered from 76% of cases followed by *Aspergillus* group which represented 16.7% of the cases. *Fusarium* group came next by 4.2% and finally *Zygomycetes* group by 3.1%. Among yeast and yeast like group, *C. albicans* was the most frequently isolated etiologic agent where it was recovered from 35 cases (36.5%) followed by *C. tropicalis* which recovered from 30 cases representing (31.3%). *C. parapsilosis* Came next by (4.2 %) followed by *T. inkin* by (2.1%) and finally both *C. glabrata* and *G. candidum* were recovered each from 1 case only by (1%). 3 species of *Aspergillus* where recovered, *Aspergillus flavus* was the most frequently recovered as isolated from 10 cases (10.4%) followed by *Aspergillus niger* which represented (4.2%) while *Aspergillus fumigatus* isolated from 2 cases represented (2.1%). *Fusarium* group represented by 2 species, *Fusarium oxysporum* and *Fusarium moniliform* and they were equal in their frequency where both of them recovered from 2 cases each and *Fusarium* infections representing (4.2%). *Zygomycetes* group representing (3.1%).

Lichthemia corymbifera can recovered from 2 cases (2.1%) from patients suffering from bacterial infections while *Rhizopus oryzae* isolated once only (1%) from patient suffering from COPD. Diabetic patients are of high risk for fungal infections. Permanent examination of diabetic patients to look for clinically evident fungal infections and elimination of pathogens in each predilections site should be carefully considered.

Introduction

Diabetes mellitus (diabetes) is a group of metabolic diseases in which a person (diabetic) has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger).

There are three main types of diabetes:

Type 1 diabetes: results from the body's failure to produce insulin, and requires the person to inject insulin.

Type 2 diabetes: results from insulin resistance, a condition in which cells fail to use insulin properly.

Gestational diabetes: is when pregnant women, who have never had diabetes before, have a high blood glucose level during pregnancy.

Other forms of diabetes mellitus include congenital diabetes, which is due to genetic defects of insulin secretion, cystic fibrosis-