Epidemiology of Fungal Infections in Diabetic Patients

Thesis

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

By

Rasha Mostafa Mohamed Aziz El-Nemaky

(B.Sc. Microbiology, 1999)

Department Of Microbiology

Faculty of Science

Ain Shams University

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Supervised by

Prof. Dr. Mohamed Abo Zaied

Prof. of Microbiology

Microbiology Department

Faculty of Science, Ain Shams University

Dr. Sherif M. Zaki

Assistant Prof. of Microbiology

Microbiology Department

Faculty of Science, Ain Shams University

Dr. Iman M. A. El-Kholy

Assistant Consultant of Microbiology

Ain Shams University Specialized Hospital

Ain Shams University

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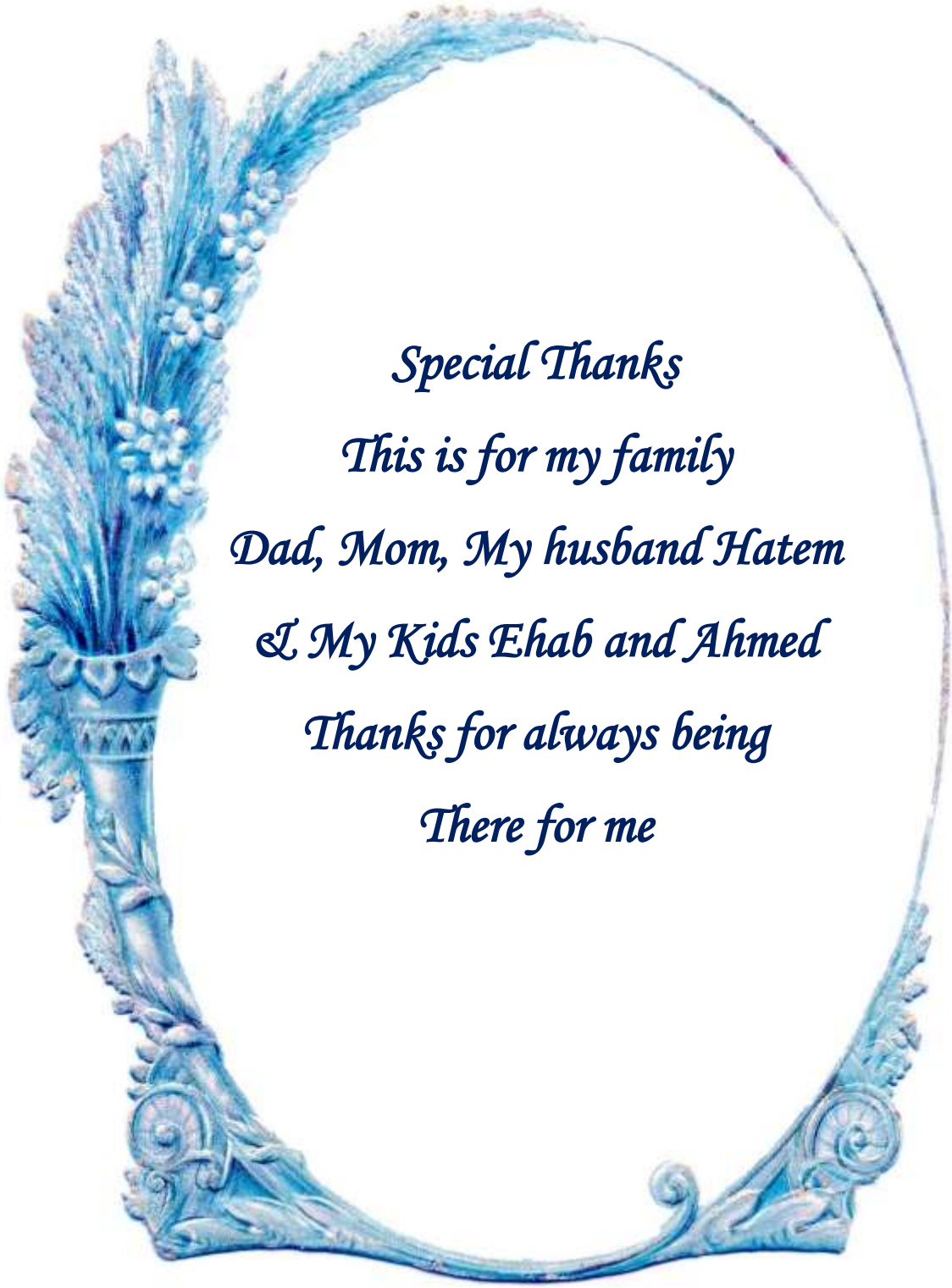

Special Thanks

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

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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: Interal transcribed 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 flavu*s 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%).

Abstract

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-