Study of Markers of Oxidative Stress and Reducing Substance during the Course of Diabetic Ketoacidosis in Diabetic Children and Adolescents

Thesis

Submitted for Partial Fulfillment of Master Degree in Pediatrics

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2019

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH,** *the Most Kind and Most Merciful.*

I wish to express my deepest thanks, gratitude and appreciation to **Prof. Dr. Mohsen Elalfy,** *Professor of Pediatric Faculty of Medicine – Ain Shams University for his meticulous supervision, kind guidance, valuable instructions and generous help.*

Special thanks are due to **Dr. Hanan Hassan Aly,** *Lecturer of Pediatrics Faculty of Medicine – Ain Shams University for her sincere efforts, fruitful encouragement.*

I am deeply thankful to **Assist. Prof. Dr. Salah Ibrahim,** *Assistant Professor of Pediatrics Faculty of Medicine – Al-Azhar University for his great help, outstanding support, active participation and guidance.*

Iman Mohamed Naguib

Dedication

Words can never express my sincere thanks to ***My Family and My Loving Fiancé*** *for their generous emotional support and continuous encouragement, which brought the best out of me. I owe them all every achievement throughout my life.*

I would like to express my everlasting gratitude to all ***My Professors, Colleagues and Friends****, so many of them influenced, encouraged and inspired me throughout the years. I wish them the best of all.*

Also, I would like to express my greatest and everlasting gratitude to ***Professor Fatma Ibrahim*** *as she supported me and gave me great hope to accomplish this study. May God bless her.*

I would like also to thank the ***Patients*** *who agreed willingly to be part of my study and without them; I would not have been able to accomplish this work.*

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List of Abbreviations

Abb.	Full term
CAT	*Catalase*
Cu	*Cupper*
DAG	*Diacylglycerol*
DKA	*Diabetic ketoacidosis*
DM	*Diabetes mellitus*
G6PD deficiency	*Glucose 6 phosphate dehydrogenase deficiency*
GPX	*Glutathione peroxidase*
GSH	*Reduced glutathione*
HbA1c	*Glycated hemoglobin*
LDL	*Low density lipoproteins*
MDA	*Malondialdehyde*
NADPH	*Nicotinamide adenine dinucleotide phosphate*
ROS	*Reactive oxygen species*
SMBG	*Self-monitored blood glucose*
SOD	*Superoxide dismutase*
Zn	*Zinc*

INTRODUCTION

Diabetes mellitus is one of the most common metabolic disorders among the pediatric age group ***(Guariguata et al., 2014).*** It can be described as a disorder where there are multiple factors that play a role in its pathogenesis including genetic predisposition as well as environmental factors ***(Maahs et al., 2010).*** Furthermore, these environmental factors include: infection, breastfeeding, psychological stress and birth weight ***(Virtanem, 2016).*** This genetic predisposition in addition to the mentioned factors trigger the autoimmune response against the pancreatic beta cells which eventually lead to their destruction ***(Guariguata et al., 2014).***

Diabetic ketoacidosis is a very common, and a potentially life threatening complication of diabetes mellitus type 1. patients usually present with nausea, abdominal pain, respiratory distress, dehydration, and disturbed conscious level ***(NICE guidelines, 2015).*** Not only that, but unfortunately it could be the first presentation in newly diagnosed patients, and is actually the number one indication for hospitalization of children with diabetes mellitus type 1 ***(Cemil Kaya, 2015).***

The islets cells of pancreas are highly susceptible to oxidative stress either endogenous, or exogenous. This eventually lead to their dysfunction and death. For example, throughout the respiratory chain in the inner membrane of the most important source of reactive oxygen species which is the