Dedication

To my mother……

To my father……

To my brothers……..

To my sisters……

To my friends……

And my colleagues…

I dedicate this work with my best wishes to all.

Acknowledgements

All my thanks are in the name of Allah, the most Gracious and the most Merciful.

I would like to express my deep sincere gratitude and honest appreciation to my supervisor **Dr. Samia Mahdi Ahmed**, Faculty of medical laboratory science, Sudan University of Science and Technology, for her efforts on supervision and guidance, encouragement and support throughout this work in completing this study. Her ultimated help, constant care and valuble comments and suggestions are highly appreciated. I am indebted to her kind cooperation.

My grateful thanks also extended to **Professor Imad Fadl-Elmula**, dean Faculty of Medical Laboratory Science, Alneelain University, who has been a source of knowledge, advice, support and inspiration.

I am also grateful to all staff of integrated management of diabetic children at Wad Medani

Paediatric Teaching Hospital, specially my colleague **Abubakr Osman** who offered his kind assistance and provided me the necessary information and investigations.

I extent my appreciation to all those who provided me with different materials and help.

Abstract

The aim of this study was to determine the seroprevalence of celiac disease (CD) among type 1 diabetic children.

Across sectional hospital based study was carried out in integrated management of diabetic children at Wad medani paediatric teaching hospital. From October 2008 to February 2009, 145 patients with type 1 diabetes, 66 males (aged 3 to 19 years) and 79 females (aged 5 to 19 years), were screened for CD using anti-tissue transglutaminase antibody (t-TGA) determined by ELISA. Clinical data, hemoglobin Alc, insulin requirements were evaluated.

Nine (6.2%) patients were positive for (t-TGA) giving a prevalence of CD in diabetic children of 2.9%.

The prevalence of CD was found higher than expected. The females were more affected by CD than males. Serologic markers for CD are useful for identifying asymptomatic type 1 diabetes children who should undergo intestinal biopsy.

هدفت هذه الدراسة الى تحديد إنتشار الداء البطانى (celiac disease) لدى الأطفال المصابين بداء السكر من النوع 1.

إجريت هذه الدراسة المقطعية المستشفوية المرتكز، فى مشروع العلاج المتكامل لمرضى السكر عند الأطفال، بمستشفى ود مدنى التعليمى للأطفال. تم المسح للداء البطانى على 145 مريض بداء السكر من النوع 1، 66 ذكر تتراوح أعمارهم من 3 إلى 19 سنة، و79 أنثى تتراوح أعمارهن من 5 إلى 19 سنة فى الفترة ما بين أكتوبر 2008 الى فبراير 2009 بواسطة المقايسة المناعية الأنزيمية (ELISA) بإستخدام الجسم المضاد المعادية ل (t-TGA) transglutaminase). تم تقييم البيانات السريرية، هيموغلوبين Alc ومتطلبات الأنسيولينِ للمرضى.

فقد وضح من الدراسة أن تسعة (6.2 %) مرضى كانوا إيجابيون ل(t-TGA) يمثلون إنتشار الداء البطانى في الأطفالِ المرضى بالسكرِ بنسبة إنتشار 2.9 %.

إنتشار الداء البطانى وُجِدَ بنسبة أعلي من المتوقع. الإناث كُنّ أكثر تأثُراً بالداء البطانى مِنْ الذكور. العلامات السيرولوجية للداء البطانى مفيد لتَمييز الأطفالِ المصابين بداء السكر الذين لا تظهر عليهم الأعراضِ، ويخضعون لإجراء خزعات معوية.

List of Contents

Chapter Three

Chapter Four

Chapter Five

List of tables

List of figures

List of abbreviations

AACE	American Association of Clinical Endocrinology
Ab	Anti-body
ADA	American Diabetes Association
AGA	Anti-gliadin antibody
ARA	Anti-reticulin antibody
BMI	Body mass index
CBC	Complete blood count
CD	Celiac disease
CD4	Cluster of differentiation
CRP	C-Reactive protein
DH	Dermatitis herpetiformis
DM	Diabetes mellitus
EDTA	Ethylene diamine tetraacetic Acid
ELISA	Enzyme-linked Immunosorbent assay
EMA	Endomysium antibody
ESPGAN	European Society for Paediatric Gastroenterology and Nutrition
ESR	Erythrocyte sedimentation rate
GAD	Glutamic acid decarboxylase
GFD	Gluten free diet
GSE	Gluten sensitive enteropathy

HbA1c	Glycosylated haemoglobin
HLA	Human leucocytes antigen
HUC	Human umbilical cord
ICA	Islet cell antibodies
IDDM	Insulin-dependant diabetes mellitus
IDF	International Diabetes Federation
IF-γ	Interferon gamma
IgA	Immunoglobulin A
IgA-GA	Immunoglobulin A gliadin antibody
IgG	Immunoglobulin G
IMDC	Integrated management of diabetic children
MOE	Monkey oesophagus
NIDDM	Non-insulin-dependent diabetes mellitus
NOD	Non-obese diabetic
OD	Optical density
SDS	Standard deviation scores
SPSS	Statistical Package for the Social Sciences
T1DM	Type 1 diabetes mellitus
T2DM	Type 2 diabetes mellitus
TJs	Tight junctions
TMB	Tetramethylbenzidine
TNF-α	Tumor necrosis factor alpha
t-TGA	Tissue transglutaminase antibody
u/kg/d	Unit/kilogram/day
UKPDS	United Kingdom Prospective Diabetes Study
WHO	World Health Organization
WROB	Wheat**,** Rye, Oat and Barely