Anti Glutamic Acid Decarboxylase 65 in Type 2 Diabetes Mellitus

Thesis

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By

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Ibrahim Salama Ibrahim Ali

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List of Abbreviations

Abbr.	Full-term
Ab+	Antibody positive
ACE	Angiotensin converting enzyme
ACR	Albumin:creatinine ratio
ADA	American Diabetes Association
AER	Albumin excretion rate
AGREE	Appraisal of Guidelines for Research and Evaluation
BDR	Background diabetic retinopathy
BFST	Behavioural family systems therapy
BMI	Body mass index
BMI-SDS	Body mass index – standard deviation score
BSPED	British Society for Paediatric Endocrinology and Diabetes
CASCADE	Child and Adult Structured Competencies Approach to Diabetes Education
CBT	Cognitive behavioural therapy
CGMS	Continuous glucose monitoring system
CHF	Chronic heart failure
CI	Confidence interval
CO2	Carbon dioxide
CSII	Continuous subcutaneous insulin infusion
CST	Coping Skills Training
CVD	Cardiovascular disease
DCCT	Diabetes Control and Complications Trial
DKA	Diabetic ketoacidosis
DQOLY-SF	Diabetes Quality of Life for Youth – Short Form
ECG	Electrocardiogram
ECMO	Extracorporeal membrane oxygenation
EDIC	Epidemiology of Diabetes Interventions and Complications
EED	Economic Evaluation Database

eGFR	Epidermal growth factor receptor
ESRD	End-stage renal disease
FPG	Fasting plasma glucose
GABA	gamma-Aminobutyric acid
GAD	Anti-glutamic acid decarboxylase
GAD65,	Glutamic acid decarboxylase autoantibody 65
GAD65+	(positive)
GADA	Anti-glutamic acid decarboxylase antibody
GP	General practitioner
GRADE	Grading of Recommendations Assessment, Development and Evaluation
GRP	Guideline review panel
HAEM	Haemoglobin
HbA1c	Glycatedhaemoglobin
HDL	High-density lipoprotein
HR	Hazard ratio
HTA	Health Technology Assessment
IAA	Insulin autoantibody
IA-2	Insulinoma-associated autoantibody
IA-2A+	Insulinoma-associated autoantibody-positive
IA-2β-A	Insulinoma-associated beta autoantibody
ICA	Islet-cell antibodies
ICA512	Anti-islet cell antibody 512
ICER	Incremental cost effectiveness ratio
ICU	Intensive care unit
IFCC	International Federation of Clinical Chemistry
IGRP	Islet-specific glucose-6-phosphatase catalytic subunit
IQR	Interquartile range
ISPAD	International Society for Pedatric and Adolescent Diabetes
ITU	Intensive care unit
KICk-OFF	Kids In Control OF Food
LADA	Latent autoimmune diabetes of adulthood
LDL	Low-density lipoprotein
LVH	Left ventricular hypertrophy

MA	Microalbuminuria
MCMC	Markov chain Monte Carlo
MD	Mean difference
MDI	Multiple daily injection
ME	Macular oedema (edema)
MI	Myocardial infarction; Multiple injections (see context)
MID	Minimally important difference
MIMS	Monthly Index of Medical Specialities
MMTT	Mixed meal tolerance test
MODY	Maturity onset diabetes of the young
MRI	Magnetic resonance imaging
MST	Multisystemic therapy
NA	Not applicable
NC	Not calculable
NCC	National Collaborating Centre
NCC-WCH	National Collaborating Centre for Women's and Children's Health
NCGC	National Clinical Guideline Centre
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NPH	neutral protamine Hagedorn
NPSA	National Patient Safety Agency
OR	Odds ratio
PDR	Proliferative diabetic retinopathy
PDSN	Paediatric diabetes specialist nurse
PedsQL	Paediatric quality of life
PSA	Probabilistic sensitivity analysis
PVD	Peripheral vascular disease
QALY	Quality adjusted life years
QUADAS	Quality Assessment of Studies of Diagnostic Accuracy
RCT	Randomised controlled trials
RR	Relative risk
SBP	Systolic blood pressure
SD	Standard deviation

SDS	Standard deviation score
SMBG	Self-monitoring of blood glucose
SMD	Standardised mean difference
SVL	Severe visual loss
T1D	Type 1 diabetes
T2D	Type 2 diabetes
TRIG	Triglycerides
UCPCR	Urine C-peptide:creatinine ratio
UKPDS	UK Prospective Diabetes Study
VTE	Venous thromboembolism
WBC	White blood cells

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Introduction

Diabetes mellitus is a complex, chronic illness requiring continuous medical care with Multi factorial risk-reduction strategies beyond glycemic control. Ongoing patient self-management education and support are critical to prevent acute complications and reduce the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes **(William, 2017).**

For type 2 diabetes, there are few usual highly specific indicators, though the presence of risk factors such as obesity indicates the likelihood of developing type 2 diabetes. Hopefully, future research will reveal some specific markers of the type 2 diabetic disease process **(Kadiyala et al., 2010).**

For the most part, in type 2 diabetic patients, positivity for Glutamic acid decaboxylase autoantibodies, as well as autoantibodies to other islet cell antigens, correlates with some of the phenotypic features consistent with those of type 1 diabetes, such as younger age at diagnosis, lower body mass index (BMI), and a loss of B-cell function. This form of disease with initial type 2-like diabetes presentation and with serological evidence of islet cell autoimmunity has been termed latent autoimmune diabetes, or type 1.5 diabetes, and has been associated with progressive decline in B-cell

function and future insulin requirement in some population **(Barinas-Mitchell et al., 2004).**

However, no study to date has assessed the progression to insulin deficiency in Glutamic acid decarboxylase antibody-positive Egyptian patients with Type 2 diabetes. This study will assess the rate of progression to insulin deficiency in Glutamic acid decarboxylase antibody positive patients with Type 2 diabetes.

Aim of the Work

This study aim to assess anti glutamic acid decarboxylase 65 levels in type 2 Egyptian diabetic patients.And if it could be used as a marker for progression to insulin deficiency and treatment with insulin.