Weight Loss Surgery as an Effective Therapy for Diabetes Mellitus

Essay

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Presented by

Dr./ Hasan Taher Abou Elnaga

M.B.B.Ch.

Under Supervision of

Prof. Dr./ Samy Ahmed Abd El Rahman

Professor of General Surgery
Faculty of Medicine- Ain Shams University

Dr./Karim Sabry Abd El Samee

Lecturer of General Surgery
Faculty of Medicine-Ain Shams University

Faculty of Medicine
Ain Shams University
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List of Abbreviations

Abbreviation	The Meaning
A1C	Glycosylated hemoglobin
ADA	American diabetes association
AGB	Adjustable gastric banding
APN	Adiponectin
BMI	Body mass index
BPD	Biliopancreatic diversion
BPD/DS	Biliopancreatic diversion with duodenal switch
\mathbf{BW}	Body weight
cAMP	Cyclic adenosine monophosphate
CCK	Cholecystokinin
CVD	Cardiovascular disease
DCCT	Diabetes control and complications trial
DJB	Duodenal-jejunal bypass
DKA	Diabetic ketoacidosis
DM	Diabetes mellitus
DPN	Diabetic peripheral neuropathy
DPP-IV	Dipeptidylpeptidase iv
DR	Diabetic retinopathy
ER	Endoplasmic reticulum
EWL	Excess weight loss
FBG	Fasting blood glucose
GAD65	Glutamic acid decarboxylase
GCGR	Glucagon receptor
GHSR	Growth hormone secretagogue receptor

GIP	Gastric inhibitory peptide (or glucosedependent insulin-trophic peptide)
GIPR	Gastric inhibitory peptide receptor
GIT	Gastro-intestinal tract
GLP-1	Glucagon-like peptide-1
GLP-2	Glucagon-like peptide-2
GOAT	Ghrelin-o-acyl transferase
Hb _{A1C}	Glycosylated hemoglobin
HDL	High-density lipoprotein
HOMA	Homeostasis model assessment
HOMA-IR	Homeostasis model assessment insulin resistance
IAPP	Islet amyloid poly-peptide
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
IMCL	Intramyocellular lipid
IRS1-pSer ³¹²	Insulin receptor substrate 1-phosphorylated at serine 312
JIB	Jejunoileal bypass
LAGB	Laparoscopic adjustable gastric banding
LRYGB	Laparoscopic roux-en-y gastric bypass
LSG	Laparoscopic sleeve gastrectomy
MGB	Mini-gastric bypass
MODY	Maturity onset diabetes of the young
NGSP	National glycohemoglobin standardization program
NPY	Neuropeptide y neurone
OGTT	Oral glucose tolerance test

🕏 List of Abbreviations 🗷

OXM	Oxyntomodulin
PGF	Postoperative gastric fistula
PP	Pancreatic polypeptide
PYY/PYY ₃₋₃₆	Peptide tyrosine tyrosine _{3–36}
RYGB	Roux-en-y gastric bypass
SADI	Single anastomosis duodenal-ileostomy
SBS	Short bowel syndrome
SG	Sleeve gastrectomy
SG + LB	Sleeve gastrectomy with loop bipartition
SG + TB	Sleeve gastrectomy with transit bipartition
SOS	The swedish obese subjects trial
T1DM	Type1 DM
T2DM	Type2 DM
TODAY	Treatment options for type 2 diabetes in adolescents and youth
uACR	Urine albumin-to-creatinine ratio
UGI	Upper gasto-intestinal
VBG	Vertical banded gastroplasty
VTE	Venous thromboembolism
WHO	World health organization
ZnT8	Zinc transporter 8
LADA	latent autoimmune diabetes in adulthood

Abstract

D.M is a metabolic syndrome caused by insulin deficiency or resistance or both. Which usually complicated with microvascular (neuropathy, nephropathy or retinopathy) and macrovascular (IHD, HTN, strokes or PAD). It is found that, there are improvement in the glycemic condition after the bariatric surgery. It was thought that improvement is related to the weight loss, but the improvement usually precedes the weight loss. That is due to the changes of the GUT hormones like GLP-1 and GIP which increase insulin and decrease glucagon secretion and ghrelin and PYY which affect food intake. The sleeve gastrectomy and RYGB are preferred due to their minimal complications ._Mini-gastric bypass, Laparoscopic sleeve gastrectomy with loop bipartition and SADI-S are new eras. The effect of the operations not related only to the glycemic control but also decrease the micro and macrovascular complications. Usually about 80% of the patient completely cured from D.M, about one third of the patient relapses.

Key words: Bariatric, T1DM, T2DM and GIT hormones.

Introduction

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The main types of diabetes mellitus: Type 1 diabetes (b-cell destruction, usually leading to absolute insulin deficiency). This form of diabetes accounts for only 5–10% of those with diabetes and Type 2 diabetes which is mainly due to insulin resistance with relative insulin deficiency. This form of diabetes accounts for 90–95% of those with diabetes (16).

There is a strong association between obesity and type 2 diabetes. Both are emerging pandemics in the 21st century. They are major public health problems throughout the world and are associated with significant, potentially life-threatening co-morbidities and enormous economic costs. The prevalence of overweight and obesity is increasing rapidly worldwide, especially in developing countries (263).

Bariatric surgery is defined as gastrointestinal surgery to help severely obese patients to lose weight. It offers the only realistic chance of long-term weight reduction, and resolution or improvement of co-morbidity for the majority of these patients (264).