

SIGNIFICANCE OF TRIGLYCERIDES TO GLUCOSE INDEX FOR  
ASSESSING INSULIN RESISTANCE IN TYPE 2 DIABETES.  
DATA FOLLOWING METABOLIC/BARIARIC SURGERY

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Tryglycerides to glucose index:

$$\text{TyG} = \ln ((\text{Tg} * \text{FBG})/2)$$

indirect parameter widely validated with clamp technique

correlation with the HOMA data

Two groups of obese patients with type 2 diabetes (T2D) matched for age, gender, baseline degree of obesity, FBG and T2D duration, undergoing biliopancreatic diversion (BPD) and evaluated at one year after the operation

Remission group (RG): patients with normal FBG at 1 year after BPD at free diet and without any antidiabetic therapy

Unsuccessful group (UG) : patients with FBG still in the diabetic range at 1 year after BPD

	postoperative T2D remission		postoperative T2D	
	prior to BPD	1 year after BPD	prior to BPD	1 year after BPD
<b>subjects (#)</b>	64	64	54	54
<b>age (yrs, range)</b>	47		40	
<b>T2D duration (yrs)</b>	7		6	
<b>BW (kg)</b>	99.7	82.8	98.1	81.1
<b>BMI (kg/m<sup>2</sup>)</b>	35.3	28.7	34.9	28.9
<b>% EWL</b>		48.5		42.2
<b>FBG (mg/dl)</b>	218	93	229	159 ‡
<b>TyG (mg/dL<sup>-1</sup>)</b>	9.75	8.68 §	9.79	9.44 ‡
<b>hypertension (#)</b>	22	6 §	27	8§
<b>dyslipidemia (#)</b>	15	1 §	12	9 ‡

§ p<0.01 vs. preoperative

‡ p<0.01 vs. T2D remission

In RG patients, the FBG and TyG mean values decreased and prevalence of hypertension and dyslipidemia reduced.

In UG patients, only a reduction of hypertension prevalence was observed

At 1 year after BPD, in UG patients the TyG values and the dyslipidemia prevalence were higher than in the RG ones

In a logistic regression model carried out in all patients, T2D presence (as a dependent variable) was independently associated with and with the TyG index ( $z=4.15$ ,  $p<0.01$ ), while resulted fully unrelated to the BMI values and to the operative status (pseudo  $r^2=0.41$ ).

in RG and UG patients, the weight loss, the changes in BMI values and the %OW reduction post BPD were closely similar, thus the total body fat mass loss is supposed to be similar

therefore, in all patients a closely similar reduction of the HOMA index and then of the insulin resistance related to body mass has to be assumed

the simple normalization of insulin resistance is not sufficient for a post bariatric/metabolic surgery T2D resolution

TyG is not a reliable parameter for assessing the insulin resistance changes after the surgically obtained weight loss.

after BPD, the insulin secretion recovery plays a key role in the postoperative T2D remission

The reduction of TyG index could reflect an improvement of extracellular milieu, with an insulin related improvement of glucose utilization and a decrease of intracellular fat depot in liver and in muscle tissue

Therefore, after metabolic bariatric surgery the TyG could mirror the achievement of a global metabolic health, with an adequate glucose utilization, the break of lipotoxicity and the recovery of a normal fat distribution

TyG index can be reliably used to predict a metabolic outcome or to monitor the efficacy of therapeutic procedures for metabolic disorders regardless of weight changes