

## Risk factors of impaired glucose metabolism in transfusion-dependent patients with $\beta$ -thalassemia: a single-center retrospective observational study

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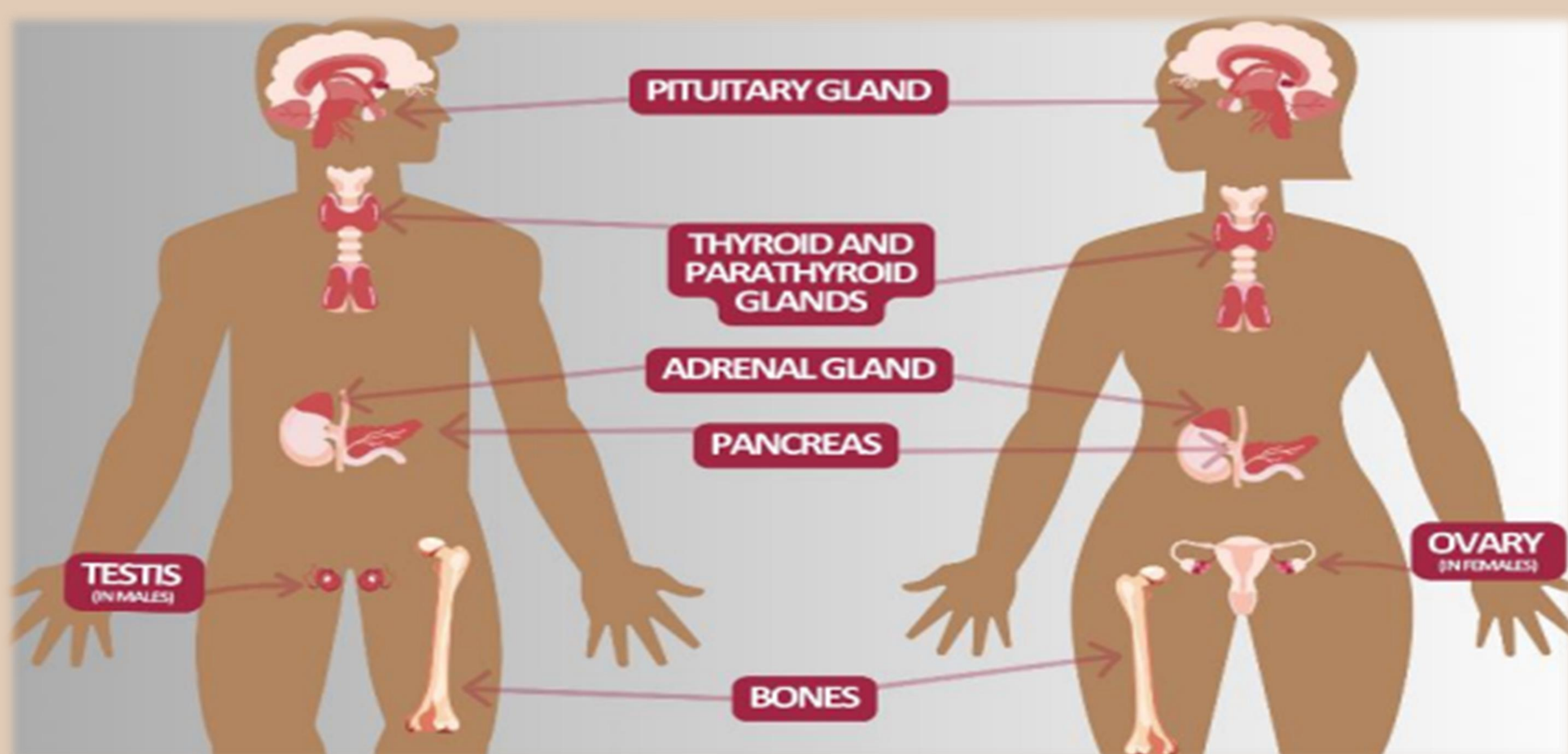
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### Background

- B-thalassemia is the most common genetic hematological disorder, characterized by reduced production or complete absence of  $\beta$ -globin chains. It is characterized as transfusion-dependent (TDT) and non-transfusion-dependent.
- The endocrine disorders associated with beta-thalassemia are mainly linked to: 1. iron overload, 2. chronic anemia, and 3. hypoxia.
- In literature, the reported frequency of glucose metabolism disorders in patients with transfusion-dependent  $\beta$ -thalassemia ranges from 0% to 35% for Diabetes Mellitus (DM) and from 20% to 30% for Impaired Glucose Tolerance (IGT).

### Objectives

- Investigation of the frequency and risk factors for the occurrence of glucose metabolism disorders in patients with transfusion-dependent beta-thalassemia.
- Correlation of pancreatic iron deposition with indices of iron overload.



### Results

- The occurrence of glucose metabolism disorders was significantly associated with age and serum gamma-glutamyl transferase (GGT) levels (p: 0.02).
- No statistically significant difference was observed between the groups for the other examined parameters (p>0.05).
- The administration of beta-blockers was significantly associated with glucose metabolism disorders (p: 0.02).
- Multivariable logistic regression did not reveal a significant effect of the examined variables on glucose metabolism disorder.
- A significant positive linear correlation was observed between pancreatic MRI T2\* and cardiac MRI T2\* (Pearson coefficient: 0.45, p: 0.04).

### Conclusions

- High levels of gamma-glutamyl transferase ( $\gamma$ GT) indicate that oxidative stress plays a critical role in the development of glucose metabolism disorders in patients with TDT.
- Pancreatic MRI T2\* can predict cardiac iron overload in patients with TDT.
- Further research is required to identify the factors contributing to glucose metabolism disorders and to find reliable prognostic biomarkers in patients with TDT.

### Material and Method

Adult Thalassemia Unit  
Hippokration General Hospital, Thessaloniki (2018-2022)

Patients with TDT  
Impaired Glucose Metabolism (n:64)

Absent / Present

Group A	Group B	
46/64 (71.8%)	DM 8/64 (12,5%)	IGT 10/64 (15,6%)
	18/64 (28,1%)	

- Diagnosis based on the criteria of **American Diabetes Association:**

Fasting serum glucose >126mg/dl (DM)

Serum glucose (2h-OGTT) >200mg/dl (DM)

Serum glucose (2h-OGTT) >140mg/dl (IGT)

- Recording of data from medical history regarding laboratory test results, medication use, splenectomy history, HCV infection, age, gender, cardiac, liver, and pancreatic MRI T2\*, annual volume of transfused blood, genotype, chelation therapy, blood group, average body weight, and cardiac ejection fraction.
- Performing multivariable logistic regression.
- Correlation of pancreatic MRI T2\* with: 1. serum ferritin, 2. liver MRI T2\*, and 3. cardiac MRI T2\*.

### Statistical analysis SPSS (27.0.1.0)

Level of statistical significance:0.05

Variables	P-value
Age	0.02
GGT	0.02
B-blockers	0.02

Pancreatic MRI T2*	Pearson coefficient	p-value
Liver MRI T2*	-0.27	0.24
Heart MRI T2*	0.45	0.04
LIC	0.16	0.49
Fasting serum glucose	-0.33	0.15
Serum ferritin	-0.05	0.83

### Multivariate logistic regression

Variables	p-value	OR	95%CI
Age	0.16	1	0.97-1.1
ALT	0.71	0.98	0.91-1.06
AST	0.64	1	0.96-1.05
GGT	0.14	1	0.99-1.07
Heart MRI T2*	0.19	0.9	0.81-1.04
B-blocker	0.18	2.4	0.63-1.7

### References

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