Disturbances of glucose homeostasis in polytransfused beta-thalassemia patients

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INTRODUCTION

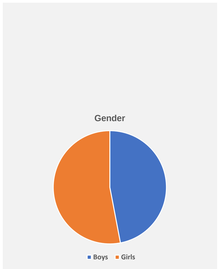
- B-thalassemia is a hereditary chronic hemolytic anemia characterized by a defect in the synthesis of beta-globin chains, particularly common in the Mediterranean region, southern Asia, and the Middle East. (1)
- Transfusion programs and chelating therapy have greatly extended the life expectancy of patients (2). This has led to an increase in the prevalence of endocrine complications, linked to iron overload (3) including abnormalities in glucose homeostasis (4).
  Glycoregulation disturbances range from insulin resistance and glucose intolerance to obvious diabetes mellitus.
- Regular follow up of ferritinemia is the most commonly biological component used to assess the degree of iron overload. The correlation between the ferritinemia rate and glycoregulation abnormalities is not well studied and deserves to be specified.(5-6)

AIM

- **Main:** Describe the frequency of glucose homeostasis abnormalities in patients with polytransfused β-thalassemia
- **Secondary:** study the relationship between abnormal glycoregulation and :
  - Ferritinemia level
  - Average transfusion volume (VTA)
  - Duration of transfusion therapy
  - Splenectomy
  - Compliance with chelating treatment

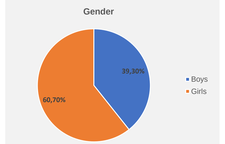
RESULTS

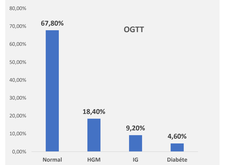
- 16 (18.4%) patients had moderate fasting hyperglycemia (MGH), 8 (9.2%) patients had glucose intolerance (GI), and 4 (4.6%) patients had diabetes (3 patients diagnosed before the start of the study).
- 28 (32.2%) patients presented glycoregulation disorders with 17 (60.7%) girls and 11 (39.3%) boys, there is no statistically significant relationship between the two genders (p = 0.31),
- The patients presented glycoregulation disorders are significantly older (Average age: 13.4 ± 6.58) VS (10.2 ± 5.2), (p = 0.01)
- 10 (12%) patients presented a positive HOMA test, 6 (7.2%) have glycoregulation disorders (4 MGH, and 02 IG) , the relationship was statistically significant between glycoregulation disorders and HOMA (p = 0.02), (OR = 4.3)
- Serum ferritin mean 1653.16 ± 1272 ug / l, 20.7% severe overload,there is no statistically significant relationship between ferritinemia and glycoregulation disorders (p = 0.65).
- Splenectomy and the duration of transfusion therapy significantly increase the risk of glycoregulation disorders (p = 0.03), (OR = 2.6); (0.01), (OR = 3)
- After logistic regression, only age was retained as a prognostic factor for glycoregulation disorder (ORa = 2. P = 0.02).



N=87
SEX Ratio=0,9
Girl/Boy =46/41

Tranche /Age Year	n	%
< 5	10	11,5
5-10.	32	36,8
10-15.	23	26,4
> 15	22	25,3





	glycoregulation disorders		
	Yes	No	P
Age	13,4±6,58	10,2±5,2	0,01

		Glycoregulation disorder		OR	P	Multi varié
		Yes n=28	No n=59			
Age		13,4	10,2		0,01	ORa = 2. P=0,02
Gender	Boys	11(39,3)	30(50,8)		0,31	
	Girls	17(60,7)	29(49,2)			
Ferritinémie (µg/l)	> 2500	5(17,9)	13(22)		0,65	
	< 2500	23(82,1)	46(78)			
HOMA	Positive	6(24)	4(6,8)	4,3	0,02	
	Négative	19(76)	55(93,2)			
Splenectomy	Yes	15(53,6)	18(30,5)	2,6	0,03	
	No	13(46,4)	41(69,5)			
Duration of transfusion	> 10	16(57,1)	18(30,5)	3	0,01	
	< 10	12(42,9)	41(69,5)			
Average transfusion volume (VTA)	>250	9(32,1)	18(30,5)		0,87	
	< 250	19(67,9)	41(69,5)			
Compliance	Yes	25(89,3)	49(83,1)		0,44	
	No	3(10,7)	10(16,9)			

METHOD

- It is a descriptive, analytical and mono-centric cross-sectional study which was carried out in the pediatric department of CHU Mustapha and which involved 87 patients (46 Girls and 41 Boys), followed for several years on a regular basis and treated by a transfusion regimen (more than 10 transfusions) combined with a chelating treatment.
- All patients were assessed by a clinical history, physical examination, fasting blood glucose and glucose tolerance test (OGTT) combined with a test of HOMA-IR (Homeostasis Model Accessment of insulin resistance).

CONCLUSIONS

- Our results suggest that children with β-thalassemia have a high incidence of glycoregulation disorder in the second decade of life or later.
- Detection of the pre-diabetes stage is essential, and can be reversed by intensifying chelation therapy.

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