

19E LEVELS IN β -THALASSAEMIA

THESIS

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TO MY MOTHER

CONTENTS

	page
* INTRODUCTION AND AIM OF WORK.....	1
* REVIEW OF LITERATURE.....	3
- β -thalassaemia major.....	3
- Immunoglobulin E.....	19
- Immunoglobulin E in β -thalassaemia major...	42
* PATIENTS AND METHODS.....	44
* RESULTS.....	52
* DISCUSSION.....	70
* SUMMARY AND CONCLUSION.....	74
* REFERENCES.....	76
* ARABIC SUMMARY	

* * *

LIST OF TABLES

	page
Table [1] : The age and the levels of Hb, IgE and ALT in the control group.....	56
Table [2] : The age, the levels of Hb, IgE and ALT, HBsAg and the number of blood transfusion in non splenectomized thalassaemia group.	57
Table [3] : The age , the levels of Hb , IgE and ALT, HBsAg , the number of blood transfusions and the number of years since splenect- omy in splenectomized thalassaemic group.	58
Table [4] : The age, the levels of Hb, IgE and ALT and HBsAg in non splenectomized thalassaemic group without hypersplenism.....	59
Table [5] : The age, the levels of Hb, IgE and ALT and HBsAg in non splenectomized thalassaemic group with hypersplenism.....	60
Table [6] : IgE levels in the different studied groups.....	61
Table [7] : Association between splenectomy and the number of cases with increased IgE level.	62
Table [8] : Association between the presence of HBsAg and splenectomy.....	63
Table [9] : IgE level in relation to HBsAg in the thalassaemic group.....	64

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Table [10]: IgE level in relation to HBsAg in the splenectomized group.....	65
Table [11]: ALT levels in the different studied groups.	66
Table [12]: IgE level in relation to ALT level.....	67

LIST OF FIGURES

	page
Figure [1] : Pathophysiology of β -thalassaemia.....	9
Figure [2] : Diagramatic representation of IgE.....	23
Figure [3] : RAST technique for measuring IgE.....	35
Figure [4] : PACIA technique for measuring IgE.....	37
Figure [5] : RIST technique for measuring IgE.....	39
Figure [6] : Immunoenzymometric technique for measuring IgE.....	51
Figure [7] : \bar{X} and S.E.M. of IgE levels in the different studied groups.....	68
Figure [8] : \bar{X} and S.E.M. of ALT levels in the different studied groups.....	69

A B B R E V I A T I O N S

ALA	=	Amino levulinic acid.
ALT	=	Alanine aminotransferase.
C-domain	=	Constant domain.
C _L	=	Constant light chain.
Fab	=	Fraction of antigen binding.
Fc	=	Fraction crystalizable.
HB _s Ag	=	Hepatitis B surface antigen.
HTLV _{III}	=	Human T cell lymphotropic virus type III.
MNC	=	Mononuclear cells.
mRNA	=	Messenger ribonucleic acid.
PACIA	=	Particle counting immuno assay.
PRIST	=	Paper radioimmunosorbent assay.
RAST	=	Radioallergosorbent test.
RIA	=	Radio immunoassay.
RIST	=	Radioimmunosorbent assay.
V _L domain	=	Variable domain.
V _L	=	Variable part of light chain.

INTRODUCTION
AND
AIM OF THE WORK

INTRODUCTION AND AIM OF WORK

β -thalassaemia major is a severe disturbance of β -globin synthesis with consequent poor erythropoiesis and reduced erythrocyte survival [Ohne-Frempong and Schwartz, 1980] .

Moreover, the thalassaemic patients are subjected to many serious problems like, increased incidence of infections, repeated blood transfusion, splenectomy and chronic liver disease.

Accordingly β -thalassaemic patients have been reported to suffer from many immunological changes. These changes consisted of reduced values of T-lymphocytes [Khalifa et al., 1988], modification in neutrophil functions and increased IgG, IgA, IgM and IgE levels [Ropars et al., 1979 & Khalifa et al., 1983].

Little is reported about the increase level of IgE which differ in its pathogenesis than that of other immunoglobulins.

The study of IgE in thalassaemia , may offer more information about its increase production in liver disease and its relation to blood transfusion and splenectomy.

The aim of this study is to measure IgE levels in children with β -thalassaemia major to evaluate any immunological changes, to correlate serum IgE level with frequency of transfusion and with the effect of splenectomy.

REVIEW
OF
LITERATURE

β - THALASSAEMIA MAJOR

The thalassaemia syndromes are group of inherited disorders of haemoglobin synthesis in which the production of one or more of the globin chains is either diminished or absent with compensatory over production of other chains [Weatherall and Clegg, 1972].

The most common is the β-thalassaemia in which β-chain production is impaired with production of excess α-chains [Fessas and Loukopoulou, 1976].

The defect in β-chain synthesis is due to reduction in either the amount or the functional capacity of the m-RNA [Benz and Forget, 1971].

The study of globin chain synthesis in the homozygous state revealed two major types of β-thalassaemia, one with some residual β-chains [β⁺ type] and another with no β-chain [β⁰ type] [Weatherall and Clegg, 1981].

β⁺-thalassaemia :

It is the most common type of β-thalassaemia in which the thalassaemic reticulocytes have a reduced activity of β-chain m-RNA [Benz and Forget, 1971] due to a reduction in

the amount of β -chain m-RNA rather than reduced activity of normal amount of β -chain m-RNA [Housman *et al.*, 1973].

The shortage of cytoplasmic β -globin m-RNA in β^+ thalassaemia may result from a defect in the processing of the nuclear m-RNA precursors [Nienhuis *et al.*, 1984].

The defect in processing may result from a single base substitution in the small intervening sequence, this change may have created a new splice site and interfere with post-transcriptional processing of β -globin m-RNA precursors [Dobkin *et al.*, 1983] with formation of an abnormal m-RNA which retain some of the small intervening segment. This abnormal m-RNA will be trapped in the nucleus and not translated. The small amount of precursor m-RNA that is processed correctly will be transported into the cytoplasm where translation takes place [Metherall *et al.*, 1986].

β^0 -thalassaemia :

It constitutes 10% of homozygous β -thalassaemia. Absence of β -chain production may be due to a base substitution which prevents normal processing of precursor β -m RNA molecules [Kazazian *et al.*, 1984].

It may also results from mutation in the coding region of β -globin m-RNA causing premature termination signal [non