

Results

Comparison of laboratory results and immunological parameters between β -thalassaemia major children under different treatment modalities and controls

A significant difference was found on comparison between all thalassaemia patients (group I, II, III) and control group regarding Hb levels ($p=0.015$), ANC ($p=0.05$), serum IgA ($p<0.001$), serum C3 ($p=0.001$), serum C4 ($p=0.002$), CD3+ absolute count ($p=0.05$), CD3+/CD4+ absolute count ($p=0.04$), CD3+/CD8+ absolute count ($p=0.06$), CD19+ absolute count ($p=0.02$) and CD56+ absolute count ($p=0.05$) (Table 1).

Also, differences within the 3 thalassaemia groups regarding IgA, C3, C4 (Table 2) along with percents of CD3+, CD3+/CD4+, CD3+/CD8+, CD19+ and CD56+ as well as their absolute counts were summarized (Figure 1 and Table 2).

Parameters	Group I vs II	Group I vs III	Group II vs III
	p-values		
Serum IgA	0.04*	<0.001**	<0.001**
Serum C3	0.01*	<0.001**	<0.001**
Serum C4	0.03*	0.12	0.58
CD3+ (%)	<0.001**	<0.001**	<0.001**
Absolute CD3+ count	0.1	0.4	0.04*
CD3+/CD4+ (%)	0.01*	0.04*	<0.001**
Absolute CD3+/CD4+ count	0.05*	0.3	0.03*
CD3+/CD8+ (%)	0.02*	0.05*	<0.001**
Absolute CD3+/CD8+ count	0.1	0.4	0.05*
CD19+ (%)	0.02*	0.7	0.02*
Absolute CD19+ count	0.1	0.44	0.05*
CD56+ (%)	0.22	<0.001**	0.04*
Absolute CD56+ count	0.11	0.02*	0.2

Table 2: Comparison between studied patients regarding immunological markers; Group I: thalassaemia children receiving blood transfusion only; Group II: thalassaemia children receiving blood transfusion + iron chelation; Group III: thalassaemia children receiving blood transfusion + iron chelation + splenectomy; vs: versus; Ig A: Immunoglobulin A; C3: Complement C3; C4: Complement C4; Non sig. >0.05, Significant $\leq 0.05^*$, High Significant $\leq 0.001^{**}$.

The comparison between splenectomized patients (group III) and non splenectomized ones (group I plus II) concerning the studied immune parameters was illustrated in Figure 1. Serum IgA levels were statistically significant high in splenectomized patients compared with

non splenectomized groups ($p<0.001$) (Figure 2A). Moreover, splenectomized patients showed significant decrease in serum C3 levels ($p<0.001$) and non-significant difference in serum C4 levels in comparison to non splenectomized groups ($p=0.282$) (Figure 2B).

CD3+, 4+ and 8+ percentages were statistically significant higher in the splenectomized group in comparison to non splenectomized patients ($p=0.05$, 0.05 and 0.037 respectively). On the other hand, splenectomized children showed non-significant difference from non splenectomized ones concerning CD19+ percentage, but highly statistically significant lower levels regarding CD56+ ($p=0.235$, <0.001 respectively) (Figure 2C).

Serum ferritin levels within β -thalassaemia subgroups in correlation to immunological characteristics

The mean \pm SD of serum ferritin levels within thalassaemia groups as well as controls were shown in table 1. There was a significant increase in serum ferritin levels when patients were compared with controls ($p=0.013$). Additionally, serum ferritin levels were elevated in splenectomized patients (group III) compared with non splenectomized ones ($p=0.02$) (Figure 3). Significant moderate positive correlation was found between CD3+ cells and ferritin ($p=0.04$, $r=0.6$). As well, significant fair positive correlation was found between CD3+/CD8+ cells and ferritin ($p=0.04$, $r=0.3$) in group I. There were no other significant correlations between ferritin and the remaining immune parameters (Table 3).

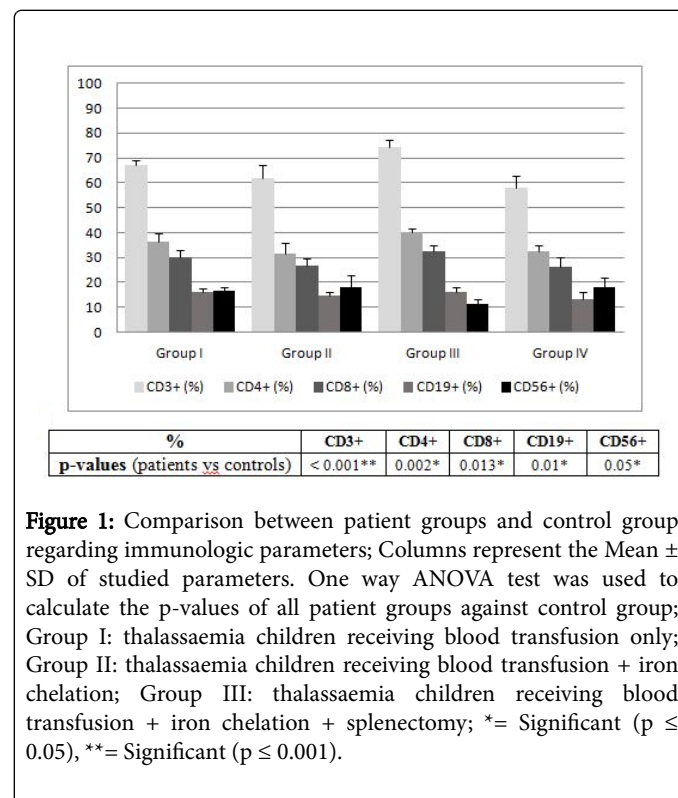


Figure 1: Comparison between patient groups and control group regarding immunologic parameters; Columns represent the Mean \pm SD of studied parameters. One way ANOVA test was used to calculate the p-values of all patient groups against control group; Group I: thalassaemia children receiving blood transfusion only; Group II: thalassaemia children receiving blood transfusion + iron chelation; Group III: thalassaemia children receiving blood transfusion + iron chelation + splenectomy; * = Significant ($p \leq 0.05$), ** = Significant ($p \leq 0.001$).