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# **Evaluation of Selected Salivary Immunological Parameters and Iron Ion Concentration in Relation to Oral Health Condition among Children with Beta Thalassemia Major (Karbala' / Iraq)**

A thesis

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## Abstract

**Background:** Beta Thalassemia Major is an inherited, genetic blood disorder which affect the bone marrow's ability to produce hemoglobin molecules( the component of normal red blood cells that transports oxygen to the body's cells), the red blood cells will have been short lifespan and destroyed at a faster rate. These patients are typically transfusion-dependent, and have significant complications, including iron overload, immune system disorders, and bacterial and/or viral infections which can affect the oral health condition.

**Aims of the study:** The aims of the present study were to assess the severity of dental caries, dental plaque, gingivitis, levels of selected salivary immunological components and iron concentration in saliva, among a group of boys and girls with beta thalassemia major in comparison with the control group.

**Materials and methods:** The study involved 17 boys and 23 girls with beta thalassemia major, aged 8-9 years compared to 17 healthy boys and 23 healthy girls with the same age group. dmfs/ds and DMFS/DS indices (WHO, 1987), plaque index (Silness and Løe,1964), and gingival index (Løe and Silness, 1963) were applied, unstimulated salivary samples were collected for estimation the salivary immunological components(Secretory Immunoglobulin A, lysozyme, peroxidase, and lactoferrin) in which they were analyzed by enzyme-linked immune sorbent assay kits and iron ion concentration in saliva which was analyzed biochemically.

**Results:** Results showed that, caries-experience was higher among beta thalassemia children compared to healthy children. In primary teeth, a higher dmfs/ds mean value was recorded for study group (dmfs/ds=8.93±6.40) compared to control group (dmfs/ds=6.63±5.38), the difference was statistically not significant ( $p>0.05$ ), except for girls the difference was statistically significant ( $p<0.05$ ). For permanent teeth, DMFS/DS mean value was found to be higher in

study group (DMFS/DS=0.63±1.23) compared to control group (DMFS/DS=0.58±0.75), and the difference was statistically not significant ( $p>0.05$ ). plaque index mean value was higher in study group (PI=1.69±0.45) compared to control group (PI=1.52±0.28), and the difference was statistically significant ( $p<0.05$ ). gingival index mean value was higher in study group (GI=1.38±0.20) compared to control group (GI=1.22±0.10), and the difference was statistically highly significant ( $p<0.01$ ). Correlation between dental plaque and gingivitis in study group was positive with statistically highly significant ( $p<0.01$ ). There were some variation in the levels of salivary immunological parameters between study and control groups, the differences were statistically not significant ( $p>0.05$ ), except that for peroxidase, the levels were higher in study group compared to control group and the difference was statistically significant ( $p<0.05$ ). Iron ion concentrations were higher in study group compared to control group, the difference was statistically not significant ( $p>0.05$ ). The correlation between secretory immunoglobulin A levels and dmfs/ds in study group was statistically significant ( $r=-0.32$ ,  $p=0.02$ ). Lysozyme was correlated with DMFS/DS in study group and the correlation was statistically significant ( $r=0.38$ ,  $p=0.01$ ). lactoferrin was correlated with dmfs/ds and DMFS/DS in control group, and the correlation was statistically highly significant and significant respectively ( $r=0.52$ ,  $p=0.00$ ), ( $r=0.32$ ,  $p=0.04$ ). The correlations between iron ion concentrations and dental caries were statistically not significant ( $p>0.05$ ) for both groups. All the correlations between measured salivary parameters and dental plaque and gingivitis were found to be statistically not significant ( $p>0.05$ ) for both groups. The correlations between iron ion and immunological components were statistically not significant ( $p>0.05$ ). The correlation between lysozyme and lactoferrin was statistically significant in both study group and control group respectively ( $r=0.36$ ,  $p=0.02$ ) and ( $r=0.36$ ,  $p=0.01$ ). The correlation between peroxidase and lactoferrin in study group was statistically highly significant

( $r=-0.40$ ,  $p=0.00$ ). In control group, there was statistically highly significant correlation between secretory immunoglobulin A and lactoferrin ( $r=0.41$ ,  $p=0.00$ ).

**Conclusion:** dental caries, dental plaque and gingivitis found to be higher in beta thalassemia major patients than normal children; they need periodic dental examination and effective preventive program.