

Analytical Study for the Determination of
Selenium for β - Thalassemic Patients in
Basra City by Hydrid Generation Atomic
Absorption Spectrometry

At thesis

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Summary

The study include manufacturing of a new electrothermal cell made from quartz with length of (17cm) and diameter (0.8 cm) coated by insulating alumina comberete .The ideal conditions for the determination of Selenium by Hydride generation electrothermal atomic absorption spectrometryhad been found using the homemade all .The results obtained were compared with HG-FAAS .The results showed comparable results in sensetivity and detection limts . are (0.0055) ng Se and (0.0062) ng Se respectively and the detection limit were found to be (0.42)ng/ml Se and (0.48)ng/ml Se respectively .The parameters that affect the atomic absorption signal of Se have been studied such as different concentration of hydrochloric acid and different concentration of Sodium borohydride and the volume of standard solution and flowrate of Nitrogen gas and Mixing time . The results show that the best ideal conditions for Se determination were (1.5)M HCl and (1% w/v) NaBH₄ and (0.2) ml sample volume and (0.5-1.0) L/min and Mixing time (20-30) seconds . The Selenium was determined in blood for patients suffering from β-Thalassemia with ages (1-20) years.The study comprises (76) seventy patients classified according to their age groups (1-5) , (6-10) , (11-15) , (16-20) years . The results obtained show that , the Se levels in blood of patients is higher than Se levels in blood of healthy controls .It has been found that Se levels in blood of patients of age group (1-5) years (288.5 ± 58.57) ng/ml in blood of healthy control while the Se level in blood of patients for other age groups (6-10) , (11-15) and (16-20) years were found to be (272.67 ± 50.1) , (254.94 ± 57.0) and (223.7 ± 60.71)ng/ml respectively , on comparision with Se levels in blood of healthy control of the same ages groups it was found to be (258.5 ± 61.0) , (223.7 ± 60.71) and (197.42± 18.31) ng/ml respectively .On the other hand the results reveals that the Iron content in blood of patients is high than the Iron content in blood of healthy control .The Fe levels in blood patients of age groups (1 – 5) , (6-10) , (11-15) ,(16-20) years was found to be (28.58 ± 6.47) , (31.15 ± 10.91) , (24.95 ± 7.16) and (30.15 ± 11.09) μ mol/L respectively

whereas in blood of healthy control it was found to be (26.72 ± 2.84) , (27.59 ± 3.27) , (26.85 ± 2.35) and (26.31 ± 3.49) μ mol/L respectively .

The Total Iron binding capacity (TIBC) content in blood of patients were higher than the TIBC content in blood of patients which were found to be according to age groups (1-5) , (6-10) , (11-15) ,(16-20) as follows (52.47 ± 6.22) , (54.39 ± 8.42) , (52.99 ± 7.27) and (51.85 ± 6.9) μ mol/L respectively. Whereas the TIBC content in blood of patients in same age groups as follows (46.06 ± 13.36) , (48.35 ± 9.98) , (48.59 ± 14.20) and (47.71 ± 11.08) μ mol/L respectively.

Also the study comprises the determination of other sixteen blood parameter components such as Hemoglobins (Hb) Red blood cell (RBC) , Packed cell volume (PCV) Mean cellular volume (MCV) , Mean cellular Hemoglobin (MCH) , Mean cellular Hemoglobin conc. (MCHC) white blood cell (WBC) , Serum-Iron (S-Iron) . Total Iron binding capacity (TIBC) , blood platelets (Platelet) , Granular (Gran) .Lymphocytes (LYM) , Monocytes (Mono) and Selenium (Se) . The statistical analysis (anova test) shows that there are a very high significance difference (VHSD) for all parameters between healthy and patients for all age groups such as (Hb , RBC , PCV , WBC and Gran blood cells) other parameters reveals high significance difference (HSD) such as Monocytes ,TIBC for (1-5) groups and Lymphocyte , Monocyte for (11-15) groups .

The results for Selenium shows that are very high significance difference (VHSD) for all age groups for patients and controls except the age group (6-10) it will be of (HSD) .