The Determination of UIBC by the Irosorb Method in Cases of Various Liver Diseases

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Unsaturated iron-binding capacity (UIBC) was estimated with Irosorb supplied from the Abott Laboratories and the results were compared with those by Peters' chemical method. The materials were 78 cases of various liver diseases including 20 cases of acute hepatitis, 23 of chronic hepatitis, 14 of liver cirrhosis, 2 of hemochromatosis, 7 of fatty liver and 5 of other hepatic diseases, 7 cases of non-hepatic diseases and 34 normal male persons. The mean value of UIBC of 34 normal males was 267.8±65.9 μg/dl. Serum from a normal male was dividid into 9 aliquots and UIBC was measured by Irosorb method at the same time.

The mean value was 302.2±25.3 μg/dl. On the sera from 13 cases of various liver diseases, UIBC was measured before and after the storage at −°C for a month. No statistically significant difference of the two mean values was observed.

The difference of UIBC values between two measurements in each case was small and the mean value was 25.4±25.0 μg/dl.

UIBC values by the Irosorb method were correlated with those by the chemical method ($\gamma=0.568$) and the regressin line was expressed as $Y=0.95X+67.7$. The mean value of UIBC in 23 cases of chronic hepatitis was a little lower than that of normal controls but it was not statistically significant. The mean value of UIBC in 7 cases of postnecrotic liver cirrhosis was also not significantly lower than that of normal controls, but the deviations were big. In 8 cases of fatty liver in which liver siderosis was normal. The mean value of UIBC in 2 cases of hemochromatosis was 90.5 μg/dl. The correlation between transferrin levels by the immunoplate method and total iron-binding capacity (TIBC) was good in case of the chemical method ($\gamma=0.57$) nad not so good in case of the Irosorb method ($\gamma=0.244$). To clarify the mechanism of higher value of UIBC by the Irosorb method, the absorption of excess iron with resin sponge was repeated in cases of hemochromatosis and liver cirrhosis. After reabsorption, UIBC values by the Irosorb method were lowered and they came close to those by the chemical method. After first absorption of excess iron with resin sponge, paper electrophoresis of hemochromatotic serum was performed and its actigram was drawn. There were peaks in areas of albumin and α-globulin in addition to β-globulin peak. These additional peaks disappeared after repeated absorptions with resin sponges.

As a conclusion, UIBC with Irosorb kit takes higher value by 67.7 μg/dl in comparison to that by the chemical method. Reproducibility was good. There was a significant correlation between the values by the two methods. Because of the simplicity of the procedure, Irosorb method is satisfactory for clinical use.