SUMMARY

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Many theories on the sequence of events leading to the development of chronic liver disease are centered on defect in T cell function (Dudly et al., 1972 and Eddleston and Williams, 1974).

This study was carried out to evaluate the immunoregulatory T cell subsets, immunoglobulins and the complement in children with chronic liver diseases and whether or not they have any role in the pathogenesis or pathology of such disease.

The material of this study included 41 children attending the pediatric gastroentrology unit, pediatric department, Mansura University Hospital during the year 1990-1991.

They were classified histopathologically into 4 groups, chronic active hepatitis,chronic persistent hepatitis, bilharzial hepatic fibrosis, and hepatic cirrhosis.

In addition to careful clinical examination, all children were subjected to the following investigations: liver function tests, serum proteins, hepatitis B virus markers, abdominal sonography, as well as histopathological studies of liver biopsy specimen.

The humoral arm of immunity was studied by quantitative estimation of immunoglobulins IgG, IgM, IgA and complement componants C_3c and C_4 using single radial immunodiffusion plates, while the cellular arm of immunity were studied by enumeration of T lymphocytes subsets using monoclonal antibodies OKT_3 (total T lymphocytes), OKT_4 (helper T lymphocytes) and OKT_8 (suppressor/cytotoxic T lymphocytes).

Considering the liver function tests the total serum bilirubin were elevated in the studied groups with highest level in chronic active hepatitis group and minimum level in bilharzial hepatic fibrosis group. The difference between the studied groups were statistically significant ($P < 0.01$).

The serum transaminasis were elevated in the studied groups with the highest level in chronic active hepatitis group and lowest level in bilharzial hepatic fibrosis group. The difference between the studied groups were significant ($P < 0.01$).

The SGOT/SGPT ratio was only slightly decreased in chronic active hepatitis groups while increased in the other groups in comparison to the control group.

The serum alkaline phosphatase were also abnormally elevated in the studied groups with highest level in hepatic cirrhosis and lowest level in chronic persistent hepatitis group. The difference between the studied groups were statistically significant ($P < 0.01$).

The prothrombin concentration were decreased in the tested gorups with minimum level in hepatic cirrhosis group and highest level in chronic persistent hepatitis group. The difference between the studied groups were statistically significant (P <0.01).

Regarding the serum proteins, the total serum proteins were elevated in the studied groups with the highest level in chronic active hepatitis and lowest level in bilharzial hepatic fibrosis group. The difference between the studied groups were significant (P < o.o5).

The serum globulins were elevated in the studied groups with highest level in chronic active hepatitis and lowest level in chronic persistent hepatitis group. The differnce between the studied groups were significant (P < 0.01).

The serum albumin and A/G ratio were decreased in the studied groups with lowest level in hepatic cirrhosis group and highest level in chronic persistent hepatitis group. The difference between the studied groups were significant (P <0.01).

As regard HBV markers 70% of children with chronic active hepatitis showed evidence of HBV markers. This indicate that the most etiologic agant in chronic active hepatitis children were hepatitis B virus.

Absence of HBs Ag in chronic active hepatitis patients does not indicate absence of the other HBV markers e.g HBe Ag and anti-HBe. Therefore absence of HBs Ag did not exclude HBV infection but rather indicate that other markers should be looked for.

In chronic persistent hepatitis group HBs Ag was positive in 10% of cases, IgG anti-HBc was positive in 40% of cases, anti-HBe was positive in 20% of cases a while anti-HBs was positive in 30% of cases.

50% of children with chronic persistent hepatitis group in our study showed evidence of HBV markers, while 36.4% of children with hepatic cirrhosis showed evidence of HBV markers. On the other hand 60% of chidren with bilharzial hepatic fibrosis having one or more of HBV markers indicating that they are at great risk in catching HBV infection.

Considering the immunoglobulins IgG, IgM and IgA were found to be elevated in our studied groups, the difference between them were statistically significant ($P < 0.01$). The highest level of IgG, IgM, and IgA were detected in chronic active hepatitis groups while the lowest level of IgG and IgM were found in chronic persistent hepatitis group and the lowest level of IgA was foundin hilharzial hepatic fibrosis group.

As regard the complement componants C_3c level was decreased in our studied groups, while C_4 level was decreased in chronic active hepatitis group, bilharzial hepatic fibrosis groups and

cirrhotic group. This may be explained by either higher metabolic degradation or incorporation of C_3c and C_4 in the immune complexes.

The difference in C_3c between the studied groups were not statistically significant ($P > 0.01$), while the difference in C_4 between the studied groups were statistically significant ($P<0.05$).

As regard T cell subsets OKT_3 positive cells and OKT_8 positive cells were increased in chronic active hepatitis children in comparison to the control group, while OKT_4 positive cells and OKT_4/OKT_8 ratio were decreased. The difference between the studied groups were statistically significant ($P < 0.01$).

In chronic persistent hepatitis group the OKT_3 positive cells, OKT_8 positive cells were increased, while OKT_4 positive cells and OKT_4/OKT_8 ratio were decreased in comparison to the control group. The difference in OKT_3, OKT_4, OKT_8 and OKT_4/OKT_8 ratio between the studied groups were significant ($P < 0.01$).

In bilharzial hepatic fibrosis the OKT_3 positive cells, OKT_4 positive cells, and OKT_4/OKT_8 ratio were decreased, while the OKT_8 positive cells was increased in comparison to the control group. The difference in T cell subsets and OKT_4/OKT_8 ratio between the studied groups were significant ($P < 0.01$).

Lastly the OKT_3 positive cells, OKT_8 positive cells were normal in hepatic cirrhosis, while the OKT_4 positive cells and OKT_4/OKT_8 ratio were increased in comparison to the control group. The difference between the tested groups were significant ($P < 0.01$).

The correlation statistics between the different variables done for the clidren with chronic liver diseases revealed that:

IgG was positively correlated with serum globulin, total serum bilirubin, total serum proteins, alkaline phosphatase; while negatively correlated with A/G ratio and prothrombin concentration. All these correlations were statistically significant.

IgA was positively correlated with total serum bilirubin, SGOT, SGPT, while negatively correlated with prothrombin concentration. These correlations were statistically significant.

OKT_4 positive cells was positively correlated with OKT_3 and OKT_4/OKT_8, while negatively correlated with OKT_8 positive cells. These correlation were statistically significant.

OKT_8 positive cells was negatively correlated with OKT_4 positive cells and OKT_4/OKT_8. These correlation were statistically significant.

HBs Ag was positively correlated with HBe Ag; while Anti-HBe was positively correlated with anti-HBs.

The multivarient discriminal analysis has been adapted to differentiate between CAH and CPH. The significant clinical and biochemical variables were utilized to calculate the z cut score between the two groups. Value below zero was indicator of CPH, while a value above zero is an index for CAH. The specificity, sensitivity and overall efficiency were 100%.

The multivarient regression analysis applied to differentiate between the studied groups. The significant variables were utilized to develop a score for each patient. Applying such a score CAH,CPH, bilharzial hepatic fibrosis and hepatic cirrhosis could be predicted on clinical and biochemical ground. Therefore liver biopsy could be substituted by such a score if it is contraindicated.

Using multivarient regression analysis, the predicting variables for development of hepatomegaly, ascites, oedema, splenomegaly and Jaundice in the children with the chronic liver disease were utilized to develop a score for each patient. Applying such a score one can thus predict if any particular case will develop hepatomegaly, ascites, oedema, splenomegaly and Jaundice or not.