



Contents lists available at CurrentSciDirect Publications

International Journal of Current Biological and Medical Science

Journal homepage: www.currentscidirect.com



Short Report

Viral hepatitis and enzyme study

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ARTICLE INFO

Keywords:

Jaundice
Enzyme assay
Correlation
Hepatocellular damage
Cholestasis
Viruses A B C D E

ABSTRACT

The present study was undertaken in sixty patients of viral hepatitis of both sexes ranging 20 to 60 yrs. of age to compare serum levels of 5' Nucleotidase, Alkaline phosphatase, aspartate aminotransferase, and alanine aminotransferase & serum bilirubin. Forty of clinically healthy subjects were taken as control group. These were patient's attendants without any evidence of liver disease so as to equilibrate the socioeconomic status and age. The study group patients were either admitted to Rajindra Hospital, Patiala, or attending the OPD. A detailed clinical examination was carried out in all as per plan mentioned in materials & methods. Diagnosis of these patients was based on clinical findings. Endeavour was to find out a single enzyme marker which is most specific and sensitive parameter out of all above. It was later concluded that value of 5' NT was highly significant as compared to ALP. A positive correlation was observed between AST, ALT & serum bilirubin level. But 5' NT showed no correlation with aminotransferases.

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1. Introduction

Acute viral hepatitis can cause anything from a minor flu-like illness to fatal liver failure. Sometimes there are no symptoms. The severity of symptoms and speed of recovery vary considerably, depending on the particular virus and on the person's response to the infection. Hepatitis A and C often cause very mild symptoms or none at all and may be unnoticed. Hepatitis B and E are more likely to produce severe symptoms. Co-infection with hepatitis B and D may make the symptoms even more severe [1-4].

Symptoms usually begin suddenly. They include a poor appetite, nausea, vomiting, and often a fever and pain in the upper right of the abdomen (where the liver is located). In people who smoke, distaste for cigarettes is a typical symptom. Occasionally, especially with hepatitis B, infected people develop joint pains and itchy red hives on the skin [5] (wheals or urticaria).

Typically, after a few days, the urine becomes dark, and jaundice (a yellowish discoloration of the skin and whites of the eyes) develops. Both of these symptoms occur because bilirubin builds up in the blood. Bilirubin is the main pigment in bile, the greenish

yellow digestive fluid produced by the liver [6-9]. Most symptoms usually disappear at this point, and people feel better even though the jaundice may worsen. The jaundice usually peaks in 1 to 2 weeks, then fades over 2 to 4 weeks. Symptoms of cholestasis (a reduction or stoppage of bile flow)—such as pale stools and overall itchiness—may develop, particularly in people with hepatitis A.

Rarely, particularly with hepatitis B, symptoms become extremely severe (fulminant). Liver failure may occur and may be fatal, especially in adults. Hepatitis commonly results from a virus, particularly one of the five hepatitis viruses—A, B, C, D, or E. Less commonly, hepatitis results from other viral infections, such as infectious mononucleosis, herpes simplex, or cytomegalovirus infection. Various other infections and disorders can result in small areas of inflammation in the liver but rarely cause symptoms or problems [8-13].

Purpose of review: The present review is a concise review of recent developments in enzyme study in the field of viral hepatitis, based on publications between December 2007 and November 2008.

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2. Materials and Methods

In this study sixty clinically diagnosed and forty controls underwent following special investigations. These were apart from routine tests of blood and urine.

- 1) 5'NT was carried out by Campbell's method.
- 2) ALP was done by Kind& king using aminoantipyrine.
- 3) Aminotransferases by Reitman & Frankel method
- 4) Serum bilirubin was estimated by Malloy & Evelyn
- 5) All the investigations were counterchecked by fully automated device so as to achieve nice quantity control.
- 6) Colorimetric methods were purposely used so as to remain familiar to basics of biochemistry.

3.Result

- 1) Blood tests to evaluate liver function are done. They can indicate whether the liver has undergone hepatocellular damage and often helps distinguish hepatitis due to alcohol abuse from that due to a virus. It can be confirmed by GGT essay.
- 2) Blood tests identify which hepatitis virus is causing the infection. These tests can detect parts of the viruses or specific antibodies produced by the body to fight the viruses.
- 3) Occasionally, if the diagnosis is unclear, a biopsy is done: A sample of liver tissue is removed with a needle and examined. Out of all forty two cases showed clinical jaundice. The mean value of serum 5'NT was highly significant as compared to ALP. A positive correlation was observed between aminotransferases and bilirubin as compared to 5'NT which showed less relation with aminotransferases.

4. Discussion

In the present study, forty two cases revealed jaundice as clinical manifestation. Serum 5'NT was raised in all cases. The increase was from slightly above normal to ten fold of control value [11-14]. The mean value of 5'NT was observed 19.76±9.66. This was highly significant ($t=5.48$ and $p>0.01$). It did not have any significant correlation with rest of parameters viz. ALP, AST, ALT and serum bilirubin. The value of ALP depicted a mean of 18±4.80 KA units. This was less significant than 5'NT levels in serum. Serum levels of aminotransferases were also elevated to significant extent. The mean value of serum AST and ALT were 55±22.44 IU/L. and 51.07±25.90. A positive correlation was observed between increasing values of aminotransferases & serum bilirubin. This can be explained on basis of hepatic cell damage (Table 1&2).

Table 1. Analysis of various biochemical parameters in control group

Investigation	Range	Mean± S.D
5'Nucleotidase (IU/L)	2--8	5.00±1.69
Alkaline Phosphatase (KA Units)/100 ml.	3—10	6.42±2.19
Aspartate aminotransferase (IU/L)	4--12	7.55±2.37
Alanine aminotransferase (IU/L)	5—12	9.15±2.42
Serum bilirubin (mg%)	0.4—0.8	0.57±0.166

Table 2. Stastical Analysis of 5'NT,ALP, AST, ALT and Serum bilirubin in study group

Investigation	Range	Mean± S.D
5'Nucleotidase (IU/L)	(10--46)	19.76±9.66
Alkaline Phosphatase (KA Units)/100 ml.	(9—21)	13.69±4.80
Aspartate aminotransferase (IU/L)	(20—85)	53.30±12.44
Alanine aminotransferase (IU/L)	(28—88)	51.07±25.90
Serum bilirubin (mg%)	5--16	8.46±2.51

5. Conclusion

Thus there is no hitch in accepting that serum 5'NT levels have an indispensable edge that gives them a special place in diagnosis of patients of viral hepatitis, if it is correlated with other Laboratory & clinical data. This came out superior to ALP due to its specificity and sensitivity. While the elevated aminotransferases levels signify extent of hepatic cellular damage, 5'NT specifically signifies the biliary tract obstruction or cholestasis. But if as solitary index, it doesn't measure up to expectations. The conclusive assay of 5'NT can be of immense help in diagnosing the patient pre hand as delay will make his survival doubtful.

6. Prevention

Vaccines, given by injection into muscle, are available to prevent hepatitis A, B, and E infections. The hepatitis A vaccine is recommended for all children and for adults likely to be exposed to the virus. Hepatitis B vaccine is recommended for everyone. Hepatitis E vaccine, a new vaccine, will most likely be used in endemic areas. As with most vaccines, protection requires allowing a number of weeks for the vaccine to reach its full effect as the immune system gradually creates antibodies against the particular virus. People who have not been vaccinated and who are exposed to hepatitis A virus can obtain protection with an injection of an antibody preparation called standard immune globulin. It prevents infection or decreases its severity. However, the amount of protection varies, and the protection is only temporary.

If people who have not been vaccinated are exposed to hepatitis B virus, they are given hepatitis B immune globulin and are vaccinated. Hepatitis B immune globulin contains antibodies to hepatitis B, which help the body fight the infection. This preparation prevents symptoms or decreases their severity, although it is unlikely to prevent infection. Some people need a booster dose of the vaccine.

No vaccines against hepatitis C or D virus are available. However, vaccination against hepatitis B virus also reduces the risk of infection with hepatitis D virus.

Other preventive measures against infection with the hepatitis viruses can be taken:

- Washing hands thoroughly before handling food
- No sharing needles to inject drugs

- Not sharing toothbrushes, razors, or other items that could get blood on them
 - Practicing safe sex—for example, using barrier protection such as a condom
 - Limiting the number of sex partners
- Donated blood is unlikely to be contaminated because it is screened. Nonetheless, doctors help reduce the risk of hepatitis by ordering blood transfusions only when essential. Before surgery, people can also sometimes prevent the need for transfusion of blood from an unknown donor by donating their own blood weeks before the operation.

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