

Delta infection among children with chronic viral hepatitis

Kronik viral hepatitli çocuklarda delta enfeksiyonu

Flora Ilyasovna INOYATOVA MD, Shakhida Ubaevna ABDUMADJIDOVA MD

Hepatology Department, Scientific Research Institute of Pediatrics, Ministry of Health, Tashkent, The Republic of Uzbekistan

SUMMARY: We have investigated 91 patients in this study to examine the incidence and clinical features of concurrent HBV and HDV infections in children. Chronic active hepatitis was diagnosed in 72 children and chronic persistent hepatitis in 19.

Incidence of anti-delta was strongly correlated with the form of chronic viral hepatitis. In chronic active hepatitis group, anti-delta antibodies were found in 80.6% of patients; this ratio was found as 47.4% in chronic persistent hepatitis group ($p<0.01$). Further, the presence of anti-delta was strongly dependent on activity of the process in cases of chronic hepatitis. In the group of delta-positive chronic active hepatitis, the ratio of males was greater than that of female cases ($p<0.05$). In anti-delta positive children, the number of blood transfusions were greater than that of children without anti-delta. Clinical exacerbations were more frequently recorded in children with anti-delta, which characterized mainly with jaundice.

In conclusion, our data obtained confirm that association of delta infection with chronic hepatitis B contribute development of active process leading to the formation of liver cirrhosis. The characteristic history of disease and clinicolaboratory findings may be used as an additional criteria for diagnosis of associated HBV and HDV infection in children.

Key words: Chronic viral hepatitis, delta infection

ÖZET: Çocuklarda HDV ile komplike HBV enfeksiyonlarının klinik özelliklerini incelemek amacıyla 91 çocuk çalışmaya alındı. Bu çocuklardan 72'sinde kronik aktif hepatit ve 19'unda persistan hepatit mevcuttu.

Anti-delta insidansı ile kronik viral hepatitin türü arasında anlamlı bir ilişki tespit edildi. Kronik aktif hepatit grubundaki hastaların % 80.6'sında anti-delta antikorları pozitif iken, bu oran persistan hepatit olgularında % 47.4 olarak bulundu ($p<0.01$). Ayrıca, anti-delta mevcudiyeti ile hastalığın aktif olup olmaması arasında anlamlı bir korelasyon mevcuttu. Delta-pozitif kronik aktif hepatit grubunda yer alan erkek olguların oranı kızlardan anlamlı olarak daha yüksekti ($p<0.05$). Anti-delta pozitif çocuklarda negatif çocuklara göre daha fazla sayıda kan transfüzyonları yapılmıştı. Klinik alevlenmeler, başlıca sarılık olmak üzere, anti-delta pozitif çocuklarda daha sık olarak gözlemlendi.

Sonuç olarak, elde ettiğimiz veriler kronik hepatit B ile delta enfeksiyonunun bir arada bulunmasının karaciğer sirozuna yol açan aktif sürecin gelişmesine katkıda bulunduğunu doğrulamaktadır. Çocuklarda HBV ve HDV kombine enfeksiyonlarının tanısında hastalığın karakteristik öyküsü ve klinikolaboratuar bulguları ilave kriterler olarak kullanılabilir.

Anahtar sözcükler: Kronik viral hepatit, delta enfeksiyonu

Association of viral hepatitis and delta infection is one of the most important problems in the health service because of its high incidence, severe clinical course, possibility of lethal outcome and tendency to chronicity (1-8).

Although the exact mechanism promoting the chronicity of illness in delta virus infections remains to be unclear, many investigators consider delta virus as one of the significant etiologic factors in chronicity of the process in viral hepatitis (3, 9-13). Further, it is known that the association of delta virus with hepatitis B surface antigen carrier state or with chronic hepatitis B often leads to the development of chronic active hepatitis delta

(14-18). In fact, chronic hepatitis delta is a chronic viral process of mixed etiology, involved mainly delta virus (19-21).

We have investigated 91 patients in this study to examine the clinical features of concurrent HBV and HDV infections in children.

MATERIALS AND METHODS

Ninety-one children with chronic hepatitis B infection that applied to Hepatology Department of Scientific Research Institute of Pediatrics in Tashkent were included to study.

Diagnosis of chronic hepatitis was established on the basis of clinicolaboratory findings. Anti-delta antibodies were revealed by radioimmunoassay. Of these 91 patients, chronic active hepatitis was

diagnosed in 72 children and chronic persistent hepatitis in 19.

In statistical analysis, student-t and chi-square test were used. Results were shown as mean \pm standard deviation (SD). $p(a)=0.05$ was considered as significance level.

RESULTS

Incidence of anti-delta was strongly correlated with the form of chronic viral hepatitis. In chronic active hepatitis group, anti-delta antibodies were found in ratio of 19.4% ($n=14$); this ratio was found as 10.5% ($n=2$) in chronic persistent hepatitis group ($p<0.05$). Thus, in chronic active hepatitis, incidence of anti-delta antibodies was determined 1.8 times more often than in chronic persistent hepatitis.

Further, the presence of anti-delta was strongly dependent on activity of the process in cases of chronic active hepatitis; anti-delta was positive in all active cases. In chronic persistent hepatitis, anti-delta was also determined during active process whereas in cases of passive process it was not found.

Most of the patients with chronic delta infection had the history of viral hepatitis in icteric form.

In the group of delta-positive chronic active hepatitis, the ratio of males was greater than that of female cases (68.4% vs. 30.6% respectively; $p<0.05$).

In 29 (40.3%) children with delta-positive chronic active hepatitis and 6 (31.6%) children with delta-positive chronic persistent hepatitis, there was characteristic two-phase disease that may indicate the coinfection. In cases of delta-negative forms of disease, acute viral hepatitis had classic one-phase form.

There were stories of teeth extraction and intravenous manipulation with equal frequency in both children with and without anti-delta antibodies. In anti-delta positive children, the number of blood transfusions were greater than that of children without anti-delta.

Clinical exacerbations were more frequently recorded in children with anti-delta, which characterized mainly with jaundice.

DISCUSSION

On the basis of serologic studies of HBV markers associated with delta virus, the following varia-

tions of the course of delta infection are observed in children with chronic liver diseases: delta superinfection with recent association of delta virus and delta superinfection with prolonged persistence of delta virus (18, 22-24). The first form is generally presented by antibodies to different antigens of HBV and characterized by presence or absence of anti-HBs and lack of HBcAg with presence or absence of anti-HBc (22). In the second form, studies of serologic markers are less helpful. In this variant, HBsAg is inconstantly identified, and the determination of anti-HBe is the main evidence of hepatitis B infection (23, 24). Clinical exacerbations in patients with chronic active hepatitis with delta infection, as a rule, are characterized with marked extrahepatic signs and considerable enlargement of liver and spleen (25). On the other hand, these symptoms are not always observed during chronic active hepatitis without anti-delta and exacerbations are often revealed on the basis of biochemical abnormalities.

Increased levels of liver enzymes, marked extrahepatic signs and jaundice are found as 1.4-1.6 times more often in cases of chronic active hepatitis with delta infection comparing to chronic persistent hepatitis with delta (26). Although increasing of liver enzyme levels and jaundice are less significant in chronic persistent hepatitis, these findings are also more characteristic for delta-positive chronic persistent hepatitis. The enlargement of liver more than 3 cm below the costal margin is observed more often (about 2 times) among the patients with anti-delta positive chronic persistent hepatitis comparing to anti-delta negative ones (25).

Investigations of immune status in concurrent HBV and HDV infection showed a sharp inhibition of cellular immunity indices and increases in number of antigen-binding lymphocytes to delta antigen by suggesting the higher sensitization of organism to delta antigen (27).

Our results demonstrated a considerable prevalence of delta infection among children with chronic viral hepatitis. There was strong correlation between the presence of anti-delta and sex.

Also, results of our study show that concomitant presence of delta infection aggravates the course of disease, resulted in the progress of the process. Delta infection has been found more often in chronic active hepatitis than in chronic persistent hepatitis.

Clinical exacerbations were more frequently recorded in children with anti-delta, which characterized mainly with jaundice. This confirms once more that superinfection induced by delta virus, is one of the causes of process exacerbation in chronic carriers of HBV.

In conclusion, our data obtained confirm that association of delta infection with chronic hepatitis B contribute development of active process leading to the formation of liver cirrhosis. The character-

istic history of disease and clinicolaboratory findings (frequent exacerbations of the process with marked hemorrhagic and cholestatic syndromes, more severely increased levels of liver enzymes, high sensitization to delta antigen, sharp inhibition of immune status indices and profile of specific markers) may be used as an additional criteria for diagnosis of associated HBV and HDV infection in children.

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