

Hepatitis A and B Prevalence in Children with Mental Retardation

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ABSTRACT

Objective: Dependent children with motor and mental dysfunctions are at a risk of communicable diseases, such as hepatitis A virus (HAV) and hepatitis B virus (HBV). Data regarding HAV and HBV infections and need for homecare in these children remain limited. Previous studies have specifically examined spastic children. Here, we investigated the prevalence of anti HAV IgG, HBs Ag, anti-HBc total, and anti-HBs in retarded children requiring homecare.

Methods: This study included 95 disabled children admitted to Pediatric Gastroenterology between June 2015 and December 2016 for nutritional regulation. HBsAg, anti-HBs, anti-HBc, and anti-HAV levels were evaluated by chemiluminescent assay ELISA (COBAS TaqMan 48, Roche Diagnostics, Pleasanton, CA, USA).

Results: Among 95, 47% (45 cases) were females and 53% (50 cases) were males. Mean age was 9 ± 1.7 (4-17) years. In total, 63% cases were anti-HAV IgG positive and 37% were negative. Moreover, 13% of the anti-HAV-positive cases were vaccinated and the remaining 87% were considered non-vaccinated. In total, 74% of the cases were anti-HBs positive, while 26% were negative. Furthermore, 81% of the anti-HBs-positive cases were vaccinated and the remaining 18% were considered as born before the vaccination program. The seroprevalence of hepatitis A was as follows: 4-7 years, 23%; 8-12 years, 32%; and 13-17 years, 45%. The seroprevalence of hepatitis B was as follows: 4-7 years, 21%; 8-12 years, 46%; and 13-17 years, 33%.

Conclusions: Despite previous research on the seroprevalence of hepatitis A and B and availability of healthcare services, our results in children with mental retardation were not different from those in healthy children. All cases received homecare instead of care at nursing homes. Healthy children's vaccination program was also applied to children with mental retardation.

Keywords: Hepatitis A, hepatitis B prevalence, mental retardation, children

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INTRODUCTION

Acute viral hepatitis caused by the hepatitis A virus (HAV) is a self-limiting infection that can be seen in all parts of the world. Since HAV is excreted in the feces of infected people, it spreads person to person by the fecal-oral route and in-house transmission (1-3). HAV remains a major public health problem in developing countries (4, 5). Its seroprevalence in our country is similar to the one found in developing countries; it has been reported to be lower than 40% in healthy children aged between 0 and 10 years and approximately 90% in children over 15 years of age (6, 7).

The hepatitis B virus (HBV) infection is an important health problem, being a leading cause of chronic viral infections. It can be transmitted by infected blood or body fluids (parenterally), by sexual contact, from an infected mother to the newborn (perinatal-vertically), and by non-sexual close contact with infected people (horizontally). It has been reported that the non-parenteral route of the HBV transmission is frequent, especially under the age of 6, and a low socio-economic level and close household contact have been suggested to facilitate transmission (8).

In our country, in the pre-vaccination period, the HBsAg positivity in the normal population was determined as 4%-13.09%, although it varies in different regions; with the onset of vaccination in 1998, the frequency of the HBV infection in various studies has been reported to decrease from 0% to 6.5% (9).

Children in need of care with varying degrees of motor and mental retardation (MMR) are at risk of communicable diseases such as the HAV as HBV infection. There are few studies in the literature about the prevalence of the HAV and HBV infection in patients with MMR (10-15). Although the prevalence of the HAV infection in children with MMR was found to be high in one study, in another, the prevalence was found to be similar to the prevalence in healthy children (10, 11). The rate of the HBsAg positivity in children with MMR was found to be higher than the rate in healthy children (12-15). Although there are many studies on HBsAg carriers and HAV seroprevalence in our country, to the best of our knowledge, there are not enough studies on MMR cases. The only study covering this issue was done in a private hospital for spastic children, and it found that

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the anti-HAV positivity was lower than in healthy children and the anti-HBs positivity similar to that of healthy children (16). To the best of our knowledge, there have been no studies examining MRR cases receiving only home care. In this study, the prevalence of anti-HAV IgG, HBs Ag, anti-HBc total, and anti-HBs was investigated in children with MMR who were cared for by their family at home.

METHODS

The study included 95 children with MMR who were admitted to the Pediatric Gastroenterology outpatient clinic for nutrition programming between June 2015 and December 2016. These were the patients from the Pediatric Neurology outpatient clinic who were routinely followed-up for the motor and mental function loss and were in need of care. All cases were bedridden and cared for by their families. The hepatitis A and B vaccination status of the children, a blood transfusion history, HBV carrier status, and hepatitis A infection in the family history were investigated from the patient records, retrospectively. Parents were informed about the study, and their verbal consent was obtained. 3 mL

venous blood samples were collected, and HBsAg, anti-HBs, total anti-HBc, and anti-HAV IgG levels were determined by the chemiluminescent enzyme-linked immunosorbent assay (COBAS TaqMan 48, Roche Diagnostics, Pleasanton, CA, USA).

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences version 11 (SPSS Inc.; Chicago, IL, USA). Data were expressed as the minimum, maximum, and mean±standard deviation. In the study, the sample size was determined for hepatitis A with the 95% confidence interval and 5% error rate. When the seroprevalence of hepatitis A was calculated as 52.6%, the number of cases required was 93.

RESULTS

Of the 95 patients included in the study, 47% (45 cases) were female, and 53% (50 patients) were male. The mean age was 9 ± 1.7 years (4-17 years). The anti-HAV was positive in 60 patients. Only 8 (13%) of the cases received the hepatitis A vaccine, and the remaining 52 (87%) were unvaccinated. Hepatitis A indicators are shown in Table 1. At the same time, the anti-HBs positivity rate was 74%. Hepatitis B indicators are shown in Table 2. The hepatitis A seroprevalence was found to be 23% in the age group 4-7 years, 32% in the age group 8-12 years, and 45% in the age group 13-17 years. The hepatitis B seroprevalence was 21% in the age group 4-7 years, 46% in the age group 8-12 years, and 33% in the age group 13-17 years (Table 3).

DISCUSSION

Every year, 1.5 million of the HAV infection new cases are reported worldwide (2). The HAV infection shows three different patterns of endemicity: high, medium, and low. In our country, which is located in the middle endemic region, the anti-HAV seroprevalence in healthy children varies according to regions, and it ranges between 8% and 88% according to the age distribution (17). The incidence of hepatitis A infection has been reported to decrease in general, due to the improvement of hygiene conditions, the use of hepatitis A vaccine in 1995, and inclusion of the hepatitis A vaccine into the National Vaccination Program in 2014 (9, 18, 19).

There are few studies in the literature about the prevalence of hepatitis A in patients with MMR in need of nursing-home care

Table 1. Distribution of hepatitis A indicators

	Vaccinated	Unvaccinated	Total
Anti-HAV (+)	8 (13%)	52 (87%)	60 (63%)
Anti-HAV (-)	0	35	35 (37%)
Total	8 (8.4%)	87 (91.6%)	95 (100%)

Table 2. Distribution of hepatitis B indicators

	Vaccinated	Unvaccinated	Total
Anti-HBs (+)	57 (81.4%)	13 (18.6%)	70 (74%)
HBs Ag (+)	0	0	0
HBs Ag (-), Anti HBc IgG (-)	0	0	0
HBs Ag (-), AntiHBc IgG (-), Anti-HBs (-)	18 (72%)	7 (28%)	25 (26%)
Total	75 (78%)	20 (22%)	95 (100%)

Table 3. Distribution of hepatitis A and B seroprevalence of the cases by age

	4-7 years	n	8-12 years	n	13-17 years	n	Total
Anti-HBs (-) Anti HAV(-)	5	33%	7	47%	3	20%	15
Anti-HBs (+) Anti HAV(+)	12	24%	18	36%	20	40%	50
Anti-HBs (-) Anti HAV(+)	2	20%	1	10%	7	70%	10
Anti-HBs (+) Anti HAV(-)	3	15%	14	70%	3	15%	20
Total	22	23%	40	42%	33	35%	95

or care of their families. In MMR children who were cared for in nursing homes and at their own home, Gil et al. (10) found the frequency to be 55%, which is very high, compared to the normal population. Martínez-Campillo et al. (11) found that the prevalence of hepatitis A was not different from the normal population in patients with MMR who were cared for by carers outside their homes. We could not find a study including children with MMR who were looked after only at home, similar to our study. In our country, Tarım et al. (16) performed a seroprevalence study in MMR patients with intermittent hospitalization in a hospital serving spastic children and found the anti-HAV positivity at 12% in the age group 2-5 years, 18% in the age group 6-12 years, 37% in the age group 13-18 years. The ones who received the hepatitis A vaccine were not included into that study. In our study, out of 95 cases, 8 were vaccinated for hepatitis A. The anti-HAV positivity was found to be 63%. Although the anti-HAV seroprevalence in our cases by age is similar to those in healthy children in our country, it was higher, in all age groups, than the one found by Tarım et al.'s (16). Unlike the study by Tarım et al. (16), in our study, some of our patients were vaccinated with the hepatitis A vaccine. In addition, our study groups were from different regions, and it is not known whether their socio-economic status was similar to our cases.

The HBV infection, one of the contagious infections, is most commonly transmitted by infected blood or body fluids via the horizontal route (8). In a few studies involving mentally challenged patients hospitalized in hospitals or nursing homes before vaccination, the HBsAg positivity rate was reported as 3.2%-22%, and it has been reported to increase with the length of hospital stay and with the decrease of level of knowledge of the caregivers on the subject (12-15). In our country, Tarım et al. (16) found the anti-HBs positivity in 11.6% of children born when the vaccine was not included in the national vaccination calendar and 79.5% in children who were routinely immunized. In our study, the anti-HBs positivity was found in 81.4% of the vaccinated group and 18.6% of the unvaccinated group. Although the rate of the anti-HBs positivity before vaccination in our study was higher than that determined by Tarım et al. (16), it was consistent with the literature and data of healthy children in our country. Nevertheless, our results of the anti-HBs positivity following the vaccination program were similar.

CONCLUSION

We found that the seroprevalence rates of hepatitis A and B in our study were not different from those of healthy children, in contrast to some studies in nursing homes. Although the reason of the difference is thought to be the fact that all of our cases are looked at in family environment, not in nursing homes, their contact with the external environment is less frequent, and their families took care of them, as well as their healthy children, and they adhered to vaccination programs; it is not possible to make a reliable comparison since the studies were conducted in different years and regions with the different socio-economic statuses and vaccination rates.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Verbal informed consent was obtained from patients' parents who participated in this study.

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