

Seroprevalence of Hepatitis A infection in Bulgaria

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Summary:

Background: VHA is distributed worldwide, but with different frequency. The different countries' endemicity for the disease is determined by the incidence rate of the morbidity as well as by the seroprevalence of anti-HAVt among the different age groups of the population. The lack of current data in Bulgaria about the latter index has led us to make this survey. The objective is to determine the seroprevalence of anti-HAVt among 180 people, who have no history data for suffering from VHA in Plovdiv region.

Methods: 180 people have been studied for anti-HAVt under ELISA with kits and Dia Sorin apparatuses. The examined persons have been divided into two groups: 1st. Those, living under bad hygienic conditions (mainly of the Roma origin), and 2nd. Those, living under good hygienic conditions.

Results: 93 people from the first group have been examined, where 84 (90,32%) are positive for anti-HAVt. The persons, who have been examined in the second group, are 87, where 39 (44,83%) are positive. The average seroprevalence for all people (180) who have been included in the study is 68,33%.

Conclusions. The determined average seroprevalence of anti-HAVt is typical for the countries with intermediate endemicity of VHA. The epidemiology of the disease is different among people living under different sanitary-hygienic conditions. Diverse measures of prevention should be applied for the two groups of population, in accordance with the established epidemiology of the disease.

Background

Viral hepatitis A (VHA) is distributed worldwide. Depending on the anti-HAVt seroprevalence and according to CDC¹ the world is separated in four zones with different endemicity: 1. High; 2. Transitional; 3. Intermediate; 4. Low or very low. Together with the growth of the social status and the better sanitary hygiene conditions of living in many countries the incidence rate of VHA is getting lower.^{2,1,3,4} The endemicity of the different countries for the disease is determined by the incidence rate of morbidity, as well as by the seroprevalence of anti-HAVt.

According to Nothdurft et al.⁵ the endemicity is based on age-specific seroprevalence. The national incidence of HAV disease may not be relevant because it is possible to have hyperendemic areas without a high incidence of clinical HAV. The age-specific seroprevalence typical of an intermediate-endemicity area for HAV is estimated at >40% in those younger than 25 years. VHA is a serious problem for the travellers in all the world.^{6,7,8} It is necessary that permanent surveillance of seroprevalence of hepatitis A infection is introduced for the entire Europe and that a Consensus for preventive measures is developed.^{5,9,10,11}

The objective of the study is to examine the seroprevalence of anti-HAVt in the Plovdiv region, for which there is no existing data from before.

Method

The sero-epidemiological research is conducted between 05.01.2008 and 20.03.2008. It covers 180 people, aged between 16 and 43. The examined people are included in two groups: 1-st group – 93, living under bad sanitary-hygienic conditions, mainly of Roma origin; 2-nd group – 87 living under good sanitary-hygienic conditions. All of them come from *Plovdiv* (the second biggest city in Bulgaria) and *from the Plovdiv region*. The entire region has around 400 000 residents of 7 million residents in the entire country.

The studied people have no history data for illness from VHA. None of them have been immunized against the disease, nor he has been in contact with a diseased from hepatitis A during the preceding 50 days. We collected serum from all of them after obtaining their informed consent. The samples were tested for anti-HAVt with kits and apparatus of Dia Sorin. The tests with antibodies against hepatitis A virus above 20 mIU/ml are accepted as positive. Following methods were used: epidemiological research and analyze; and ELISA to estimate anti- HAVt in serum samples.

Data are statistically processed, using Fisher's exact test 2x2 tables.

Results

The studied people from the 1st group – living under bad sanitary-hygienic conditions (Table 1) were divided in 2 age subgroups: between 16 and 25 and between 26 and 43. Those aged 25 or less are with seroprevalence 88,25%, and among those aged 26-43 – the seroprevalence is 92,86%. The average seroprevalence among all 93 examined from this group is 90,32%.

Table 1
1st group – people living under bad sanitary-hygienic conditions

Age	No examined	Anti-HAV +	Anti-HAV -
16-25	51	45 (88.23%)	6 (11.77%)
26-43	42	39 (92.86%)	3 (7.16%)
Total	93	84 (90.32%)	9 (9.68%)

From the 2nd group – living under good sanitary-hygienic conditions (Table 2), 87 persons were examined altogether. They were also divided in 2 age subgroups – between 16 and 25 and between 26 and 43. The seroprevalence in the first subgroup

(aged 16- 25) is 50%, and among these aged 26-43 years was lower – 41,18%. The average seroprevalence for the whole group is 44,83%.

Table 2
2nd group – people living under good sanitary-hygienic conditions

Age	No examined	Anti-HAV +	Anti-HAV -
16-25	36	18 (50%)	18 (50%)
26-43	51	21 (41.18%)	30 (58.82%)
Total	87	39 (44.83%)	48 (55.17%)

The average seroprevalence for all 180 persons included in the study is 68,33%. (Table 3). The summed results for the both groups show seroprevalence of 72,41% for the people aged 16-25 and 64,52% among the people aged 26-43. These results are different from the ones received from the other authors^{1,3,4}, who determine increase of the seroprevalence with increase of the age. that we comment with the conclusions.

Table3
Average seroprevalence for all examined persons

Age	No examined	Anti-HAV +	Anti-HAV -
16-25	87	63 (72.41%)	6 (29.59%)
26-43	93	60 (64.52%)	3 (35.48%)
Total	180	123 (68.33%)	9 (32.67%)

Conclusions

We should acknowledge that the study is provided in one of the regions in Bulgaria and therefore conclusions for the entire country can not be drawn. But it includes enough persons, so reliable conclusions for the region can be made.

The established very high seroprevalence in the 1st group (90,32%) shows a high endemicity of the disease in that group of population, which is due to the low social status and the bad sanitary-hygienic conditions of life. An inessential difference ($\hat{e}=0,505$) in the seroprevalence between the two age subgroups is determined – those aged 16-25 and those aged 26-43 (respectively 88,23% and 92,86%). This indicates that the infection with hepatitis A happens in the child age (before the 16th year).

The seroprevalence in the 2nd group (44,83%) is characteristic for the intermediate-endemicity, and it even reaches the border with the low-endemicity <40%.⁵ In this group a trend for a lower seroprevalence is determined in the bigger age subgroup (16- 25:50%; 26-43: 41,18%). Despite of the unessential difference ($\hat{e}=0,512$) it seems paradoxical at first. But this could be due to a period of time (1975-1990) during which the asymptomatic forms of VHA were with very low incidence in that population. With the increase of the incidence of the asymptomatic forms among the children during the next years (1990-2000) the seroprevalence of anti-HAVt has risen as well among the people who are currently aged between 16- 25. This data is in full correspondence with the sickness from VHA in the region, which we have determined

through another survey we conducted, but we have not yet published. People from the 1st group are the ones who are usually diseased (over 70%), and most of them (above 80%) are children not older than 10 years. In the 2nd group the clinical forms are mainly among people above 25 who have a higher receptivity due to the lower seroprevalence of anti-HAVt for them.

The conclusion is as follows:

1. The average seroprevalence for all examined people (68,33%) reveals intermediate endemicity for the region of Plovdiv.
2. Essential difference ($p < 0,0001$) is established in the seroprevalence between the groups. This indicates that the epidemiology of the disease is different for the two groups.
3. The preventive measures against VHA including active or passive immunoprophylaxis have to be consistent with the epidemiology of the disease for the respective group of the population, which has not been done in the routine practice yet.
4. Sero-epidemiological surveillance for VHA is necessary to be conducted. With it the endemicity of a certain country or region for the disease, and also the risk for the persons in the different age groups to become diseased will be determined more precisely.

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