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PREVALENCE OF HBsAg AMONG RESIDENTS OF SOCIAL ASSISTANCE HOMES IN PODLASKIE PROVINCE (NORTHEASTERN POLAND)

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Residents of stationary long-term care institutions may be at increased risk for hepatitis B virus infection. The study was undertaken to determine the prevalence of HBsAg among residents of social assistance homes, to identify risk factors for HBV transmission and to assess the need for prevaccination screening for HBV.

Key words: hepatitis B, social assistance homes, vaccinations

Słowa kluczowe: wirusowe zapalenie wątroby typu B, domy opieki społecznej, szczepienia ochronne

INTRODUCTION

Residents of stationary long-term care institutions are considered a risk group for hepatitis B virus infection. Previous studies in Europe have shown that prevalence of HBsAg among institutionalized, mentally handicapped persons is higher than in general population ranging from 6%-9% in Italy (1) and Spain (2) to 16,7% in Netherlands (3). Several factors may contribute to easier spread of HBV within the population of institutionalized patients: higher number of carriers, closer contacts with other patients, poor hygienic habits, patients' dependence on support from medical staff, aggressiveness of some individuals favouring exposure to blood or body fluids (1). It is known that person-to-person spread of HBV can occur in settings involving non-sexual interpersonal contact. HBV occurs in very high concentrations in blood or body fluids and remains infectious for long periods of time under unfavourable conditions. The virus can be transmitted through contaminated items of personal use (razors, towels, toothbrushes).

The endemicity of HBV infection varies greatly worldwide. Poland is considered to be one of the countries with low pattern of HBV infection (4). Earlier estimates suggested that about 1-2% of Polish general population have HBsAg and about 20% were anti-HBc positive (5).

In Poland acute hepatitis B infections have been registered since 1979 and at the beginning of nineties the incidence was among the highest in Europe. The number of acute

hepatitis B cases decreased markedly in the last 25 years and the incidence fell from 43,5/100 000 (15345 registered cases) in 1979 to 4,1/100000 (1570 registered cases) in 2004 (6,7). The significant decrease in hepatitis B morbidity were in large part the result of successful immunization policy.

The current programme of HBV control in Poland includes obligatory and free of charge vaccinations of all newborns, adolescents at 14 years of age not previously vaccinated against HBV, medical students and medical staff, household contacts of HBV infected persons, haemodialized patients and persons with chronic liver disease. Vaccination has also been recommended on the own-cost basis to other groups at risk. Residents of long-term care institutions are not currently covered by free of charge HBV immunizations programme in Poland however they are entitled to them if other residents are found HBsAg positive. The improvements in control of HBV infection in Poland were the result of immunizations but also of adopting universal precautions, wider use of disposable medical equipment, better understanding of the ways the virus is transmitted.

The primary purposes for this study were to assess the prevalence of HBsAg among residents of social assistance homes, to identify risk factors for HBV transmission, to assess the need for prevaccination screening for HBV.

MATERIALS AND METHODS

Podlaskie Voievodship is an administrative region in North-Eastern Poland with population of 1 200 000 inhabitants. In the whole province there are 29 social assistance homes with 2 493 residents altogether. Social assistance homes provide stationary care for the elderly subjects, adults with somatic conditions, the developmentally disabled, and mentally ill. The disabled persons are in various stages of dependency on the others. The social assistance homes are generally classified according to the disease and age of the disabled persons into the following categories: for the elderly, for adults with chronic somatic diseases, adults with mental illness or intellectual disability (mentally retarded) and children with mental illness or intellectual disability. The present study was conducted in 8 stationary establishments: 3 institutions for mentally retarded adults or adults with a psychiatric disease, 1 institution for children and adolescents with intellectual disability or psychiatric disease, 4 institutions for adults with chronic somatic diseases.

A total of 1163 patients from 8 social assistance homes were screened for HBsAg. The cases were all HBsAg positive residents in the institutions. Information about socio-demographic details and risk factors was collected from caretakers. The hepatitis B sAg/eAg test (Binax Inc, Portland, Maine) was used to detect HBsAg in whole blood samples obtained by finger puncture. It has been previously shown that sensitivity of the test was satisfactory for the purposes of population screening. In a study by Clement et al. clinical sensitivity and specificity of the test for HBsAg were 99.75 and 99.32% respectively (8). The assays were performed according to manufacturer's recommendations. The capillary blood was collected in a calibrated capillary and added to the top of the pink and white pad on the assay card. The result was read after 10 min through the viewing window. All positive results were confirmed by commercial ELISA tests (AxSym HBs 2.0 Abbott Laboratories).

Cases in our study were defined as all subjects with positive result of HBeAg test and positive result of ELISA test. Controls were selected from the group of patients with

negative result of the screening HBs/HBeAg test. Two negative controls were selected per each positive case. The following criteria were used for selection of controls: two consecutive names on the list of residents of the same institution, age and sex-matched. We collected more detailed information about cases and controls from their caretakers using a structured questionnaire. The factors considered in the questionnaire were as follows: HBV vaccination status, previous results of testing for HBsAg if available, information about presence of certain clinical conditions: Down syndrome, mental retardation, schizophrenia, epilepsy, cerebral palsy, intravenous drug use, history of blood transfusions, hospitalisations, surgeries, pregnancies, endoscopies

The calculations were performed with the use of statistical package Statistica Pl. Differences in frequencies were compared using the chi square test or Fisher's exact test as appropriate. Differences between two means were compared using t-test. A p-value of less than 0,05 was considered significant.

The Research Ethics Committee at the Medical University of Białystok, Poland, approved the study protocol. Informed consent was obtained from all non-mentally retarded adult subjects and from guardians of mentally retarded persons.

RESULTS

Altogether 1163 residents were screened for HBsAg and 33 (2,8%) patients were found to be HBsAg positive. The studied group constituted 46,7% of the whole population of residents of social assistance homes in Podlaskie Voievodship. The residents were 18-104 years old, mean age – 50,4 years, $SD \pm 19,4$. Characteristics of residents of social assistance homes are presented in table I. The prevalence of HBsAg in different institutions ranged from 0,0% to 9,7%. As many as 29/33 (87,9%) of all HBsAg positive cases were residents of only two institutions (in one of them the prevalence of HBsAg was 9,7% and in the other 3,4%). In three institutions no cases with HBsAg were found.

Altogether the prevalence of HBsAg in residents of social assistance homes for mentally retarded or with a psychiatric condition was 30/691 (4,3%) and only 3/472 (0,6%) among residents of homes for patients with somatic diseases, $p < 0,05$. Subjects with HBsAg were significantly younger than HBsAg-negative subjects – mean age 40,9 years ($\pm 15,9$) and 58,9 years ($\pm 19,2$), $p < 0,05$ for the two groups respectively. Among residents with HBsAg there were also significantly more males 27/33 (81,8%) than in HBsAg-negative group 641/1130 (56,7%) $p < 0,05$. Number of HBsAg positives was also significantly related to number of years spent in a social assistance home – the highest prevalence (5,6%) was noted among those staying over 10 years (5,6%) lower in the group 6-10 years (2,1%) and the lowest in those staying up to 5 years – 1,4%, $p < 0,05$. Younger age at admission was another factor that was significantly associated with HBsAg prevalence (Fig. 1). While the rate of HBsAg positivity was 8,4% in those admitted at the age less than 18 years, it equalled only 0,3% in those admitted at the age of more than 64 years, $p < 0,05$. Table II presents frequencies of studied factors among 33 cases and 66 age and sex-matched HBsAg negative controls. The only factor that was significantly associated with HBsAg seropositivity in our study was history of previously positive result for HBsAg. Altogether 23 out of 33 cases (69,7%) had been previously positive for HBsAg and only 10 (30,3%) represented new discovered HBV infections. Of the 99 patients (cases and controls), for whom

Table I. Characteristics of the patients from 8 social assistance homes and HBsAg seropositivity rate

Tabela I. Charakterystyka pacjentów z 8 domów opieki społecznej i częstość występowania HBsAg

Social assistance home type	No screened	Females n (%)	Males n (%)	Mean age years (\pm SD)	Length of stay – years (\pm SD)	HBsAg positive n (%)
Z (intellectual disability)	196	60 (30,6)	136 (69,4)	28,8 (8,0)	18,3 (8,8)	19 (9,7)
Ch (psychiatric disorders)	294	66 (22,5)	228 (77,6)	56,6 (12,1)	15,8 (12,2)	10 (3,4)
T (psychiatric disorders)	21	21 (100)	0 (0,0)	63,9 (14,9)	5,4 (1,3)	0 (0,0)
G (psychiatric disorders)	180	67 (37,2)	113 (62,8)	53,4 (13,4)	1,4 (0,5)	1 (0,6)
Cz (somatic diseases)	97	54 (55,7)	43 (44,3)	71,8 (11,5)	5,2 (4,3)	0 (0,0)
U (somatic diseases)	114	74 (64,9)	40 (35,1)	71,8 (14,3)	5,8 (7,6)	0 (0,0)
J (somatic diseases)	101	52 (51,5)	49 (48,5)	73,0 (12,0)	6,1 (6,9)	2 (2,0)
S (somatic diseases)	160	101 (63,1)	59 (36,9)	74,6 (12,9)	4,2 (3,8)	1 (0,6)
Total	1136	495 (42,6)	668 (57,4)	58,4 (19,4)	9,5 (10,2)	33 (2,8)

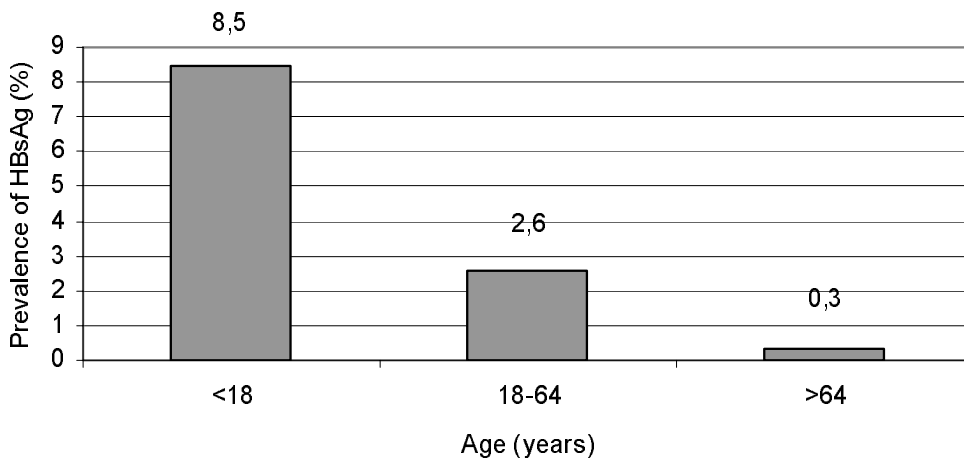


Fig. 1. Prevalence of HBsAg in relation to age at admission to a social assistance home

Ryc. 1. Częstość występowania HBsAg w zależności od wieku przy przyjęciu do domu opieki społecznej

Table II. Risk factors for HBV infection among cases and controls

Tabela II. Czynniki ryzyka zakażenia HBV w grupie badanej i kontrolnej

Factor studied	Cases n=33	Controls n=66
Previous HBV vaccination	21 (63,6)	50 (75,8)
History of hepatitis	2 (6,1)	3 (4,6)
Previously positive for HBsAg	23 (69,7)	3 (4,6) ^a
Mentally retarded	17 (51,5)	29 (66,0)
Schizophrenia	7 (21,2)	12 (18,2)
Epilepsia	1 (3,0)	5 (7,6)
Down syndrome	3 (9,1)	2 (3,0)
Cerebral palsy	2 (6,1)	2 (3,1)
Transfusions	1 (3,0)	1 (1,5)
Surgeries	5 (15,2)	12 (18,2)
Endoscopies	3 (9,1)	1 (1,5)

^a- p<0.05

more detailed information was available, 71 (71,7%) had been previously vaccinated. As many as 21/33 (63,6%) of HBsAg-positive subjects provided history of HBV immunizations.

DISCUSSION

In this study we found HBsAg in 2,8% of residents of stationary social care institutions in North-Eastern Poland. This is higher than prevalence of 1-2% estimated for general population in Poland.

The distribution of HBsAg was not uniform. Nearly 90% of all positive results were found in 2 of the 8 studied institutions. This is probably associated with easy spread of HBV among residents if sources of infections (infected persons) are present but also may reflect social and medical background of residents of the two considered social assistance homes. The two establishments offered care to people with intellectual disability and/or psychiatric disorders and one of them was designated for care of children, adolescents and young people. It has been previously shown that mental disability in institutionalized patients predisposes to infection with HBV (1,3, 9). Down syndrome is associated with particularly high rates of HBsAg positivity when compared with other groups of mental retardation (3) According to Asensio et al. (2) in case of mentally handicapped aggressive behaviours accompanied by bites, scratches and injuries are responsible for HBV spreading rather than use of contaminated medical equipment. In our study 30 out of 33 HBsAg positive subjects (90,9%) were residents of social assistance homes for mentally retarded or with a psychiatric disease. Majority of 177 residents in the home with the highest prevalence of HBsAg (9,7%) in our study have stayed there since early childhood. Young age at admission to social assistance homes is known to correlate with higher risk of infection

with HBV (1). Universal HBV vaccination programme of all infants and adolescents in Poland virtually eliminated the risk of HBV infection among young newcomers to social assistance homes. The information about this risk factor is however important for selecting adult population of stationary institutions for HBV screening. Younger age of HBsAg carriers in our study reflects longer stay of younger persons in the institutions and greater dependency on care received from the others (subjects mentally retarded, with Down syndrome or cerebral palsy). On the other hand residents of the homes for adults with psychiatric or somatic disease, although older, had shorter length of stay in the institutions and thus could be less exposed to HBsAg. Male sex was another risk factor in our study for HBsAg positivity. National data for whole Polish population also confirm higher incidence of acute hepatitis B in males than in females (6,4 and 3,2 per 100 000 in 2003 for the two groups respectively) (7). Higher rates of HBsAg carriers among men were also found in other countries (10,11). It is possible that some risky behaviours are more prevalent among males (more sexual partners, intravenous drug use, aggressive behaviour favouring injuries and close contacts) (11). It is comforting that the staff in our study were aware of HBsAg status in majority of HBsAg positive cases. This is important for two reasons: firstly currently available antiviral treatment delays progression of chronic liver disease and in some cases offers cure and elimination of the source of infection and secondly inhabitants staying in social homes with HBsAg positive persons should be vaccinated against HBV.

We also found that majority of HBV carriers in our study had been vaccinated against HBV. This finding reflects policy of immunizing without screening for HBsAg. It seems reasonable to suggest that testing for HBsAg should be performed prior to HBV immunizations at least in those institutions where HBsAg carriers had been found among the residents and in those subjects who have been institutionalized since early childhood. It should be stressed that immunizations have no negative effect on the course of hepatitis B. The rationale for screening for HBsAg in high-risk individuals is that it can identify individuals with chronic HBV infection who may benefit from antiviral treatment and additionally such policy may be cost-effective (saving the cost of three unnecessary injections).

We failed to find significant relationships between HBsAg status and certain factors like schizophrenia, Down syndrome, cerebral palsy. However the number of detected cases was small and decreased the power of the study to detect significant differences.

CONCLUSIONS

We conclude that: a) majority of HBsAg positive cases occur in institutions for persons with intellectual disability and psychiatric disorders b) the main predictors of HBsAg positivity are young age at admission and longer stay at the institution c) screening for HBsAg should be considered among residents with high risk of HBV infection (with mental disorder, with young age at admission to institution).

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CZĘSTOŚĆ WYSTĘPOWANIA HBsAg WŚRÓD PENSJONARIUSZY DOMÓW POMOCY SPOŁECZNEJ W WOJEWÓDZTWIE PODLASKIM (POLSKA PÓLNO-CNO-WSCHODNIA)

STRESZCZENIE

Cel. Celem badań było określenie częstości występowania HBsAg wśród pensjonariuszy domów pomocy społecznej, zidentyfikowanie czynników ryzyka przenoszenia HBV oraz celowości oznaczania HBsAg przed szczepieniami.

Metody. U mieszkańców domów pomocy społecznej oznaczano HBsAg przy pomocy szybkiego testu (hepatitis B sAg/eAg rapid test), a wyniki dodatnie potwierdzano standardową metodą ELISA.

Wyniki. Badaniom poddano łącznie 1163 mieszkańców domów pomocy społecznej i u 33 (2,8%) potwierdzono obecność HBsAg. Częstość występowania HBsAg w poszczególnych domach wynosiła od 0,0% do 9,7%. Spośród wszystkich osób z HBsAg 87,9% było mieszkańcami tylko dwóch instytucji. Większość przypadków z HBsAg stwierdzono u osób z upośledzeniem umysłowym i zaburzeniami psychicznymi (90,9% wszystkich przypadków). Głównymi czynnikami związanymi z obecnością HBsAg były ponadto: płeć męska i młody wiek w chwili przyjęcia do domu opieki społecznej. Aż 21 spośród 33 osób z HBsAg (63,6%) poddano wcześniej szczepieniom przeciw wzw B.

Wnioski. Wyniki badań wskazują na potrzebę oznaczania HBsAg przynajmniej w niektórych grupach pensjonariuszy domów pomocy społecznej (osoby przyjęte w młodym wieku, z upośledzeniem umysłowym, z chorobą psychiczną).

REFERENCES

1. Marena C, Bignamini A, Meloni F, et al. Seroprevalence of hepatitis B virus markers and risk factors in patients and staff of Italian residential institution for the mentally disabled. *J Clin Epidemiol* 1996;49:1009-12.
2. Asensio F, Bayas JM, Bertran M, et al. Prevalence of hepatitis B infection in long – stay mentally handicapped adults. Prevalence of hepatitis B infection in long-stay mentally handicapped adults. *Eur J Epidemiol* 2000;16:725-9.
3. Van Ditzhuijsen TJ, de Witte – van der Schoot E, van Loon AM, et al. Hepatitis B virus infection in an institution for mentally retarded. *Am J Epidemiol* 1988;128:629-38.
4. FitzSimons D, Van Damme P. Prevention and control of hepatitis B in central and eastern Europe and the newly independent states, Siofok, Hungary, 6-9 October 1996. Strengthening immunization systems and introduction of hepatitis B vaccine in central and eastern Europe and the newly independent states. *Vaccine* 1997;15:1595-7.
5. Juszczyk J, Gładysz A. Hepatitis B epidemiology in Poland. *Hepatologia Polska* 1997;4:65-70.
6. Magdzik W. Hepatitis B epidemiology in Poland, Central and Eastern Europe and the newly independent states. *Vaccine* 2000;18 (Suppl 1):S13-6.
7. National Institute of Hygiene. Reports of Polish Institute of Hygiene 2004. <http://www.pzh.gov.pl/>
8. Clement F, Dewint P, Leroux-Roels G. Evaluation of new rapid test for the combined detection of hepatitis B virus surface antigen and hepatitis B virus e antigen. *J Clin Microbiol*, 2002;40: 4603-6.
9. Devuyt O, Maesen-Collard Y. Hepatitis B in a Belgian institution for mentally retarded patients: an epidemiological study. *Acta Gastroenterol Belg* 1991;54:12-8.

10. Clarke SK, Caul EO, Jancar J, et al. Hepatitis B in seven hospitals for the mentally handicapped. *J Infect* 1984;8:34-43.
11. Mehmet D, Meliksah E, Serif Z, et al. Prevalence of hepatitis B infection in the southeastern region of Turkey: comparison of risk factors for HBV infection in rural and urban areas. *Jpn J Infect Dis* 2005;58:15-9.

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