

Prevalence of hepatitis B and C markers among refugees in Athens

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Abstract

AIM: To assess the prevalence of hepatitis B and C serological markers in a population of refugees living in Athens.

METHODS: One hundred and thirty refugees (81 males and 49 females, mean age \pm SD: 31.7 \pm 8 years) were included in the study. The hepatitis B virus surface antigen (HBsAg), the hepatitis B virus core antibody (anti-HBc) and the hepatitis C virus antibody (anti-HCV) were detected using a third-generation immunoassay.

RESULTS: Twenty individuals (15.4 %) were HBsAg positive and 69 (53.1 %) were anti-HBc positive. The prevalence of HBsAg and anti-HBc was higher among refugees from Albania and Asia (statistical significant difference, $P < 0.008$ and $P < 0.001$ respectively). The prevalence of these markers was found irrelevant to age or sex. Anti-HCV was detected in the serum of 3 individuals (2.3 %). No differences among age, sex or ethnicity regarding anti-HCV prevalence were found.

CONCLUSION: It can be concluded that refugees living in Athens are an immigrant population characterized by a high incidence of HBV infection. The prevalence of HBV markers is higher among refugees from Albania and Asia. It is therefore believed that the adherence to general precautions and the initiation of HBV vaccination programs will be necessary in the future, especially in these communities. Although the prevalence of HCV infection seems to be relatively low, extended epidemiological surveys are needed to provide valid results.

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INTRODUCTION

During the last decade, refugees from countries with an increased prevalence of infectious diseases, (i.e. viral hepatitis, AIDS and tuberculosis) have settled in Greece. The crowded living conditions and the avoidance of well-organized places of sheltering, due to the fear of deportation or expulsion, characterize immigrant populations and facilitate the spread of these diseases^[1].

Assessing the prevalence of viral hepatitis among refugees

is necessary in order to plan health control measures regarding primary and secondary prevention and prophylaxis for the entire population^[2,3]. Both prevention and prophylaxis are of great importance for public health, as chronic viral hepatitis remains the main etiology for the development of hepatocellular carcinoma, in our country^[4] and worldwide^[5-7]. In Greece, previous studies on Albanian refugees showed a high prevalence of hepatitis B^[8,9]. However, data regarding refugees of other nationalities is limited. Moreover, insufficient information is available on the prevalence of hepatitis C.

The aim of this study was to assess the prevalence of hepatitis B and C serological markers in a population of refugees of various nationalities, living in Athens.

MATERIALS AND METHODS

Materials

The study involved all refugees referred to the outpatient clinic of our Department for a health certificate, during a six-month period. A total of 130 refugees (81 men and 49 women), aged between 18 and 69 years (mean age \pm SD: 31.7 \pm 8 years old), were studied. The local ethics committee approved the study and signed informed consent was obtained from each participant.

Methods

All subjects were interviewed by means of a structured questionnaire for general demographic details (age, sex, ethnic origin) and risk factors for hepatitis B and C infections (blood transfusions, intravenous drug use, tattoos). Thereafter, 10 ml of blood was obtained by venesection and the serum was separated by centrifugation. Each serum sample was coded and stored at -20 °C. The hepatitis B virus surface antigen (HBsAg), the hepatitis B virus core antibody (anti-HBc) and the hepatitis C virus antibody (anti-HCV) were detected by a third-generation enzyme-linked immunosorbent assay (ELISA, ABBOTT, EIA-3). This immunoassay method was used according to the instructions of the manufacturer.

Statistical analysis

Results were expressed as mean \pm SD. A Chi - squared (χ^2) test with Yate's correction was used to detect differences between groups and predictive indices. χ^2 -analysis was performed using the SPSS program (version 9.0, SPSS Inc., IL, USA). $P < 0.05$ were considered statistically significant.

RESULTS

Albanian refugees represented the higher proportion (59 %) in our study population. Refugees from eastern European countries (the former USSR, Poland, Bulgaria and Romania), Asia and Africa, were also examined. The mean age did not differ among the various ethnic groups. Male sex was prominent in Albanian (67 %) and Asian (100 %) refugees. The demographic characteristics of the 130 subjects were shown analytically in Table 1.

Twenty individuals (15.4 %) were HBsAg positive and 69 (53.1 %) were anti-HBc positive. Table 2 showed the distribution of hepatitis B markers according to sex. The

prevalence of HBsAg and anti-HBc was higher in men than that in women but the difference was not statistically significant ($P=0.23$ and $P=0.14$ respectively). Finally, the mean age did not differ significantly between seropositive and seronegative for these markers groups [HBsAg (+): 31.8 ± 6 years, HBsAg (-): 32.7 ± 7 years, $P=0.66$; and anti-HBc (+): 30.9 ± 7 years, anti-HBc (-): 32.8 ± 6 years, $P=0.23$].

A total of 3 individuals (2.3 %), two men (aged 32 and 34) and one woman aged 33 were anti-HCV positive. No differences in age ($P=0.71$) and sex ($P=0.87$) regarding anti-HCV prevalence were found.

Table 3 showed the distribution of hepatitis B and C serological markers according to ethnicity. The prevalence of HBsAg and anti-HBc was higher among refugees from Albania and Asia (statistically significant difference, $P<0.008$ and $P<0.001$, respectively). Although a high prevalence of hepatitis C infection (12.5 %) characterized African refugees, no statistically significant difference among the various groups ($P=0.76$) was found.

Table 1 Demographic characteristics of refugees

Ethnicity	n (%)	Sex (M/F)	Age (mean±SD)
Albania	76 (59)	51/25	31.8±8.5
East europe	35 (27)	15/20	32.5±10.2
Asia	11 (8.5)	11/0	31.4±6.2
Africa	8 (6.2)	4/4	31.1±6.7
Total	130	81/49	31.7±8.5

Table 2 Distribution of hepatitis B serological markers according to sex

Sex	n	HBsAg(+)	Anti-HBc(+)	HBsAg, anti-HBc(-)
Males	81	15 (18.5 %)	47 (58 %)	19 (23.5 %)
Females	49	5 (10.2 %)	22 (45 %)	22 (44.8 %)
Total	130	20 (15.4 %)	69 (53.1 %)	41 (31.5 %)

Table 3 Distribution of hepatitis B and C serological markers according to ethnicity

Ethnicity	n	HBsAg(+)	Anti-HBc(+)	Anti-HCV(+)
Albania	76	17 (22.4 %) ^a	54 (71 %) ^a	1 (1.3 %)
E Europe	35	0 (0)	8 (23 %)	1 (2.8 %)
Asia	11	3 (27.3 %) ^b	5 (45 %) ^b	0 (0)
Africa	8	0 (0)	2 (25 %)	1 (12.5 %)
Total	130	20 (13.4 %)	69 (53.1 %)	3 (2.3 %)

^a $P<0.008$, ^b $P<0.001$.

DISCUSSION

Hepatitis B and C are widespread infectious diseases representing major health problems. The worldwide seroprevalence of HBsAg and anti-HCV is estimated to be 5 % and 1 %, respectively. However, marked geographic variation exists. Local factors, such as the ethnic composition of the population, influence the prevalence of these infections in a particular community^[2,3]. It is well known that refugees constitute a special social group in a geographical area. They often live under conditions that facilitate the spread of infectious diseases. Moreover, the prevalence of chronic infections among them depends on the endemicity of these diseases in the country of origin. In the present study, the prevalence of hepatitis B and C serological markers among

refugees of various nationalities living in Athens was evaluated. Greece has been traditionally considered as a region of intermediate endemicity for HBV infection and estimated prevalence rates for HBsAg and anti-HBc were 3 % and 30-40 %, respectively^[10]. Recent information regarding the seroprevalence of these markers in the Greek population is not available. However, in recent studies, blood donors and recruits in the army had an HBsAg positivity below 1 %, possibly indicating a shift towards lower endemicity in Greece^[11]. In the population of our study, the prevalence of HBsAg and anti-HBc was extremely high (15.4 % and 53.1 %, respectively), similar to that reported in countries of high endemicity for HBV infection. In Greece, the reported HBsAg prevalence even in high-risk groups for HBV infection, such as HIV-patients (13.3 %)^[12] and drug addicts (6.9 %)^[13,14], is lower than that observed in our population. Higher HBsAg prevalence (17.2 %) has been reported only in Kurdish of a refugee camp in Athens, a social group characterized by particularly unhealthy living conditions^[15].

An increased prevalence of hepatitis B serological markers has been reported in previous studies concerning Albanian refugees in Greece and Italy^[8,9,16,17]. Our results confirm that Albanian refugees have a high seroprevalence of HBV markers, which possibly reflects the high endemicity of HBV infection in Albania. It is also suggested that Asian refugees should be considered as another group with high prevalence of chronic HBV infection. If a larger epidemiological research confirms our results, then future preventive intervention could be conducted for those communities of refugees that are at highest risk.

The prevalence of anti-HCV in the population of refugees was relatively low (2.3 %) and no differences among various nationalities were found. A previous study among Albanian refugees in northwestern Greece showed anti-HCV seroprevalence of 1.75 %^[8]. To our knowledge, the present study is the first concerning refugees living in Athens. In Greece, several reports have shown the important role of HCV in the development of cirrhosis and hepatocellular cancer^[18,19]. However, most of the epidemiological research for the prevalence of hepatitis C concerns specific population groups, such as blood donors, medical staff, and chronic alcoholics^[20-22]. Recently, a random community-based study of the general population in the Greek Island of Zakynthos showed lower prevalence of hepatitis C (1.25 %) compared to our results^[23]. However, this difference is slight. Therefore, refugees living in Athens cannot be considered as a potential reservoir of HCV infection for the indigenous population.

It is concluded that refugees living in Athens are characterized by a high prevalence of HBV infection. The seroprevalence of HBV markers is higher among refugees from Albania and Asia. We, therefore, believe that the adherence to general precautions and an effort to improve living conditions will be necessary in the future, especially in these communities. The initiation of HBV vaccination programs is also needed. Although the prevalence of HCV infection seems to be relatively low among refugees living in Athens, extended epidemiological surveys are needed to provide valid results.

REFERENCES

- Ackerman LK. Health problems of refugees. *J Am Board Fam Pract* 1997; **10**: 337-348
- Terrault N, Wright T. Viral Hepatitis A through G. In: Sleisenger and Fortdran's, eds. *Gastrointestinal and Liver Disease. Pathophysiology, diagnosis and management*. 6th ed. Philadelphia: Saunders 1998: 1123-1170
- Sherlock S. Chronic Hepatitis. In: Sherlock S, Dooley J, eds. *Diseases of the liver and biliary system*. 10th ed. London: Blackwell Science Ltd 1997: 303-336

- 4 **Kuper HE**, Tzonou A, Kaklamani E, Hadziyannis S, Tasopoulos N, Lagiou P, Trichopoulos D, Stuver S. Hepatitis B and C viruses in the etiology of hepatocellular carcinoma; a study in Greece using third-generation assays. *Cancer Causes Control* 2000; **11**: 171-175
- 5 **Yang JM**, Wang RQ, Bu BG, Zhou ZC, Fang DC, Luo YH. Effects of HCV infection on expression of several cancer-associated gene products in hepatocellular carcinoma. *World J Gastroenterol* 1999; **5**: 25-27
- 6 **Rabe C**, Pilz T, Klostermann C, Berna M, Schild HH, Sauerbruch T, Caselmann WH. Clinical characteristics and outcome of a cohort of 101 patients with hepatocellular carcinoma. *World J Gastroenterol* 2001; **7**: 208-215
- 7 **Tang ZY**. Hepatocellular carcinoma-cause treatment and metastasis. *World J Gastroenterol* 2001; **7**: 445-454
- 8 **Dalekos GN**, Zervou E, Karabini F, Tsianos EV. Prevalence of viral markers among refugees from southern Albania: increased incidence of infection with hepatitis A, B, and D viruses. *Eur J Gastroenterol Hepatol* 1995; **7**: 553-558
- 9 **Malamitsi PA**, Papacharitonos S, Sotos D, Tzala E, Psychogios G, Hatzakis A. Prevalence study of different hepatitis markers among pregnant Albanian refugees in Greece. *Eur J Epidemiol* 1996; **12**: 297-301
- 10 **Kyriakis KP**, Foudoulaki LE, Papoulia EI, Sofroniadou KE. Seroprevalence of hepatitis B surface antigen (HBsAg) among first-time and sporadic blood donors in Greece: 1991-1996. *Transfus Med* 2000; **10**: 175-180
- 11 **Stamouli M**, Gizaris V, Totos G, Papaevangelou G. Decline of hepatitis B infection in Greece. *Eur J Epidemiol* 1999; **15**: 447-449
- 12 **Dimitrakopoulos A**, Takou A, Haida A, Molangeli S, Gialeraki A, Kordossis T. The prevalence of hepatitis B and C in HIV-positive Greek patients: relationship to survival of deceased AIDS patients. *J Infect* 2000; **40**: 127-131
- 13 **Roumeliotou-Karayannis A**, Tassopoulos N, Kotsianopoulou M, Karpodini E, Trichopoulou E, Papaevangelou G. Prevalence of HBV HDV and LAV/HTLV-III infections among Greek drug addicts. *Prog Clin Biol Res* 1987; **234**: 403-404
- 14 **Roumeliotou A**, Karayiannis A, Tassopoulos N, Karpodini E, Trichopoulou E, Kotsianopoulou M. Prevalence of HBV, HDV and HIV infections among intravenous drug addicts in Greece. *Eur J Epidemiol* 1987; **3**: 143-146
- 15 **Skliros E**, Lionis C, Foudoulaki L, Sotiropoulos A, Kouroumalis E, Spandidos D. Hepatitis B and C markers in a Kurdish refugee camp in Greece. *J Gastroenterol Hepatol* 2001; **16**: 839-840
- 16 **Santantonio T**, Lo Caputo S, Germinario C, Squarcione S, Greco D, Laddago V. Prevalence of hepatitis virus infections in Albanian refugees. *Eur J Epidemiol* 1993; **9**: 537-540
- 17 **Chironna M**, Germinario C, Lopalco PL, Quarto M, Barbuti S. HBV, HCV and HDV infections in Albanian refugees in Southern Italy (Apulia region). *Epidemiol Infect* 2000; **125**: 163-167
- 18 **Hadziyannis SJ**, Gianhoulis G, Hadziyannis E, Kaklamani E, Alexopoulou A, Dourakis S. Hepatitis C virus infection in Greece and its role in chronic liver disease and hepatocellular carcinoma. *J Hepatol* 1993; **17**(Suppl 3): 72-77
- 19 **Goritsas C**, Athanasiadou A, Arvaniti A, Lampropoulou-Karatza C. The leading role of Hepatitis B and C viruses as risk factors for the development of hepatocellular carcinoma. *J Clin Gastroenterol* 1995; **20**: 220-224
- 20 **Manesis E**. Hepatitis C in the general Greek population. In: S Hadziyannis, eds. *Hepatitis C*. Athens: *Paschalidis Editions* 1997; 25-33
- 21 **Koulentaki M**, Spanoudakis S, Kantidaki E, Drandakis P, Tzagarakis N, Biziagos. Prevalence of hepatitis B and C markers in volunteer blood donors in Crete. A 5-year study. *J viral Hepat* 1999; **6**: 243-248
- 22 **Dalekos GN**, Zervou E, Merkouropoulos MH, Tsianos EV. Prevalence of hepatitis B and C viruses infection in chronic alcoholics with or without liver disease in Ioannina, Greece: low incidence of HCV infection. *Eur J Epidemiol* 1996; **12**: 21-25
- 23 **Goritsas C**, Plerou I, Agaliotis S, Spinthaki R, Mimidis K, Velissaris D. HCV infection in the general population of a Greek island: Prevalence and risk factors. *Hepatogastroenterology* 2000; **47**: 782-785