

HBV and HCV infection among non-European Union immigrants in North-East Italy

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SUMMARY

The status of hepatitis B virus (HBV) and hepatitis C virus (HCV) infection among non-European Union (non-EU) immigrants in North-East Italy was evaluated. Among the 1683 individuals tested the prevalence of HBsAg was 8·9% (150 subjects) and of HBV antibodies (anti-HBc with/without anti-HBs) was 38·9% (654 subjects). The distribution of HBV serological markers showed significant differences according to region of origin; the highest prevalence of infection (76·9%) and carriage (16·1%) was found in immigrants from sub-Saharan Africa. Among the 933 individuals screened for HCV infection, prevalence of antibody was much lower (0·9%) than that observed in the Italian general population (3·2–12·6%). The large number of HBV carriers among immigrants could increase the number of new adult infections due to life-style habits or professional risks in the host population. In contrast, the risk of HCV spread from non-EU immigrants is very low.

INTRODUCTION

Hepatitis B virus (HBV) infection is endemic in certain regions of the world such as sub-Saharan Africa, the Middle East and Southeast Asia. In these areas of high endemicity, infection is usually acquired in early childhood either at birth or by early horizontal transmission [1–3]. Most developed countries currently have a low prevalence of HBV infection [4]. In Italy, a significant decline in prevalence has been seen in the last decade. It is believed that in younger age groups this is due partly to vaccination but mostly to the increased knowledge and mass education on the routes of transmission, with consequent and increased use of disposable syringes and other medical instruments [5–7].

Hepatitis C virus (HCV) infection occurs worldwide and in all the racial/ethnic groups studied [8]. It is a blood borne virus and initial studies focused on groups at risk of infection as a result of direct percutaneous exposure such as transfusion and drug use [9–11]. A recent study carried out in Italy to assess the risk factors associated with HCV demonstrated the spread of infection seems to have occurred through inapparent parenteral routes mainly in last decades [12]. At present acute hepatitis C is found to occur mostly among young adults with high-risk behaviours or life-styles [13, 14].

During the last 10 years the trend of immigration into Italy has increased and the supposed high prevalence of communicable disease among these subjects has resulted in widespread public health concern [15, 16]. The present study was carried out to

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Table 1. Prevalence of HBsAg carriers in 1683 immigrants by sex and region of origin

Region of origin	Males		Females	
	No. tested	Positive (%)	No. tested	Positive (%)
Sub-Saharan Africa	306	17.0	66	12.1
Eastern Europe	326	14.4	85	10.6
North Africa/Middle East	564	5.1	71	1.4
Southeast Asia	45	4.4	21	0.0
Latin America	48	2.1	151	0.7

evaluate the status of HBV and HCV infection among non European Union (non-EU) immigrants in the Veneto Region of North-East Italy.

METHODS

Study population

The study population included 1683 non-EU immigrants. The mean age was 28.5 years (range 0–76); 1289 (76.6%) were male and 394 (23.4%) female. These subjects were consecutively recruited at the Public Health Department for Immigrant Clinic of Treviso in North-East Italy during October 1989–December 1995. This is a special clinic open to any type of immigrants (regularly registered or refugees) who wish to obtain a certificate of 'good health' for work, or vaccinations for children, and/or any type of minor medical help. In fact, those attending are mainly asymptomatic.

A coded questionnaire recording sociodemographic and sanitary data was compiled for each subject. Generally, these subjects could not supply valid documentation of previous vaccination. The immigrants were grouped according to region of origin.

Laboratory tests

All serum samples were tested for hepatitis B surface antigen (HBsAg) and those negative also for anti-hepatitis B core antigen (anti-HBc). All tests were carried out using an enzyme immunoassay (AUSAB, AUSZYME, CORZYME, Abbott Labs, IL, USA) according to the manufacturer's recommendations including the specific confirmatory tests. HBsAg positive subjects were further studied for liver disease.

Serum samples of 933 subjects (collected from August 1991) were also tested for antibodies against the hepatitis C Virus (HCV) using a commercially

available second generation ELISA (HCV ELISA System, Abbott Labs, IL, USA). Anti-HCV positive subjects were tested again (including with RIBA test) and studied for liver disease.

Statistical analyses were carried out using EpiInfo 6.01 software supplied by the Centres for Disease Control, Atlanta (GA, USA). Frequencies were compared by χ^2 test (Mantel-Haenszel).

RESULTS

Hepatitis B

Of the 1683 non-EU immigrants studied, 635 (37.8%) were from North Africa/Middle East (90.1% from Morocco), 411 (24.4%) were from Eastern Europe (93.6% from Albania and former Yugoslavia), 372 (22.1%) were from sub-Saharan Africa (82.3% from Senegal and Ghana), 199 (11.8%) were from Latin America (mostly from Brazil and S. Domingo) and 66 (3.9%) were from Southeast Asia (mostly from Sri Lanka, China and Philippines).

Among the 1683 subjects tested 150 (8.9%) were HBsAg positive and 654 (38.9%) had anti-HBc \pm anti-HBs antibodies.

In each subgroup the prevalence of HBsAg positive was higher in males than in females (Table 1), however the differences observed were not statistically significant. Table 2 shows prevalences of HBV markers by age, sex and region of origin. In children < 15 years, 4/17 were HBsAg carriers (23.5%) (mean age 4.7, range 3–7), without any difference by sex. In adult males (age 15–44) 127/1247 were HBsAg positive (10.2%), whereas in adult females it was 4.6% (17/370 subjects). The prevalence of anti-HBc \pm anti-HBs positivity ranged from 17.6 in children < 15 to 55.1 in adults > 44 years.

The distribution of HBV serological markers showed significant differences according to region of origin ($P < 0.001$ comparing high endemicity areas

Table 2. Prevalence of any HBV markers in 1683 immigrants according to age group, sex and region of origin

	No. tested	HBsAg+ (%)	Anti-HBc +, ± anti-HBs + (%)
Age group (years)			
0-14	17	23.5	17.6
15-29			
Males	745	10.5	40.4
Females	269	4.1	29.4
30-44			
Males	502	9.8	41.2
Females	101	5.9	36.6
45 and over	49	4.1	55.1
Region of origin			
Sub-Saharan Africa	372	16.1	60.8
Eastern Europe	411	13.6	47.2
North Africa/Middle East	635	4.7	29.9
Southeast Asia	66	3.0	19.7
Latin America	199	1.0	15.6

Table 3. Data on the anti-HCV positive subjects

Age (year)	Sex	Region of origin	HBsAg	Anti-HBc ± anti-HBs	Risk factors
21	m	Eastern Europe	-	+	n.i.*
30	m	Latin America	-	+	n.i.
31	f	Eastern Europe	-	+	n.i.
36	m	North Africa/Middle East	-	+	Multiple surgical interventions
19	f	Eastern Europe	-	-	Presence of STD†
29	m	North Africa/Middle East	-	-	Multiple partners
29	f	Eastern Europe	-	-	Occupational
34	m	Latin America	-	-	Multiple partners, HIV +

* n.i., information not available.

† STDs, sexually transmitted diseases.

with low endemicity areas), varying from the highest prevalence of infection (76.9%) and carriage (16.1%) in immigrants from sub-Saharan Africa to the lowest frequency of overall infection markers and carriage (16.6% and 1.0% respectively) in immigrants from Latin America.

Hepatitis C

Among the 933 subjects screened for HCV infection, antibodies to hepatitis C were detected in 8 (0.9%) (mean age 28.6 ± 5.9 , range 19-36). No significant differences were observed in the prevalence of anti-HCV according to age group, sex and region of origin. More detailed characteristics of anti-HCV positive subjects are reported in Table 3.

DISCUSSION

The increase in immigration from developing countries raises two main public health problems: first, immigration-related public health risks can increase in the host population; second, new problems to the health of immigrants can occur as a result of exposure to Western risk factors.

Our study included large number of immigrants to Italy from various world-wide regions and they can be reasonably considered a representative sample of immigrants from non-EU countries to our region. The population studied is mainly of recent immigration (mean years of immigration 2.0, range 0.2-26.9) thus they tend to reflect the situation of the origin country.

High rates of HBV infection were found in immigrants from sub-Saharan Africa and Eastern

Europe indicating a persistent high endemicity of HBV infection among these populations. In areas of high HBV endemicity the infection is usually acquired in early childhood [17]; this is confirmed by the high prevalence of HBsAg positive children even in our small sample. The prevalence of HBV immune subjects was steadily increasing with age and was paralleled by a decrease of HBsAg positivity. This can reflect the rarity of new infections after childhood. This is consistent with the hypothesis that the spread of HBV can subside as immigrants living in Italy acquire local social and sanitary habits. In the near future the vaccination campaign is to be extended to the integrated immigrant families and this should decrease the HBV carrier rate, even among young generations.

So far, however, the integration of HBsAg positive immigrants into the local social context might lead to the spread of HBV infection among the non-immune indigenous population [15] through life style or occupational contacts. In fact, the epidemiology of new HBV infections in Italy is changing; HBV related acute hepatitis occurs mostly among unvaccinated adults with evidence of risky life-style habits (i.e. drug addiction, promiscuous sexual contacts, etc.) or professional accident (i.e. needle prick in non-immune health care workers) [14].

The finding is different as far as hepatitis C infection is concerned. In our study the prevalence of HCV antibodies among immigrants is very low and, according to the general population screenings, even lower than that observed in the general Italian population (3.2% in the North East Italy [18] and 12.6% in the Southern Italy [19]).

For such a low number of infected persons, considerations about specific HCV modes of transmission are difficult and must be interpreted with caution. However available information, reported in Table 3, indicate that all the anti-HCV subjects were adults, the most part of them with no history of obvious parenteral exposure.

In conclusion, the results of this study demonstrate that the prevalence of HCV infection seems to be similar or lower than that of the host population while that of HBV infection among immigrants from non-EU countries is still very high. This confirms that the main routes of transmission of HBV and HCV are different; transmission of HCV is mainly iatrogenic [12] while HBV transmission is mainly household or sexual [4, 20]. The risk of HCV spread from non-EU immigrants is very low. By contrast the large number

of HBV carriers among immigrants could increase the number of new adult infections due to life-style habits or professional risks.

REFERENCES

1. Kiire CF, African Regional Study Group. Hepatitis B infection in sub-Saharan Africa. *Vaccine* 1990; **8** Suppl: 107-12.
2. Toukan A, Middle East Regional Study Group. Strategy for the control of hepatitis B virus infection in the Middle East and North Africa. *Vaccine* 1990; **8** Suppl: 117-21.
3. Sung JL, Asian Regional Study Group. Hepatitis B virus eradication strategy for Asia. *Vaccine* 1990; **8** Suppl: 95-9.
4. Margolis HS, Alter MJ, Hadler SC. Hepatitis B: evolving epidemiology and implications for control. *Semin Liv Dis* 1991; **11**: 84-92.
5. Chiaramonte M, Trivello R, Stroffolini T, et al. Changing pattern of hepatitis B infection in children: a comparative seroepidemiological study (1979 vs 1989) in north-east Italy. *Ital J Gastroenterol* 1991; **23**: 347-50.
6. Corona R, Gandolfi C, Ferrigno L, et al. Hepatitis B in children in Italy: incidence and risk factors. *Eur J Epidemiol* 1994; **10**: 219-22.
7. Crovari P. Epidemiology of viral hepatitis B in Italy. *Vaccine* 1995; **13** Suppl 1: 26-30.
8. Alter MJ. Epidemiology of hepatitis C. *Eur J Gastroenterol Hepatol* 1996; **8**: 319-23.
9. Tremolada F, Casarin C, Tagger A, et al. Antibody to hepatitis C virus in post-transfusion hepatitis. *Ann Intern Med* 1991; **114**: 277-81.
10. Chiaramonte M, Stroffolini T, Caporaso N, et al. Hepatitis C infection in Italy: a multicenter epidemiological study. A report from the HCV study group of the Italian Association Study Liver (AISF). *Ital J Gastroenterol* 1991; **23**: 555-8.
11. Alter MJ. Epidemiology of Hepatitis C in the West. *Semin Liver Dis* 1995; **15**: 5-14.
12. Chiaramonte M, Stroffolini T, Lorenzoni U, et al. Risk factors in community-acquired chronic hepatitis C virus infection: a case-control study in Italy. *J Hepatol* 1996; **24**: 129-34.
13. Mele A, Saggiocca L, Manzillo G, et al. Risk factors for acute non-A, non-B hepatitis and their relationship to antibodies for hepatitis C virus: a case-control study. *Am J Public Hlth* 1994; **84**: 1640-3.
14. Mele A, Stroffolini T, Pasquini P. SEIEVA Integrated Epidemiological System for acute viral hepatitis in Italy. Report 1985-1994, 1996; **3**: 1-33.
15. Faustini A, Franco E, Saitto C, et al. Hepatitis A, B, C and D in a community in Italy of immigrants from NE Africa. *J Publ Hlth Med* 1994; **16**: 71-8.
16. Santantonio T, Lo Caputo S, Germinario C, et al. Prevalence of hepatitis virus infections in Albanian refugees. *Eur J Epidemiol* 1993; **9**: 537-40.

17. Sherlock S. Hepatitis B: the disease. *Vaccine* 1990; **8** Suppl: 6-9.
18. Bellentani S, Tiribelli C, Saccoccio G, et al. Prevalence of chronic liver disease in the general population of Northern Italy: the Dionysos Study. *Hepatology* 1994; **20**: 1442-9.
19. Guadagnino V, Stroffolini T, Rapicetta M, et al. Prevalence, risk factors, and genotype distribution of hepatitis C virus infection in the general population: a community-based survey in Southern Italy. *Hepatology* 1997; **26**: 1006-11.
20. Alter MJ. The detection, transmission, and outcome of hepatitis C virus infection. *Infect Ag Dis* 1993; **2**: 155-66.