
Prevalence and risk factors of HIV, hepatitis B and hepatitis C in a forensic population of rapists and child molesters

O. GIOTAKOS^{1*}, P. BOURTSOUKLI², T. PARASKEYOPOULOU²,
P. SPANDONI¹, S. STASINOS³, D. BOULOUGOURI³ AND E. SPIRAKOU³

¹ *Psychiatry Department and Research & Prevention Unit of the Tripolis' General Army Hospital, 22100 Tripolis, Greece*

² *Department of Blood Transfusion Station, General Hospital of Tripolis, 22100 Tripolis, Greece*

³ *Department of Internal Medicine, General Hospital of Tripolis, 22100 Tripolis, Greece*

(Accepted 24 December 2002)

SUMMARY

The aim of the present study was to assess the prevalence as well as the possible risk factors of HIV, hepatitis B and hepatitis C, in 194 male prisoners who had been convicted for rape ($n = 105$) or child molestation ($n = 89$). HBsAg, HBeAg, anti-HBc, anti-HBs, anti-HCV and anti-HIV-1/2 were tested for. The participants also completed a standard sociodemographic questionnaire, indicating possible risk factors, the Barratt Impulsiveness Scale, and the life-time history of aggression. Anti-HIV antibodies were not found in any of the prisoners. HBsAg was found in 25 (13%), anti-HBc in 94 (49%), anti-HBs in 40 (21%) and anti-HCV in 13 (6.5%) subjects. Logistic regression analysis showed that anti-HCV positivity was associated with intravenous drug use (OR 20.7, 95% CI 1.1–4.9, $P < 0.001$), while HBsAg positivity was associated separately with being foreign (OR 4.0, 95% CI 0.2–2.5, $P < 0.01$), as well as with impulsiveness score (OR 1.06, 95% CI 0.01–0.11, $P < 0.02$). The prevalence of HBV and HCV infection in this sex offender sample was highly increased in relation to the general population. Since it has been proved that sex offenders are a high-risk group for reoffending, monitoring their health is a necessary step towards prevention of sexually transmitted diseases being spread.

INTRODUCTION

Sexual abuse is a frequent and violent crime and it is the most underreported of all crimes [1]. Victims can include male and female adults and children. The victims may suffer from depression or post-traumatic stress disorder, even many years after the assault [1]. They are also at risk for acquisition of many sexually transmitted diseases, such as infections with herpes simplex virus, hepatitis B or C viruses, and HIV [2].

Evidence suggests that the prevalence of preexisting sexually transmitted diseases is high in victims of rape, but there is a substantial additional risk of acquiring such diseases as result of the assault [3].

It is widely known that sex offenders are characterized by high psychiatric comorbidity. A large proportion of them meet the criteria for a personality disorder, manifesting high levels of impulsiveness, aggression, risk-taking behaviours and drug abuse, while one fifth of them report a history of sexual abuse during childhood [4, 5]. In addition, both rapists and child molesters have a high risk of reoffending even many years after being discharged

* Author for correspondence: Dr O. Giotakos, 2 Erifilis str, 11634 Athens, Greece.

Table 1. Sociodemographic data and questionnaire scores in the whole sample, as well as in the subgroups with no infection, with past HBV infection, HBsAg positivity and anti-HCV positivity

	Whole sample (<i>n</i> = 194) Mean ± s.d.	No infection (<i>n</i> = 95) Mean ± s.d.	Past HBV infection (<i>n</i> = 69) Mean ± s.d.	HBsAg positive (<i>n</i> = 25) Mean ± s.d.	Anti-HCV positive (<i>n</i> = 13) Mean ± s.d.
Age	35.2 ± 11.2	34.3 ± 10.2	37.0 ± 12.0	31.8 ± 8.5	35.0 ± 10.3
Education (years)	7.8 ± 4.0	8.0 ± 3.5	8.0 ± 4.6	6.0 ± 4.6	6.1 ± 4.7
Sentence (years)	9.0 ± 5.2	8.2 ± 4.4	9.6 ± 6.3	9.7 ± 4.6	11.5 ± 6.9
Sexual partners	34.9 ± 34.1	29.1 ± 31.8	39.7 ± 36.0	34.1 ± 30.9	65.0 ± 34.3
Aggression (LTHA)	17.0 ± 4.6	15.0 ± 4.2	18.9 ± 4.1	18.5 ± 5.0	19.0 ± 4.7
Impulsiveness (BIS)	84.0 ± 14.5	78.5 ± 13.2	87.6 ± 15.0	91.2 ± 9.3	94.0 ± 12.3

from prison [1, 6] and thus being a high risk group for transmitting sexually transmitted diseases to their victims.

The aim of the present study was to assess the prevalence of HIV, HBV and HCV infections in a forensic population of rapists and child molesters, and to investigate for possible risk factors of these infections.

METHODS

One hundred and ninety-four males (mean age 35.2 years, range 19–63 years), convicted for rape (*n* = 105) or child molestation (*n* = 89), participated in this study. They were all held in the only prison for sexual offenders in Greece (Tripolis prison) during the years 2000 and 2001. Their mean education was 7.8 (s.d. 4.0) years, and their mean sentence 9.0 (s.d. 5.2) years. Eighty-two (42%) subjects were foreigners, and most of them (93%) were immigrants from Albania living in Greece for a period of 1 to 5 years. All participants signed an informed consent form to be interviewed and to submit a blood sample for HIV, HBV and HCV testing during the first 2 weeks of their admission. Inmates who refused to participate, as well as inmates with early release and language problems were excluded from the study.

The participants completed a standard questionnaire seeking data on sociodemographic variables, penal status, number of life-time sexual partners, history of bisexual behaviour, and history of intravenous drug use (IVDU). They also were assessed on the Barratt Impulsiveness Scale (BIS) [7] consisting of 30 four-grade answer scale questions. It contains three subscales measuring 'motor' (act without thinking), 'cognitive' (making-up one's mind quickly), and 'no-plan' (impulsiveness). The Life-Time History of

Aggression (LTHA) [8] consisting of 23 five-grade answer scale questions that concern life-time aggressive or violence acts was also completed. The questionnaires were administered to all subjects by the same clinician (O. G.).

Blood was prepared for examination and stored in a –70 °C freezer according to standard procedures. HIV-1/2 antibody testing was carried out using third-generation anti-HIV assays combined with p24 antigen test (Vidas HIV DUO, Bio Merieux.sa, France) [9]. The tests used to detect HBV infection were enzyme-linked immunosorbent assays (ELISA) for anti-HBc, HBeAg, and anti-HBe, and radio-immunoassay for HBsAg (Abbott, Germany). A third-generation ELISA also was used to detect antibodies to HCV (Ortho-Clinical Diagnostics, USA). We did not use extra confirmation procedures for verification of the anti-HCV results.

The prevalence of hepatitis markers was calculated. For further investigation of possible risk factors, the variables age, education, total number of sexual partners, history of bisexual behaviour, aggression, impulsiveness, sentence, intravenous drug use, foreigner, and the type of conviction were investigated separately using multiple logistic regression analysis.

RESULTS

All findings concerning the hepatitis markers, as well as the sociodemographic and the psychometric measures are shown in Tables 1 and 2. Anti-HIV antibodies were not found in any of the prisoners. HBsAg was found in 25 (13%), anti-HBc in 94 (49%), anti-HBs antibody in 40 (21%) and anti-HCV in 13 (6.5%) subjects. The anti-HCV antibody was found in 7 subjects with past HBV infection and in 2 HBsAg carriers. Anti-HBs antibody was found in 11

Table 2. *Additional risk factors and prevalence of HBV and HCV infection*

	Whole sample (<i>n</i> = 194) <i>n</i>	No infection (<i>n</i> = 95) <i>n</i> (%)	Past HBV infection (<i>n</i> = 69) <i>n</i> (%)	HBsAg positive (<i>n</i> = 25) <i>n</i> (%)	Anti-HCV positive (<i>n</i> = 13) <i>n</i> (%)
Foreigner	82	30 (37)	31 (38)	18 (22)	4 (5)
Rapists	105	48 (46)	42 (40)	13 (12)	10 (10)
Child	89	47 (53)	27 (30)	12 (13)	3 (3)
Molesters	19	2 (11)	13 (68)	3 (16)	8 (42)
IVDU					
Bisexual	71	27 (68)	28 (39)	13 (18)	5 (7)

subjects with history of immunization, in 28 subjects with past HBV infection, in 1 HBsAg carrier and in 3 anti-HCV positive subjects.

Logistic regression analysis showed that anti-HCV positivity was associated with intravenous drug use (OR 20.7, 95% CI 1.1–4.9, $P < 0.001$), while HBsAg positivity was associated separately with being foreign (OR 4.0, 95% CI 0.2–2.5, $P < 0.01$), as well as with the score of the impulsiveness (OR 1.06, 95% CI 0.01–0.11, $P < 0.02$).

DISCUSSION

In contrast to previous findings of studies in prisoners [10, 11], none of the participants in this study was found to be infected by HIV, although a high proportion had had a history of bisexual activity (37%) and intravenous drug use (10%). However, we found that 13% were HBsAg carriers, 48% had a past HBV infection and 6.5% were anti-HCV positive. The HBsAg positivity was found to be significantly associated with foreign origin, a finding which is in agreement with previous studies that showed increased prevalence of HBV infection in immigrants from Albania [12]. The reasons that Albanian immigrants are over-represented in this prison's population are probably similar to the reasons why many socially excluded groups appear to be more vulnerable when facing criminal justice procedures. These reasons include poverty, low educational level, poor social skills and poor use of the spoken language, which is a disadvantage when standing in front of a court of law. As far as the Greek members of the sample are concerned, 6.25% were found to be HBsAg carriers, which is very much higher than the prevalence in the general Greek population (estimated between 0.8 and 2%) [13–15].

As expected, anti-HCV positivity was found to be associated with intravenous drug use. Nineteen subjects (10%) of the whole sex offender sample were intravenous drug users and eight of them were anti-HCV positive. We consider these findings to confirm the results of earlier studies on the prevalence of anti-HCV in intravenous drug users [16, 17].

As far as comorbid psychopathology is concerned, life-time aggression was not associated in our study with either past or present infections. On the contrary, impulsiveness was found to be an additional risk factor for HBV infection. As a further hypothesis, we suggest that impulsiveness is an important risk factor for spreading HBV to others, since risk-taking behaviours, such as novelty and sensation-seeking in sexual behaviour, constitute parts of this personality dimension. It is widely known that sex offenders are characterized by high psychiatric comorbidity [4, 5]. They show also a tendency for reoffending throughout their lifetime, quite often targeting several victims, even many years after they have been discharged from prison [1, 6]. Thus, the epidemic of hepatitis B and C among sex offenders identified by this study constitutes a major public health problem. All the above reveal the necessity of close systematic monitoring of the mental and physical health of the sex offenders, through planned integrated prevention and rehabilitation programmes.

REFERENCES

1. Zonana H, Abel G, Bradford J, Hoge S, Metzner J, eds. *Dangerous sex offenders: a task force of the American Psychiatric Association*, Washington DC, APA, 1999: 1–10, 129–54.
2. Glaser JB, Hammerschlag MR, McCormack WM. Epidemiology of sexually transmitted diseases in rape victims. *Rev Infect Dis* 1989; **11**: 246–54.

3. Jenny C, Hooton TM, Bowers A, et al. Sexually transmitted diseases in victims of rape. *N Engl J Med* 1999; **322**: 713–6.
4. Raymond NC, Coleman E, Ohlerking MA, Christenson GA, Miner M. Psychiatric comorbidity in pedophilic sex offenders. *Am J Psychiatry* 1999; **156**: 786–8.
5. Valliant PM, Bergeron T. Personality and criminal profile of adolescent sexual offenders, general offenders in comparison to nonoffenders. *Psychol Report* 1997; **81**: 483–9.
6. Prentky RA, Lee AFS, Knight RA. Recidivism rates among child molesters and rapists: a methodological analysis. *Law Hum Behav* 1997; **21**: 635–59.
7. Barratt ES. Impulsiveness subtraits: arousal and information processing. In: Spence JT, Izard CE, eds. *Motivation, emotion and personality*. New York: Elsevier Science Publishers, 1985: 137–46.
8. Brown G, Goodwin F, Ballenger J, Gover P, Major T. Aggression in humans correlates with cerebrospinal fluid amine metabolites. *Psychiatr Res* 1979; **1**: 131–9.
9. Laperche S, Maniez-Montreuil M, Courouze MA. Screening tests combined with p24 antigen and anti-HIV antibodies in early detection of HIV-1. *Transfus Clin Biol* 2000; **23** (Suppl 1): 18–24.
10. Pallas J, Farinas-Alvarez C, Prieto D, Llorca J, Delgado-Rodriguez M. Risk factors for mono-infections and coinfections with HIV, hepatitis B and hepatitis C viruses in Northern Spanish prisoners. *Epidemiol Infect* 1999; **123**: 95–102.
11. Curtis SP, Edwards A. HIV in UK prisons: a review of seroprevalence, transmission and patterns of risk. *Int J STD AIDS* 1995; **6**: 387–91.
12. Santantonio T, Lo Caputo S, Germinario S, Greco D, Laddago V. Prevalence of hepatitis virus infections in Albanian refugees. *Eur J Epidemiol* 1993; **9**: 537–40.
13. Stamouli M, Gizaris V, Totos G, Papaevafelou G. Decline of hepatitis B in Greece. *Eur J Epidemiol* 1999; **15**: 447–9.
14. Koulentaki M, Spanoudakis S, Kantidaki E, Drandakis P, Tsagarakis N, Biziagos N. Prevalence of hepatitis B and C markers in volunteer blood donors in Crete. A 5 year study. *J Viral Hepat* 1999; **6**: 243–8.
15. Goritsas C, Petrou I, Agaliotis S, Spinthaki R, Mimidis K, Velissaris D. HCV infection in the general population of a Greek island: prevalence and risk factors. *Hepatogastroenterol* 2000; **47**: 782–5.
16. Struve J, Kull K, Stendahl P, Scalia Tomba G, Giesecke J, Weiland O. Prevalence of hepatitis B virus markers among intravenous drug abusers in Stockholm: impact of heterosexual transmission. *Scand J Infect Dis* 1993; **25**: 8–13.
17. Malliori M, Sypsa V, Psychogiou M, et al. A survey of bloodborne viruses and associated risk behaviours in Greek prisons. *Addiction* 1998; **93**: 243–51.