

Hepatitis B markers in West Yorkshire firemen

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SUMMARY

Firemen have been considered at occupational risk of hepatitis (HBV) infection, but proof is lacking. The aim of this study was to assess the degree of risk by determining the prevalence of serological markers of past infection with HBV in members of the West Yorkshire Fire Service. Sera from 173 firemen, 9.3% of the brigade, were tested for antibodies to HBV surface antigen and to core antigen. Those containing anti-HBs ≥ 10 IU/L or anti-core antibody, were also tested for antibody to HBe antigen. The presence of more than one marker was used to define past infection. One sample satisfied this criterion, giving a prevalence rate of 0.6%. This compares with a rate of 1% in London blood donors. We conclude that the group shows no evidence of having been at increased risk of HBV infection. A comprehensive vaccination policy for firemen might be questionable.

INTRODUCTION

Firemen have been considered at increased risk of hepatitis B infection (HBV) through contact with blood and body fluids during rescue work, but proof is lacking (1). The West Yorkshire Fire Service were concerned about the degree of risk, and whether it might merit routine vaccination of staff. The aim of this survey was to determine the prevalence of serological markers of past infection with hepatitis B in members of that service.

SUBJECTS AND METHODS

The West Yorkshire Fire Service serves a large population in a mixed urban and rural area. The number and type of incident attended is similar to other large brigades, (G. Karran, W. Yorks. Fire Service, personal communication). All whole-time operational personnel in the West Yorkshire Fire Service (1865) were invited to participate in this survey. Volunteers completed an anonymous questionnaire and provided a blood sample, both identified by a survey number only. Firemen previously vaccinated against HBV were excluded.

Sera were tested for antibody to HBV surface antigen (anti-HBs) and HBV core antigen (anti-HBc). Reagents used were Ausab RIA, and Corzyme EIA (Abbott Diagnostic Division). Sera positive for anti-HBs were retested using Monolisa anti-HBs (Diagnostic Pasteur). Those containing ≥ 10 IU/L anti-HBs, or anti-HBc, were tested for antibody to HBe antigen (anti-HBe) using HBe EIA (Abbott Diagnostic Division). Sera were not tested for hepatitis B surface antigen for ethical reasons.

One hundred and seventy-three firemen (9.0% of the total force) participated. Their mean age was 37.2 years (range 20 to 55). Mean length of service was 13.4 years (range 1 to 25); 151 (87%) had worked for more than 5 years in the service. One hundred and five (60.7%) had been contaminated on more than one occasion by blood or body fluids during rescue work, 56 (32%) on more than five occasions. Seventeen (9.8%) gave a history of previous jaundice, and 17 (9.8%) of previous household contact with jaundice. Twenty (11.6%) had lived for more than one month in a high risk area of the world (1), 3 (1.7%) had previously worked in high risk occupations, 26 (15%) were tattooed, 17 (9.8%) had had a blood transfusion (3 outside the U.K.), and 1 (0.6%) had a previous homosexual relationship. Five (2.9%) were of non-U.K. origin.

Firemen frequently sustain cuts to their hands during rescue work, but no data on contamination of broken skin was sought, as we believed accurate recall of this would be unlikely.

RESULTS

Samples containing < 10 IU/L anti-HBs were considered negative. Five samples contained ≥ 10 IU/L anti-HBs; one also contained anti-HBc and anti-HBe. One specimen was weakly positive for anti-HBc alone. Results, with

Table 1. *Pattern of antibodies to HBV with risk factors for HBV infection in the firemen*

Case	Anti-HBs IU/L		anti-HBc	anti-HBe	No. of times contaminated at work	Other risk factors
	Ausab	Monolisa				
1	≥ 50	≥ 50	+	+	0	0
2	≥ 50	< 10	-	-	1-2	previous jaundice
3	$\geq 10 < 50$	< 10	-	-	≥ 5	0
4	$\geq 10 < 50$	< 10	-	-	0	0
5	$\geq 10 < 50$	$\geq 10 < 50$	-	-	≥ 5	Household contact
6	-	-	+ (weak)	-	≥ 5	Tattoos, high risk areas, previous jaundice, household contact

risk factors, are shown in Table 1. The sample containing three markers of HBV shows definite evidence of past infection, (case 1), whereas those containing anti-HBs or anti-HBc alone, (cases 2-6), show more doubtful past infection.

DISCUSSION

Tedder and his colleagues (2) warned that the demonstration of a single low-titre antibody marker should not be assumed to indicate past infection with HBV. Using the presence of more than one marker to define past infection, the prevalence in the firemen was 0.6%. Using the same criterion, figures derived from previous studies give a prevalence of 1% in London blood donors (2), and 1.3% in Scottish donors (3). No data is available on the prevalence of antibody markers for HBV in the general population of West Yorkshire, but the cumulative incidence of HBs antigenaemia in new donors attending the Regional Blood Transfusion Service over a 3-year period was 0.04% (A. Robinson, Yorkshire Regional BTS, unpublished figures), and antibody prevalence would be significantly greater than this. The prevalence in police officers has been shown to be 1.1% (4), whereas in workers in hospitals for the mentally handicapped it has ranged between 5.2% (5) and 15% (6).

Immunisation of high risk personnel is increasingly feasible. Although this survey was small and involved volunteers only, we conclude that these firemen, 60.7% of whom had had occupational exposure to body fluids, showed no evidence of having been at increased risk of HBV infection. Before any national policy were implemented, further investigation would be desirable; comprehensive vaccination may not be justifiable.

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