

Hepatitis in clinical laboratories 1973-74

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SYNOPSIS The survey of laboratories in 1970-72 was continued by a questionnaire to members of the Association of Clinical Pathologists covering the next two years. Hepatitis B accounted for 14 of the 32 cases reported from 28 laboratories. A moderate excess of laboratories reporting hepatitis tested specimens from transplant units. The average attack rate for staff of all types was 143 per 100 000 with higher rates for science-biochemists (308), medical morbid anatomists (302), and haematology technicians (292). No case was fatal and only seven required hospital admission. The findings confirm the need for continued vigilance and precautions but do not justify alarm.

The three-year survey previously reported (Grist, 1975) was continued in simplified form by means of a questionnaire sent to ACP members in January 1975. The forms were not precoded since the numbers involved did not justify punch-card analysis. The questions corresponded to those in the first survey but omitted (a) those concerning different

ways of handling 'hepatitis high-risk' specimens, since the numbers in particular groups were too small to reveal significant differences (Grist, 1975; table II), and (b) specific questions about suspected sources of infection (Grist, 1975; tables VII and VIII) since these also had proved relatively uninformative. The numbers of staff involved were enumerated as at January 1973, 1974, and 1975, differentiating full-time from part-time workers, and the population at

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Employment Category and Discipline	Hepatitis Cases Reported			Average No. at Risk ¹	Average Annual Attack Rate per 100 000 ²
	1973	1974	Total		
Medical					
Morbid anatomy	2	0	2	663	302
Haematology	0	0	0	640	0
Biochemistry	0	0	0	217	0
Microbiology	0	0	0	471	0
Immunology	0	0	0	38	0
Other	0	0	0	48	0
Science					
Morbid anatomy	1	0	1	41	(> 2000)
Haematology	0	0	0	119	0
Biochemistry	1	1	2	650	308
Microbiology	0	0	0	179	0
Immunology	0	0	0	24	0
Other	0	0	0	52	0
Technician					
Morbid anatomy	0	1	1	1 747	57
Haematology	5	7	12	4 104	292
Biochemistry	3	1	4	2 931	136
Microbiology	3	2	5	3 498	143
Immunology	0	0	0	131	0
Other	0	0	0	837	0
Porters, assistants, etc	0	1	1	1 279	78
Domestics	1	0	1	1 081	93
Secretaries, office staff	0	1	1	2 400	42
Others	0	2	2	1 090	183
Total	16	16	32	22 243	143

Table I *Hepatitis cases and attack rates in different groups*

¹Person-years = Σ (full-time + part-time/2, as at 1 January 1973, 1974, 1975) \times 2/3.

²Total cases \div average number at risk \times 100 000.

risk during the two years 1973-74 was calculated as two-thirds of the sums of the numbers of full-time and half the part-time workers on these three occasions (table I, footnote). Classification difficulties encountered during the later period of the first survey were reduced by differentiating immunology as a separate discipline.

Results

Replies were received from 245 laboratories, in which 32 cases of hepatitis were reported (table I), a similar number per annum to that of the first survey. The average annual attack rate of 143 per 100 000 is somewhat higher than the 111 calculated for the first survey without correction for part-time workers in 1970-72, probably not representing a significant increase. Attack rates more than 50% above average were found in the following groups: science-morbid anatomy (not significant, a single case among 41), science-biochemistry (high also in the first survey), medical-morbid anatomy (2 cases in same laboratory, only 1 positive in the test for hepatitis B antigen (HB_sAg)), and technician-haematology. This last group gave a high rate in 1970-72 also; 3 occurred in space-time clusters (table IV), 5 were HB_sAg-positive, and 7 of the 11 were female.

Tests for HB_sAg had been carried out in 84% of cases (table II) compared with 78% in 1970-72 and, as before, there was no significant difference in severity between hepatitis B and other cases as reflected in hospital admission rates or deaths (nil). The age distribution resembled that of 1970-72 but the sex ratio changed to a female excess (table II).

Brief details of the 14 hepatitis B cases are given in table III. Only one accident, a needle-prick, was

Employment Discipline and Category	Sex, Age, and other Information	
Medical		
Morbid anatomy	M 27	Same laboratory and year as HB _s Ag-neg. hepatitis in medical morbid anatomist
Science		
Morbid anatomy	F 28 ¹	
Biochemistry	M 26	Wife had hepatitis first
Technician		
Haematology	F 20	
"	F 28	Same laboratory and year
"	F 38	
"	F 17	
"	F 17	
"	M ? ²	Blood bank worker
"	F 31	
Biochemistry	F 18 ¹	
Microbiology	F 22	
"	M < 20	
Assistant		
Biochemistry	F ? ²	
Other		
Specimen collector	F 38	Pricked finger

Table III Details of 14 hepatitis B cases

¹Same laboratory, different years.

²Same laboratory and year as two other asymptomatic HB_sAg positives not included in analysis (see table IV).

mentioned as the probable cause of infection. Hepatitis in the science-biochemist was thought to have been acquired from his wife rather than in the laboratory. Half of these hepatitis B cases occurred in the four space-time clusters shown in table IV, of

<i>Laboratory A (Morbid Anatomy)</i>		
1973	Medical morbid anatomist	hepatitis B
1973	Medical morbid anatomist	HB _s Ag negative hepatitis
<i>Laboratory B (Microbiology and Immunology)</i>		
1973	Science morbid anatomist	hepatitis B
1974	Technician biochemist	hepatitis B
<i>Laboratory C (General: 4 Disciplines)</i>		
1973	Technician haematologist	hepatitis B
1973	Technician haematologist	hepatitis B
<i>Laboratory D (General: 4 Disciplines)</i>		
1974	Aide-biochemistry	hepatitis B
1974	Technician haematologist	hepatitis B
1974	Medical biochemist	Carrier ¹
1974	Science endocrinologist	Carrier ¹

Table IV Clusters of hepatitis cases

¹Symptomless; detected by screen tests for HB_sAg (excluded from tables I-III).

which those in laboratories A and B are of doubtful significance (only one case demonstrably hepatitis B in laboratory A; cases in different years in laboratory B). Clusters suggested outbreaks in laboratory C (two haematology technicians) and laboratory D where testing revealed two additional symptomless carriers.

The work characteristics of laboratories reporting hepatitis are summarized in table V. As in 1970-72,

	HB _s Ag Test Results			Total
	Posi- tive	Nega- tive	UT/ NK ¹	
Sex				
Male	4	7	4	15
Female	10	6	1	17
Age (yr)				
< 20	3	2	0	5
- 30	6	7	2	15
- 40	3	2	1	6
- 50	0	0	0	0
> 50	0	2	2	4
NK	2	0	0	2
Illness				
Jaundiced	11	13	5	29
In hospital	4	3	0	7
Fatal	0	0	0	0
Total	14	13	5	32

Table II Sex, age, and severity of hepatitis cases

¹Untested or not known.

Sources of Specimens and Type of Work	1973				1974					
	14 Laboratories with Hepatitis ¹				15 Laboratories with Hepatitis ¹					
	HB _e Ag Pos. = 5 Labs ²	HB _e Ag Neg. = 6 Labs ²	UK UT ³ = 4 Labs	All Types Total = 14 Labs ³	231 Labs without Hepatitis	HB _e Ag Pos. = 7 Labs	HB _e Ag Neg. = 7 Labs	UK UT ³ = 1 Lab	All Types Total = 15 Labs	230 Labs without Hepatitis
Haemodialysis unit specimens										
(a) tested	2	1	0	3 (21%)	70 (30%)	3	3	1	7 (47%)	68 (30%)
(b) not tested	3	5	4	11	157	4	4	0	88	159
(c) not known	0	0	0	0	4	0	0	0	0	3
Transplant unit specimens										
(a) tested	3	1	0	4 (29%)	44 (19%)	3	2	1	6 (40%)	43 (19%)
(b) not tested	2	5	4	10	185	4	5	0	9	186
(c) not known	0	0	0	0	2	0	0	0	0	1
Haemophilia centre specimens										
(a) tested	3	0	0	3 (21%)	55 (24%)	3	3	1	7 (47%)	54 (23%)
(b) not tested	2	6	4	11	174	4	3	0	8	175
(c) not known	0	0	0	0	2	0	0	0	0	1
Drug addict centre specimens										
(a) tested	2	3	1	6 (43%)	33 (14%)	2	1	1	4 (27%)	38 (17%)
(b) not tested	3	3	3	8	196	5	6	0	11	191
(c) not known	0	0	0	0	2	0	0	0	0	1
HB_eAg tests										
(a) done	2	0	0	2 (14%)	50 (22%)	4	1	1	6 (40%)	55 (24%)
(b) not done	3	6	4	12	179	3	6	0	9	174
(c) not known	0	0	0	0	2	0	0	0	0	1

Table V Numbers of laboratories with various work characteristics and with or without hepatitis cases

¹One laboratory with cases in both 1973 and 1974.

²One laboratory with both HB_eAg positive and HB_eAg negative cases.

³Untested or not reported.

an excess of laboratories reporting hepatitis tested specimens from transplant units. There was no such excess for both years in the other categories except in relation to testing specimens from drug addiction centres, an operation not associated with increased risk in the first survey.

Discussion

This survey shares the limitations of its predecessor (Grist, 1975). In general, its findings support those of the first survey. Low attack rates were found in both surveys among domestics, office staff, porters, and assistants, the only hepatitis B cases among these being two associated respectively with a finger prick and with other hepatitis B cases in the same laboratory (tables III and IV). Probably most of the few cases in these groups represent the normal background of hepatitis in the general population rather than being acquired in the laboratory environment. The attack rate in biochemistry technicians has fallen since the previous survey, suggesting increased safety standards in this discipline. In contrast, the attack rate among haematology technicians has more than doubled since 1970-72 to reach about twice the average rate for all staff in 1973-74.

These findings agree with those of a recent survey of hospital staff in Edinburgh for antibody to

HB_eAg (anti-HBs) which showed that workers in haematology had a higher antibody prevalence rate than those in bacteriology, blood transfusion, clinical chemistry, and pathology (Burrell *et al*, personal communication). The findings also support those of serological surveys of hospital staff in the USA (Pattison *et al*, 1975) and Canada (Leers and Kouroupis, 1975) which showed that the risk of infection with hepatitis B was highest in those who handled blood and blood products, particularly in the laboratory disciplines of clinical chemistry and haematology. Hepatitis viruses may occur less frequently in microbiology specimens than in those reaching the biochemists and haematologists, but in any case microbiologists are inevitably more aware of infection and must adopt techniques which control this. Both clinical hepatitis and the prevalence of anti-HBs varied in proportion to the handling of blood from renal dialysis patients in an American hospital involved in an outbreak where the incidence of hepatitis in laboratory staff was much higher (2.6 per 1000 person-months = average annual attack rate of 3120 per 100 000) than in the present survey of British laboratories (Williams *et al*, 1974).

Although the findings confirm the continuance of some occupational risk to certain groups, it is encouraging that the highest attack rates for particular

occupational groups in the two surveys were less than three times the average rate. Also, while it is known that hepatitis can be severe or fatal, over the five years of the surveys none of the 73 cases was fatal and only a quarter required admission to hospital (29% for hepatitis B, 21% for HB_eAg-negative hepatitis). Thus the risk of hepatitis to laboratory staff falls into place among the other occupational risks which require surveillance and precautions but do not justify exaggerated alarm.

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