SHORT REPORT

Out of hours management of occupational exposures to blood and body fluids in healthcare staff

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Aims: To assess and compare the out of hours and in hours management of occupational blood and body fluid exposures in a London teaching hospital.

Methods: The occupational health and accident and emergency records of individuals presenting with occupational body fluid exposures over a six month period at a London teaching hospital were analysed retrospectively. Main outcome measures were the completeness of records, and the appropriate management of body fluid exposures using the Department of Health guidelines as the gold standard.

Results: A total of 177 body fluid exposures were reported; 109 (61.58%) were initially assessed in the occupational health department, and 68 (38.42%) in the accident and emergency department. Of those originally assessed in the accident and emergency department, only 21 (30.88%) attended the occupational health department for follow up. Occupational health staff were more consistent in assessing and managing exposures, and in a higher proportion of cases gave more appropriate advice on post-exposure prophylaxis (PEP) against hepatitis B and HIV. Of the 11 individuals prescribed HIV PEP (all by accident and emergency staff), only three subsequently attended occupational health for follow up. In all three cases therapy was discontinued, as the source was HIV negative or the exposure low risk.

Conclusions: Out of hours management of occupational body fluid exposures, particularly the prescribing of HIV PEP, was inconsistent with in hours practice. This may also be the case in other large inner city hospitals offering a similar service.

Occupational exposure to blood or body fluids (hereafter referred to as body fluid exposures) in healthcare facilities constitutes a small, but significant risk of transmission of blood borne pathogens. The greatest cross infection hazard is presented by HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV),^{1,2} and the average risk of infection following a percutaneous exposure to these viruses is estimated as 0.3%,³ 1.8%,⁴ and in excess of 30%,⁵ respectively.

Strict infection control, universal precautions, immunisation against HBV, and prompt management of exposures can reduce the risk of occupational acquisition of these infections. Accordingly, healthcare facilities should have in place detailed policies on the prevention of spread of blood borne viruses (BBVs), and procedures for managing staff who have been exposed.^{1,2,6}

Procedures should ensure that a designated department has overall responsibility for managing exposures, and that staff have 24 hour access to advice and management, including the provision of post-exposure prophylaxis (PEP).^{1,2,7} In most cases, occupational health departments (OHDs) have overall

responsibility, and accident and emergency departments (A&E) provide out of hours cover.

The initial risk assessment following a body fluid exposure should include the time, nature, and circumstances of the exposure, and information on the source patient and the exposed member of staff (recipient).^{1,2,6-8} A blood sample should be taken from the recipient for storage and to check HBV immunity. HBV or HIV PEP should be provided according to relevant guidelines.^{1,2,6,7}

Guy's and St Thomas' Hospitals NHS Trust is an inner city Trust with 6700 employees and 4675 medical, dental, and nursing students. The infection control policy for the management of body fluid exposures has been in place since 1997, and is based on Department of Health (DOH) guidelines.^{1,2} Following any occupational exposure, staff are instructed to report the incident to the OHD Monday to Friday from 0800 to 1700, and to A&E at other times and bank holidays. Staff seen in A&E are told to attend the OHD for follow up.

Occupational health (OH) sisters and junior A&E doctors manage exposures in the OHD and A&E respectively. Advice is available from occupational physicians for the former, and from on call virologists for the latter. Risk assessment forms are completed for all exposures, and although the departments use slightly different forms, the information required to be recorded is the same.

To assess the effectiveness of procedures for the management of body fluid exposures, a retrospective survey was undertaken.

METHODS

Investigators from the OHD retrospectively analysed the records of individuals attending OHD or A&E following body fluid exposures over a six month period. Information analysed included details of the risk assessment and management of the exposure.

Using the Trust Infection Control Policy and DOH guidance^{1,2} as a gold standard, the proportion of adequately assessed and managed exposures was determined for each department. Data collected were then compared by calculating 95% confidence intervals for the differences between the two departments. When any of the expected values were less than 5 the probability was calculated using Fisher's exact test.

RESULTS

General information

Of the 177 body fluid exposures reported, 109 (61.58%) were originally assessed in the OHD and 68 (38.42%) in A&E. Only 21 (30.88%) individuals attended the OHD following initial

Abbreviations: A&E, accident and emergency; BBV, blood borne virus; DOH, Department of Health; HBV, hepatitis B virus; HCV, hepatitis C virus; OH, occupational health; OHD, occupational health department; PEP, post-exposure prophylaxis

Table 1 Comparison of assessment and management of body fluid exposures between the OHD and A&E

	OHD (%)	A&E (%)	Difference (%)	95% CI of difference
Adequacy of risk assessment records				
Date of incident	97 (88.99)	57 (83.82)	5.17	-5.37 to 15.71
Time of incident	84 (77.06)	49 (72.06)	5.00	-8.27 to 18.27
Circumstances of exposure	89 (81.65)	33 (48.53)	33.12	19.19 to 47.05
Depth of injury	78 (71.56)	28 (41.18)	30.38	15.94 to 44.82
Nature of instrument	97 (88.99)	46 (67.65)	21.34	8.76 to 33.92
Needle in artery or vein	74 (82.22)	43 (72.88)	9.34	-4.48 to 23.16
Source risk assessment recorded	68 (75.56)	53 (89.83)	-14.27	-26.03 to -2.51
Management relating to HBV				
Enquiry of recipient's HBV immunity	100 (91.74)	58 (85.29)	6.45	-3.43 to 16.33
Appropriate recipient blood tests*	109 (99.08)	59 (86.76)	12.32	3.79 to 20.21
Appropriate HBV PEP*	97 (88.99)	45 (66.18)	22.81	10.12 to 35.50
Frequency of source patient testing				
HBV	41 (75.93)	3 (7.5)	68.43	54.41 to 82.45
HCV	43 (79.63)	3 (7.5)	72.13	58.64 to 85.62
HIV	5 (4.17)	2 (5.51)	-1.34	p>0.05 (Fisher's exact)

*As determined by DOH guidelines.

assessment in A&E. A total of 33.90% of individuals presented for assessment within an hour of their exposure (28.44% and 42.65% in OHD and A&E respectively).

The source patient was known in 149 (84.18%) cases, and source blood was available for testing in 94 (63.09%) cases. Eighteen (12.08%) source patients were considered by OH or A&E staff to have risk factors for at least one BBV, and eight (5.37%) were known to be positive for one or more BBV. Risk factors were not recorded in 28 (18.79%) cases.

Source patient testing revealed two previously unknown HCV positive sources, but no new HIV or HBV positive sources. Results were not documented in 12 cases.

Risk assessment and management

Overall, the OHD was more consistent at assessing and managing exposures (table 1), recording risk assessments, managing exposures in relation to HBV, and organising source patient testing for HBV and HCV more comprehensively. However, A&E staff were better than OH staff at recording risk factors in the source patient. Both departments arranged source patient HIV tests infrequently.

HIV post-exposure prophylaxis

All 11 (6.21%) individuals prescribed HIV PEP had their therapy initiated in A&E. The difference in appropriate prescribing of HIV PEP between the two departments was highly significant ($p < 0.0001$, Fisher's exact test).

Table 2 illustrates the risk assessments recorded for cases considered by OHD or A&E staff to have risk factors for one or more BBV, and cases where HIV PEP was prescribed. Risk assessments were complete in 9/15 cases in the OHD but none of the cases in A&E. Only three of the individuals prescribed HIV PEP subsequently attended the OHD for follow up. HIV PEP was discontinued in these cases, as the source was HIV negative or the exposure low risk.

DISCUSSION

Main findings

The most important finding in this study was the inappropriate prescribing of HIV PEP in A&E. This occurred in the context of incomplete risk assessments, and in most cases was not indicated. This may be attributable to inexperience and inadequate training of A&E staff. As the data on the prophylactic benefit of HIV PEP and the long term toxicity in non-infected individuals is limited,⁹ the inappropriate prescription of these drugs raises serious concerns.

Another important finding was that 47 (69.12%) individuals failed to attend the OHD following initial management in

A&E. This could be because of a misconception that the exposure has been adequately managed. Alternatively, employees may consider follow up too time consuming.¹⁰

Risk assessment and management

Overall, OH staff were more consistent in assessing and managing exposures. This is not surprising; the concept of risk assessment is fundamental to OH practice, but may be alien to junior medical staff in A&E. OH staff also have more experience in managing body fluid exposures, and have more time to contact the source patient's medical team for information or to organise source patient testing. A&E staff were better at recording source risk factors, possibly because of a perception that this is the most important aspect of the risk assessment.

Source patient HIV tests were arranged infrequently by both OH and A&E staff; either reflecting ambiguity in guidelines,² or a reluctance to arrange HIV tests. New DOH guidance, which recommends universal HIV testing in source patients, should improve consistency.¹¹

Documentation of source patient test results was incomplete in both departments. Importantly, results of four high risk sources were not recorded (two in each department).

Solutions

This study shows a need to improve the management of out of hours body fluid exposures in such circumstances as these. In addition to increasing staff awareness of risks, policies, and procedures, improved collaboration between OH and A&E is essential. Possibilities include regular OH participation in training of A&E staff (instead of just a department of infection), OH involvement in the development of A&E management algorithms, and better communication in relation to staff follow up. A more efficient solution may be the provision of an out of hours OH telephone advice service. This would enable staff to access advice immediately, allowing confidential discussion with experienced occupational physicians. It would also preserve the confidentiality of employees whose clinical records may become accessible in A&E.

The cost effectiveness of introducing such a service would need to be assessed, but experience from the Royal Free Hospital¹² and United Bristol Health Care Trust suggests that this is an effective way of managing exposures out of hours. Over one year, the OHD at Bristol (a Trust with 5500 staff) responded to 147 out of hours calls and HIV PEP was prescribed in three cases (Dr Kit Harling, personal communication).

Table 2 Cases considered by OH or A&E staff to have risk factors for blood borne viruses, and those prescribed HIV post-exposure prophylaxis

Dept	Reporting time	Circumstance of exposure	Indicators of blood transfer				Source risks	HIV PEP	HIV test
			Deep injury	Hollow bore sharp	Sharp in artery or vein	Visible blood			
1. OHD	<1 hour	Recorded	No	No	No	No	Tuberculosis	No	No blood available
2. OHD	13–24 hours	Recorded	No	No	No	No	Known HCV+	No	No
3. OHD	1 day	Recorded	No	Yes	Yes	Yes	Haemodialysis	No	No
4. OHD	31 days	Recorded	Possible blood splash to non-intact skin				Known HBV+	No	No
5. OHD	13–24 hours	Recorded	Patient scratch				Known HBV+	No	No
6. OHD	1 day	Recorded	Mucocutaneous exposure to non-blood stained saliva				Homosexual relationship	No	No blood available
7. OHD	2 days	Recorded	Exposure of non-intact skin to non-blood stained saliva				Known HCV and HBV+	No	No blood available
8. OHD	<1 hour	Recorded	Exposure of non-intact skin to blood				IVDU	No	Result negative
9. OHD	13–24 hours	Recorded	Possible exposure of non-intact skin to blood				Known HCV+	No	Result not noted
10. OHD	No record	Recorded	Mucocutaneous exposure to blood				Prostate cancer	No	No
11. OHD	1 day	Recorded	No record	Yes	No	No	Haemodialysis	No	No
12. OHD	1 day	Recorded	No record	Yes	No	No	Haemodialysis	No	No
13. OHD	<1 hour	Recorded	No record	Yes	No record	Yes	Lifestyle	No	No
14. OHD	<1 hour	Recorded	No record	No	No	No record	Known HBV+	No	No blood available
15. OHD	13–24 hours	Recorded	No	Yes	No record	No record	Haemodialysis	No	No
16. A&E	<1 hour	Recorded	No record	No	No	No record	IVDU	Yes	Result negative
17. A&E*	13–24 hours	Recorded	No record	No record	No record	No record	Known HBV+	Yes	No
18. A&E	<1 hour	No record	No	No	No	No record	IVDU	Yes	No
19. A&E*	<1 hour	No record	No record	No	No record	No record	Patient origin	Yes	No blood available
20. A&E*	13–24 hours	No record	No record	No record	No record	No record	IVDU	Yes	Result not noted
21. A&E	1 day	No record	No record	No record	No record	No record	Patient origin	Yes	Result not noted
22. A&E	13–24 hours	Recorded	Yes	Yes	No	No record	Unknown source	Yes	Unknown source
23. A&E+	<1 hour	Recorded	No record	No record	No	No record	Nil	Yes	No
24. A&E*	<1 hour	No record	No record	No record	No record	No record	Nil	Yes	No
25. A&E*	1–12 hours	No record	No record	No record	No record	No record	Nil	Yes	Result negative
26. A&E	No record	Recorded	No	Yes	Yes	No record	Multiple partners	Yes	No
27. A&E	90 minutes	Recorded	No	No record	Yes	No record	Homosexual relationship	No	No
28. A&E	No record	Recorded	Possible exposure of non-intact skin to blood				Known HIV and HCV+	No	Known HIV+
29. A&E	<1 hour	Recorded	No record	Yes	Yes	Yes	Jaundice	No	No blood available
30. A&E	13–24 hours	No record	No record	No	No	No record	IVDU	No	No

HIV+, HIV positive; HCV+, hepatitis C virus positive; HBV+, hepatitis B virus positive; IVDU, intravenous drug user; +, at recipient's request.

*Advice sought from on call specialist registrar in virology.

Limitations

The study is retrospective, and as data collection was for six months, numbers are small, with correspondingly wide confidence intervals. Additionally, as the investigators were not blinded to the source of the records, the possibility of bias in record transcription must be considered.

Another limitation is possible information bias; the non-recording of information was used as a proxy for omission in procedures. The non-documentation of details may not mean that they were not considered, but in the absence of evidence to the contrary, the inference is that these factors did not contribute to overall management.

Conclusion

This study illustrates limitations in the procedures for management of occupational body fluid exposures in a large NHS Trust. These shortcomings are likely to be reflected in comparable inner city hospitals providing a similar model of service. In this Trust, the provision of a 24 hour OH telephone advice service is being considered. We would welcome findings from other Trusts, especially those with primarily non-acute services or without access to an on site OH service.

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ECHO

Harbingers of HIV infection

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With their risky behaviours and prevalence of STDs, truckers in Bangladesh pose a risk for spread of HIV, confirms a study by Gibney *et al*. Unusually for a developing country, the prevalence of HIV infection in Bangladesh is low.

Gibney *et al* determined the prevalence of STDs—syphilis, HSV-2, gonorrhoea, and chlamydia—and associated risk factors—demographic, sexual behaviours, and lifestyle (taking drugs or drinking alcohol). In a cross sectional study they recruited a final number of 388 truckers—245 drivers and 143 helpers—about 10 from each of 38 agencies selected randomly from the 185 agencies at the largest truck stand in Dhaka. Blood and urine samples were tested for evidence of STDs, and the other information was obtained with a structured questionnaire during interviews.

HSV-2 infection was high (26%), as was syphilis (6%), whereas gonorrhoea and chlamydial infection were low (2%, <1%, respectively). The only significant risk factor for bacterial infections was sex with a female commercial sex worker in the past year (odds ratio 3.54, 95% confidence interval 1.29 to 9.72) and for HSV-2 was being a helper rather than a driver on cross district routes (2.51, 1.13 to 5.55).

Bangladeshi truckers showed behaviour typical of the industry, having unprotected sex with multiple sexual partners, including their wives, sex workers, and other men. Although widely available, condoms were not used much, if at all. Convincing this group of the protection condoms afford is crucial to minimise the future spread of AIDS, given the high prevalence of HSV-2 and syphilis—both associated with spread of HIV.

▲ *Sexually Transmitted Infections* 2002;**78**:31–36.