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OCCUPATIONAL RISK OF INFECTION BY HUMAN IMMUNODEFICIENCY AND HEPATITIS B VIRUSES AMONG HEALTH WORKERS IN SOUTH-EASTERN NIGERIA

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ABSTRACT

Objective: To assess the occupational risk of infection by human immunodeficiency virus (HIV) as well as hepatitis B virus (HBV) among healthcare workers in south-eastern Nigeria.

Design: Cross-sectional study.

Setting: Three tertiary health institutions in south-eastern Nigeria.

Subjects: Doctors, nurses, laboratory staff and cleaners.

Main outcome measures: Observation of the availability and use of protective equipment and materials in the various departments of the hospitals.

Results: Materials and equipments needed for protective and hygienic practices (adequate water supply, protective clothing and availability of disinfectants) were inadequate in all hospitals. Where available, they were found to be inconsistently used. Health workers in the three institutions were thus constantly exposed unnecessarily to blood and other body fluids which might be potentially infectious as well as injury from used sharps.

Conclusion: The risk of acquiring HIV and HBV infections by health workers in this region of Nigeria in the course of performing their duties is therefore still apparently high. Though distinct viruses, they share similar mode of transmission and risk factors. Use of personal protective equipment and adoption of standard hygienic practices among health workers must be encouraged. Supply of protective materials and equipment should be greatly improved. It is recommended that reduction of occupational risks among health workers using this approach should form part of control strategies for both infections in the country.

INTRODUCTION

Infection by the human immunodeficiency virus (HIV) and hepatitis B virus (HBV) pose great health problems worldwide particularly in the developing countries(1,2). HIV and HBV are very distinct viruses but share similar mode of transmission and risk factors. Hepatitis B virus infection is a recognised occupational hazard among health care personnel especially those who regularly come in contact with blood, blood products and other body fluids of carrier patients(3). The number of HIV infected patients is increasing considerably in Nigeria and other developing countries(4) and the provision of medical care to seropositive patients is becoming a major activity for many health care personnel. The occupational risk of HIV infection results when workers are exposed to HIV infected fluids.

Needle - stick injuries are the commonest form of exposure to HIV/HBV infection(5,6). Splash incidents contribute to some extent especially when they occur on

mucous membranes or non-intact skin(7). For developing countries very few data are available on occurrence of needle - stick injuries and other such events in which transmission of HIV/HBV may occur. Supplies of hygienic and protective equipment are often lacking, thus the occurrence of incidents involving possible exposure to HIV/HBV is likely to be common here.

Health care personnel are not only more likely to become infected but because they may be unaware of their infection, they may become a dangerous source of HIV/HBV transmission to patients and fellow employees. Following the intensive interventional strategies being propagated, other modes of transmission of these diseases would become less important making nosocomial exposure more relevant.

This study is therefore designed to assess the use of general hygienic measures among health workers and the availability of protective materials/equipment needed for hygienic and personal protection of health care personnel in a cross - section of hospitals in South - Eastern Nigeria.

MATERIALS AND METHODS

Three hospitals in two states in south eastern Nigeria were visited. Two were tertiary and one a secondary health institution. They included the University of Calabar Teaching Hospital, Calabar, Federal Medical Centre, Uyo and St. Luke's Hospital, Anua. These health institutions are government owned and are located in the state capitals (administrative headquarters). The situation in these hospitals usually is a reflection of what is expected in other health institutions in the periphery.

A total of thirty five wards were covered and included medical, surgical, paediatric and gynaecological. Labour rooms, operating theatres, outpatient departments and laboratories were also surveyed.

In each of the hospitals visited, observations were made over two weeks, to assess the availability of general hygienic facilities, protective materials and equipment in the various units. These included the availability of water taps, running water or container for clean water, soap for hand washing and fresh disinfectants. The presence of containers for receipt or disposal of sharp objects which include used hypodermic needles, scapel or razor blades and broken glass wares were also noted. Also observed were the practices of disposal of contaminated materials and wastes as well as availability of protective clothing (aprons, eye wears, gloves and boots). The manner and extent of use of these hygienic and protective facilities by the various health workers was also observed.

All data were collated and analysed in groups and percentages.

RESULTS

Availability of facilities for general hygienic practices (Table 1): Although water taps were observed in all

water for washing was available in most departments. Soap for hand washing was also readily available.

There were no containers specifically identified for disposal of sharp objects in most departments in all the hospitals (0 - 58%) but plastic waste bins where the sharps were disposed off along with other items were readily available. Plastic bags, the preferred means of disposing of soiled linens were observed only in all the theatres (100%) and some wards (69%). Only one hospital adopted incineration as a means of refuse disposal, while the others used the pit.

Fresh disinfectant solution was more commonly available in the theatres and labour rooms than in the wards, out-patient departments and the laboratories. A range of antiseptics was, observed. Cetrimide was the commonest followed by saponated cresol and then chlorhexidine. Chlorine (bleach) was provided in only one labour room and antenatal department.

Availability of protective materials/equipment: Shortage of gloves was widespread. Only the theatres and laboratories had up to 10 pairs of new gloves in stock. Most departments used disposable gloves. In general, the gloves had to be purchased by the patients or relatives for use by the health workers. Aprons were available mainly in the theatres and labour rooms but not in the wards. Rubber boots were in use only in the theatres but protective eye wear was not available at all. It was observed that in some instances where these materials were available they were inconsistently or incorrectly used.

Table 1

Availability of materials for general hygienic and protective practices

	Wards n=35	OPD n=10	Percentage (%) present in		
			Labour rooms n=3	Theatres n=7	Laboratories n=12
Water taps	80	80	100	100	100
Running water	46	40	67	43	42
Container for clean water	94	100	100	100	100
Soap for hand washing	100	100	100	100	100
Presence of container for sharp objects in the unit	20	40	0	29	0
Portable container for sharp objects	34	40	0	58	0
Fresh disinfectants	40	40	67	71	0
Plastic bags for linens	69	0	33	100	0
Waste disposal in pit	60	60	67	57	58
Waste disposal by incineration	40	40	33	43	42
Gloves >10 new pairs	26	0	67	100	100
>10 reused pairs	6	0	33	0	0
Disposable gloves	100	40	100	57	100
None at all	0	0	0	0	0

OPD = Outpatient Department

departments, their presence did not guarantee presence of running water. In only one of the hospitals surveyed (33.3%) were the taps functioning. However, where running water was not available a container with clean

DISCUSSION

The study has shown that general hygienic measures as well as protective equipment used in the hospitals in

Nigeria to reduce the risk of HIV/Hepatitis B infections among health workers are insufficient. Most of the inadequacies resulted from lack of supplies. However even when available, they are inconsistently or improperly used. A finding corroborated by earlier studies(7).

The risk of acquiring infection by HIV/Hepatitis B by health workers in the course of their duties has been well documented(3,5,6,7). The importance of this occupational mode of transmission is likely to increase especially if other modes of transmission become less important following interventions. Insufficient equipment and inadequate use of hygienic measures as well as poor safety practices are thus likely to increase the risk of HIV/Hepatitis B infection.

Needle stick injuries are the commonest form of HIV/Hepatitis B exposure in health care settings(5,8). For developing countries very few data are available and even when available are a gross underestimation of the true rates. In developed countries, studies have reported injury rates ranging from 1.3% to 15.4%(9). However it can be assumed that because supplies of hygienic and protective equipment in hospitals, in this region are often inadequate or outright lacking, the occurrence of incidents involving possible exposure to HIV/Hepatitis B is likely to be commoner. This picture of inadequacy of equipment is highlighted in this study.

Chlorocresol solution (1:20 dilution) and chlorine (bleach) are recommended disinfectants for reducing HIV transmission in health care settings(7). However studies have also shown that chlorhexidine antiseptics containing detergents and alcohol also effectively inactivate the HIV virus(10). In this study only very few departments in the hospitals used chlorine as a disinfectant indicating the need to improve knowledge of health workers in developing countries on the transmission of HIV in their working environment.

Provision of adequate equipment and materials needed for reduction of occupational exposure to the risk of HIV/

Hepatitis B infection among health workers will also reduce the risk of health worker to patient and patient to patient transmission. In view of the rising prevalence of HIV infection and the fact that provision of medical care to seropositive patients is fast becoming a major activity for many health care workers, the frequency or occurrence of occupational exposure is likely to increase. The need to put in place control measures to reduce the risk to health workers of HIV/Hepatitis B infections can therefore not be overemphasised.

REFERENCES

1. Piot P., Kapita B.M., Ngugi J.M., Mann R. A. Colebunders R. and Wabitsch R. *et al.* AIDS in Africa: Manual for physicians. WHO. Geneva 1992.
2. World Health Organisation. Hepatitis B vaccines prepared from yeast by recombinant DNA techniques: Memorandum from a WHO meeting. *Bull WHO* 1985; **63**: 57 - 61.
3. Dienstag J.L. and Ryan D.M. Occupational exposure to hepatitis B Virus in hospital personnel: infection or immunization: *Am J Epidemi.* 1982; **112**: 26-39.
4. Federal Ministry of Health. Sentinel report of sero-prevalence of HIV. 1995.
5. Tokars J.L. Percutaneous injuries during surgical procedures. *J. Amer. Med. Assoc.* 1992; **267**:2899 - 2904.
6. Lettau L.A., Smith J.D. and Williams D. Transmission of hepatitis B with resultant restriction of surgical practice. *J. Amer. Med. Assoc.* 1986; **255**: 934 - 937.
7. Gumodoka B., Favot I., Berege Z.A. and Dolmans W.M.V. Occupational exposure to the risk of HIV Infection among health care workers in Mwanza Region, United Republic of Tanzania. *Bull. Wld. Hlth. Organ.* 1997; **75**:133 -140.
8. Hochreiter M.C. and Barton L.L. Epidemiology of needle-stick injury in emergency medical service personnel. *J. Emergency Medicine*; 1988; **6**:9-12.
9. Ippolito G. The risk of occupational human immunodeficiency virus infection in health care workers. *Arch. Inter. Med.* 1993; **153**:1451-1458.
10. Montefiori D.C., Robinson W.E., Modliszewski A. and Mitchell W.M. Effective Inactivation of Human Immunodeficiency virus with chlorhexidine antiseptics containing detergents and alcohol. *J. Hospital Infection*, 1990; **15**: 279-282.