

The Potential for Transmission of HIV and other Infectious Agents During Autopsy Procedures and Risks for the Healthcare Workers *

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Resumen

El riesgo ocupacional que se reporta para patólogos y técnicos de anatomía patológica de adquirir VIH y VHC puede ser tan alto como un 94%. Esto indica que estos están en riesgo por lesiones en piel y por contacto con sangre y tejidos contaminados. Por estas razones se realizó un estudio CAP sobre el riesgo de VIH en salas de autopsias y evaluación de riesgos biológicos en las mismas. La encuesta se realizó en 22 individuos (residentes de anatomía patológica, técnicos, patólogos, entre otros). Los resultados indicaron que los individuos tienen conocimientos básicos sobre los riesgos biológicos en la salas de autopsias, 27% recibió entrenamiento en esta materia. En esta población solo 5% había sido vacunado contra enfermedades adquiridas por contacto con sangre contaminada, 36% ha sufrido lesiones durante la disección de cadáveres. Las condiciones de sala de autopsia en cuanto a temperatura y ventilación fueron consideradas inapropiadas (77%). El análisis de los riesgos biológicos y condiciones laborales mostraron que el riesgo para el personal es considerablemente alto así como la bioseguridad laboral inapropiada. La sala de autopsia es una fuente de riesgos potenciales para el personal que labora allí. Por estas razones dichos riesgos y peligros deben minimizarse y debe incrementarse la educación al respecto para mejorar dicha situación.

Palabras claves: bioseguridad, VIH, patología, autopsia, riesgo laboral. *Rev Soc Med Quir Hosp Emerg Perez de Leon* 2003; 34(1-2):1-5.

Abstract

Theoretical risk of occupational HIV and HCV reported is higher as 94% for forensic pathologists and pathology-technicians. This indicate that they are at particularly high risk for blood contamination and skin injuries, so they are vulnerable to blood borne pathogens, like HIV. An exploratory, descriptive and observational study about KAP on HIV risk at autopsy rooms and evaluation of biological risks in these areas was performed. A survey was made on 22 individuals (55% pathology residents, 23% pathologists, 18% pathology-technicians, among others). The questionnaire evaluated the knowledge about biological risk in autopsy rooms, training, vaccination profile, biological exposure and accidents, use of protective measures, room and instrument decontamination, environmental room conditions, among others. Additionally assessment of biological risks and working conditions in these areas was performed. Statistical analysis was done on SPSS and Epi Info (95% confidence level). The interviewed individuals knew about biological risk in autopsy rooms, 27% received specific training ($p < 0.05$). In this population 5% have been vaccinated against blood-borne preventable diseases ($p < 0.05$), 36% have suffered injuries during dissection of dead bodies ($p > 0.05$). Autopsy room temperature and ventilation was considered inappropriate in 77% ($p < 0.05$). Biological risks and working conditions analysis showed that risk for personnel is considerably high as well laboral security inappropriate. The postmortem room is a source of potential hazards and risks, to the pathologist, pathology technician, visitors to the mortuary and those handling the body after necropsy. Postmortem staff has a legal responsibility to make them aware of, and to minimize, these dangers. The principal biological risks are the infections caused by *M. tuberculosis*, the blood borne hepatitis, HIV. All of these pathogens retain their infectivity after death. For these reasons preventive and educative measures should be taken in account to avoid these risks.

Key words: biosafety, HIV, pathology, autopsy, occupational risk. *Rev Soc Med Quir Hosp Emerg Perez de Leon* 2003; 34(1-2): 1-5.

Introduction

Pathogens persistence (including the human immunodeficiency virus, HIV) in death bodies is a concerning issue for the

pathologist as well the personnel working in the autopsy rooms ^{1,2}. For these reasons since long time ago there have been efforts directed to develop protocols and guidelines

for the management of death patients infected by the HIV³.

As we could see, the worldwide epidemic of HIV/AIDS is having profound consequences not only for the delivery of health care, but also for forensic pathologists and investigators. AIDS continues to spread in different risk groups, and deaths within some of these groups may fall under the jurisdiction of the medical examiner⁴, more beyond to the medical need for a diagnostic protocol of autopsy.

Theoretical risk of occupational HIV and HCV reported is higher as 94% for forensic pathologists and pathology-technicians⁵. This indicate that they are at particularly high risk for blood contamination and skin injuries, so they are vulnerable to blood borne pathogens, like HIV⁶.

For all these reasons, an exploratory, descriptive and observational study about KAP on HIV risk at autopsy rooms and evaluation of biological risks in these areas was performed.

Methods

A survey was made on 22 individuals (55% pathology residents, 23% pathologists, 18% pathology-technicians, among others). Place where this study was performed is omitted, but corresponded to a general hospital of Caracas, in which autopsies are regularly performed.

The questionnaire evaluated the knowledge about biological risk in autopsy rooms, training, vaccination profile, biological exposure and accidents, use of protective measures, room and instrument decontamination, environmental room conditions, among others.

Additionally assessment of biological risks and working conditions in these areas was performed.

Statistical analysis was done on SPSS and Epi Info (95% confidence level) (p significant <0.05).

The final goal of this work was to increase the awareness among pathology and autopsy rooms personnel about the risks in those areas of transmission of infectious agents, including HIV. A brief review on the current

legal statements related as well national and international guidelines on HIV prevention on these areas were also performed.

This study was part of a pathology-technicians thesis (from MF, EL, MR, WT and JY).

Results

The interviewed individuals knew about biological risk in autopsy rooms, 27% received specific training ($p<0.05$).

Although that, in this population just 5% have been vaccinated against blood-borne preventable diseases ($p<0.05$) (these include antitetanic toxoid, and HBV, among others).

On these procedures, 36% have suffered injuries during dissection of dead bodies ($p>0.05$), being all reported (in the institution the evaluation and corresponding administration of vaccines and prophylaxis has been considered efficient by the Ministry of Health of the country, with antiretroviral prophylactic available drugs).

About the personal protection devices, there was a considerable variation in its use, ranging from 5% to 100% among interviewed people ($p<0.05$). Although this, the decontamination after procedures with sodium hypochloride is performed by 100% of workers.

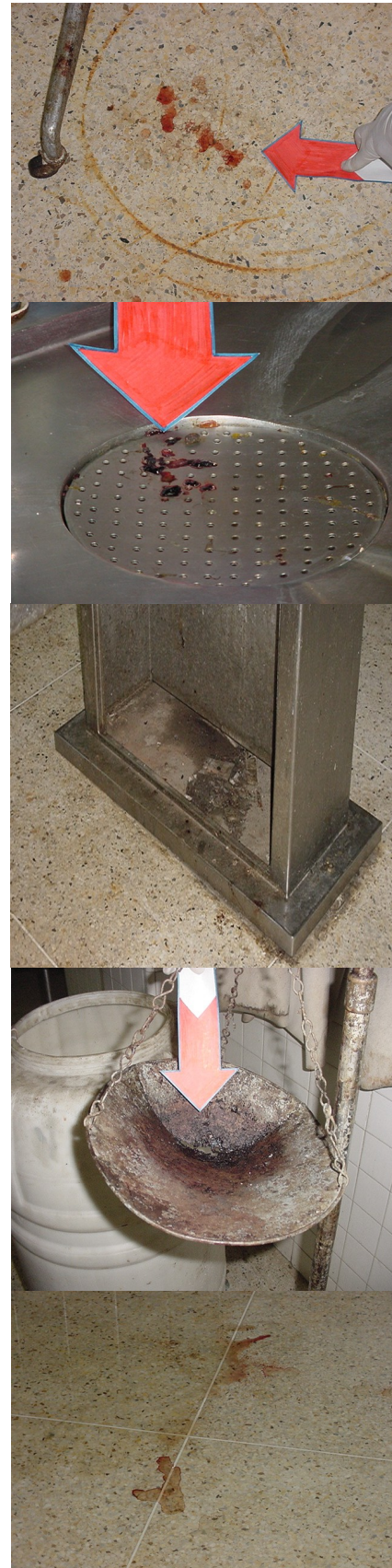
Autopsy room temperature and ventilation was considered inappropriate in 77% ($p<0.05$). Additionally to this, sanitary rooms were considered on inappropriate conditions by 100%.

Biological risks and working conditions analysis showed that risk for personnel is considerably high as well laboral security inappropriate.

The environmental conditions were photographically documented (see the figures). As we documented herein, biosafety is inappropriate posing a considerable risk for all the personnel working in these areas.

The accumulation of solid and liquid residuals on the autopsy room should be avoid, light conditions should be improved, floors cleaning too, and even more, the ventilation and then the room temperature, as well to further air flow should be studied, to be also improved.

Figures 1-10. Evaluated working biosafety conditions in autopsy rooms.



Discussion

The postmortem room is a source of potential hazards and risks, to the pathologist, pathology technician, visitors to the mortuary and those handling the body after necropsy. Postmortem staff has a legal responsibility to make them aware of, and to minimize, these dangers ⁷.

The principal biological risks are the infections caused by *Mycobacterium tuberculosis*, the blood borne hepatitises, HIV. All of these pathogens retain their infectivity after death ¹⁻⁷.

Additionally to the concept of risk, hazard, should be also added and explained. Although these terms are often used interchangeably, they are not synonymous in the context of health and safety. The danger of injury posed by a slippery floor, the sharp corner of a table, the blade of a knife or saw, or the point of a needle represents a hazard. In contrast, the chance of acquiring a blood borne infection such as hepatitis B virus (HBV) or human immunodeficiency virus (HIV) from a sharps injury represents a risk.

Pathogens may be acquired by inhalation (of aerosols), ingestion, direct inoculation, entry through pre-existing breaks in the skin, and through the mucous membranes of the eyes, nose, and mouth. Any procedure that may result in infection through one of these routes constitutes a hazard ⁷⁻⁹.

Given the importance of many issues related to HIV during necropsy procedures, one of these is related to the viral load and CD4 counts in the death patient. Those working in the postmortem room should be aware that the viral load in peripheral blood CD4+ T cells is greatest during the acute phase of the infection⁷¹ and during the final stages of the disease, when an increasing viral load is associated with a decline in CD4+ T cells and a rapidly deteriorating clinical course. Consequently, HIV titres at necropsy may be greater than in many living patients with HIV ^{7,10-12}.

For these reasons preventive and educative measures should be taken in account to avoid these risks.

High prevalence of various infectious diseases in the population poses a great risk

of occupational hazards to the forensic pathologist/autopsy surgeon and other staff involved in the postmortem examination. They may be exposed to a wide variety of infectious agents such as HIV, Hepatitis B, C, viruses, *Mycobacterium tuberculosis*, etc. Other hazards include toxic chemicals like formalin, phosphine gas and organo-phosphates, etc. Furthermore, practically, it is almost impossible to know the medical status (whether HIV, HBV, HCV, Tuberculosis, etc, present or not) of each and every deceased person. It is therefore prudent to consider all the dead bodies to be potential carriers of infection and follow the Universal Precautions, while conducting autopsy on them. Proper assessment, personal protective equipment, appropriate autopsy procedures and infrastructural modifications can substantially reduce the risks of occupational health hazards in the autopsy rooms. Accordingly, periodic training and education in safe postmortem procedures, prevention of sharp's injuries and other kinds of exposures should be imparted to the forensic personnel regularly. They should be aware of the potential transmission of these infections and the use of preventive measures. Non-availability of the vaccination for some of these deadly infections alerts that avoidance to such an exposure is the only prevention by the use of universal precautions while at work ¹³.

By wearing cut-resistant mesh undergloves, prosectors can reduce their risk for sustaining autopsy-related cuts ^{5,14,15}. Currently, autopsy prosectors do not uniformly wear this form of personal protective equipment. Given the significant potential for autopsy transmission of bloodborne pathogens, forensic pathologists and their assistants should routinely wear these undergloves ⁵.

Further research on educational and preventive measures in these epidemiological settings is expected.

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