



REVIEW ARTICLE

Occupational Exposure to Infectious Diseases among Health Workers: Effects, Managements and Recommendations

Godfred Yawson Scott^{1*} , Kengo Nathan Ezie^{2,3} , Zakariya'u Dauda⁴ , Angyiba Serge Andigema⁵  and Felix Amekpor¹ 

¹Medical Diagnostics, Kwame Nkrumah University of Science and Technology, Ghana

²Faculty of Medicine and Biomedical Sciences, University of Garoua, Garoua, Cameroon

³WINNERS Research Foundation, Garoua, Cameroon

⁴Department of Medical Laboratory Science, Usmanu Danfodiyo University Sokoto, Nigeria

⁵Departement of Microbiology, Immunology and Hematology, University of Dschang, Cameroon

*Corresponding author: Godfred Yawson Scott, Medical Diagnostics, Kwame Nkrumah University of Science and Technology, Ghana



Introduction

Healthcare professionals work with patients in settings that are regarded as some of the highest-risk workplace conditions. Healthcare workers' lives, safety, and well-being are in danger due to occupational risks such biological, chemical, physical, ergonomic, psychological, fire and explosion, and electrical dangers. According to estimates, 1 in 10 healthcare professionals worldwide get a sharp injury each year [1].

In the study of [2], a chemical or risk factor present in the workplace that is external to the employee is referred to as occupational exposure. The idea and many forms of occupational exposure among healthcare workers are further clarified by the International Hazard Datasheets on Occupations. Physical dangers, chemical hazards, biological hazards, accident-related hazards, and psychological and organizational aspects are only a few of the occupational exposures. If health workers do not pay attention to personal protection during diagnosis, treatment, nursing, and surgery, they can easily be hurt by hazards in their workplace [2].

Moreover, Health Professionals are impacted by occupational exposure not only physically but also psychologically. A very obvious risk to China's ambitious healthcare reform is the deterioration of the doctor-

patient relationship. The doctor-patient relationship has attained an unparalleled degree of stress in China right now [3].

In addition [4], Policies to make the healthcare environment safer for healthcare workers can be informed by a better understanding of the prevalence of occupational hazards among healthcare professionals in sub-Saharan Africa. Therefore, the goal of this systematic analysis was to investigate how often healthcare professionals in sub-Saharan Africa are exposed to blood and bloodborne diseases.

Occupational Infectious Diseases

Health workers are at the front line of every outbreak response and as such are exposed to different hazards that put them at risk. Occupational hazards include exposure to pathogens, violence, harassment, stigma, discrimination, heavy workload and prolonged use of personal protective equipment (PPE) [5]. The most common occupational infections of concern in the health sector are tuberculosis, hepatitis B and C, HIV/AIDS and respiratory infections (coronaviruses, influenza). Needle stick injuries contribute to 39%, 37% and 4.4% of hepatitis C, hepatitis B and HIV infections respectively [6,7] the prevalence of acute hepatitis B infection among health workers globally is 5.3%. About

54% of health workers in low- and middle-income countries have latent TB infection [6]. Many of these respiratory tract pathogens are readily transmitted where employees congregate (workplace risk factors), while worker risk factors seemed to be of increasing importance. By analyzing existing knowledge of these risk factors, identifying new risks and susceptible risk groups, this review aims to raise awareness of the issue and provide reliable information to establish more effective preventive measures. Occupational infections could generally be classified based on their source and mode of transmission [7,8].

Healthcare Professionals as a Source of Transmission

Nosocomial infections cause considerable morbidity and mortality. Healthcare workers (HCWs) may serve as vectors of many infectious diseases, many of which are not often primarily considered as healthcare-associated [9]. The probability of pathogen transmission to patients depends on several factors, such as the characteristics of a pathogen, HCW and patient [10]. Surveillance of occupationally acquired infection is problematic. If all health workers are fully immunized according to the routine immunization schedule [11] then we should be able to avoid 75% and 25% will be based on our practices. Laboratory and pathology staff handle pathogens or potentially infected specimens, and mortuary staff are potentially exposed to infected cadavers. Both the patients and the HCW need to be protected from contracting or transmitting hospital-acquired infections by using recommended infection control measures [12].

Prevention and Control of Occupational Infections

The World Health Organization (WHO) reports that lung diseases (coronaviruses, influenza), hepatitis B and C, HIV/AIDS, and tuberculosis are the most prevalent occupational infections to be concerned about in the health industry [13].

Occupational Infection Prevention and Control (OIPC) training programs are designed at the local or national level by the ministry of health and/or professional organizations to combat these illnesses [13,14]. The most efficient control method is to eliminate exposure to infectious danger in the workplace. Measures should be done to prevent or lessen the spread of the disease and its concentration in the working environment if the risk cannot be removed from the workplace. The cornerstones of improving infection prevention and control (IPC) procedures are education and training in order to get over these obstacles [14]. Healthcare workers' (HCW) awareness should cover topics like hand hygiene, wearing personal protective equipment (PPE), immunization for the prevention of communicable diseases, modes of infection transmission, spotting

infections in patients, decontaminating medical equipment, handling medical waste, and needlestick and sharp safety regulations.

In order to ensure the reduction of healthcare occupational infections (HOI) in healthcare settings, HCWs should adhere to certain IPC precautions, procedures, and tactics [15,16]. Employing antibiotics appropriately to prevent and treat infections while adhering to normal sterile procedures when performing surgery, caring for wounds, and inserting and maintaining medical equipment like intravenous cannulas and urine catheters are of paramount interest [16].

Management of Occupational Exposure to Infections

Healthcare occupational infections are a threat to their entourage's safety. Researchers reported that the spread of infections among coworkers accounted for 45% of the reported occupational source infections in a study on the occupational management of healthcare professionals exposed to COVID-19 [17]. The removal of protective gear during meals and rest periods in the staff and changing rooms were identified as the most frequent times of infection. The WHO's interim guidance of 2 February 2021 categorized mitigation strategies into four categories: Low risk, medium risk, high risk, and extremely high risk where HCWs are advised to: Stay at home if you're feeling under the weather; practice good hand- and respiratory hygiene; use PPE (a respirator N95 or FFP2 or FFP3, a gown, gloves, eye protection, and an apron) and follow basic safety procedures when caring for patients [18,19]. The simplest strategy to avoid the high expenses associated with managing workplace exposures to blood and other fluids is to prevent exposures. So we could say Some suggestions made to curb occupational exposure like during HIV infections [19] include: Post-exposure prophylaxis (PEP); If possible, the HIV status of the patient who was the exposure source should be determined to determine the need for HIV PEP; PEP medication regimens should be started as soon as possible after occupational HIV exposure and should be continued for a 4-week period; A recent suggestion is that PEP treatment regimens should include three or more antiretroviral medications [20]. The mainstay of PEP is hepatitis B vaccine, but, in certain circumstances, hepatitis B immune globulin is recommended in addition to vaccine for added protection.

Potential Risk to the Healthcare System

Healthcare personnel are most vulnerable to occupational infections due to biological variables in their workplace, which are a major risk factor in the transmission of infection as they come into contact with bodily fluids during daily tasks [21].

Effectively caring for ill patients while preserving the

security of healthcare professionals (HCPs) who face a higher risk of infection has been a significant problem for local healthcare systems [21,22], while the local healthcare system makes up a greater component of the global healthcare system.

The World Health Organization estimates that about three million people are exposed to blood pathogens annually through percutaneous means, of whom 2 million, 0.9 million, and 170,000 healthcare workers and professionals were exposed to the hepatitis B virus, the hepatitis C virus, and the human immunodeficiency virus, respectively. More than 90% of these exposures took place in developing nations, particularly in sub-Saharan Africa [23,24].

The current COVID-19 pandemic is impacting the global population in a way that has never been seen before and is also increasing occupational exposure to the virus among healthcare professionals [25]. Healthcare workers (HCWs) in low- and middle-income countries are also at risk for occupational health problems due to hospital-acquired tuberculosis (TB) infection caused by *Mycobacterium tuberculosis* (MTB), which is one of the top 10 leading causes of mortality worldwide [26].

The Centers for Disease Control and Prevention's standard precautions, which include maintaining proper personal hygiene, using protective barriers, and properly disposing of sharps and other clinical waste, could help prevent occupational exposure to infectious materials like blood and other body fluids [27].

Strategic Plans for Health Professionals' Safety

It is vital to take action to stop the infection's source and its path of transmission in order to prevent and control infection. Personal protective equipment (such as masks and gloves), antibiotics, or vaccine can be given to susceptible personnel as a kind of protection. Many higher-income nations demand that employers evaluate the risks associated with exposure to all potentially harmful substances (including biologic agents) and put protective measures in place to minimize those risks as far as is practically practical [28].

To manage, eliminate, or decrease occupational exposure to hazards, integrated methods to occupational health and safety, including engineering measures and administrative regulations, should be put into place [29].

Additionally, priority initiatives need to be put into action, such as bolstering international and national policies for health at work, promoting a healthy workplace and healthy work habits, enhancing occupational health services, creating occupational health standards, and bolstering research [30]. If you experience a needlestick, cut yourself with a sharp instrument, or were exposed to the blood or another body fluid of a patient, immediately follow these steps:

- Wash the site of the needlestick or cut with soap and water.
- Flush splashes to the nose, mouth, or skin with water.
- Irrigate eyes with clean water, saline, or sterile irrigants.
- Report the incident to your supervisor or the person in your practice responsible for managing exposures.

Seek medical attention right away from a licensed healthcare provider¹, since in some circumstances, prompt initiation of postexposure treatment may be advised [30].

Conclusion

There are primarily two categories of biological agents that are important for occupational health. The second group included organisms that, when present in the workplace, cause the production of bioaerosols. The first group included infectious diseases, including but not limited to zoonotic infections, for which certain occupational groups are at increased risk. These bioaerosols may be infectious or non-infectious (for example, endotoxins) (eg, influenza and measles virus). The combination of risk factors (illness, workplace, and worker risk factors) could lead to a more thorough risk assessment plan. Care of afflicted cases and prevention will benefit from the acknowledgment of occupational variables as a significant contributor to the transmission of these illnesses. The successful prevention of these illnesses depends on ongoing awareness of emerging workplace infections, improvements in preventive measures, and a skilled occupational health team collaborating with infection control specialists. It is critical that all workplaces have risk response strategies for infectious illnesses given the huge number of people working in occupations that frequently expose them to disease and infection. Given the relatively high incidence of occupational exposure in this study, it is critical to encourage Healthcare professionals' education, training, and awareness as part of preventive measures.

In addition, it is wise to increase the reporting of occupational exposure to bodily fluids like blood and secretions and to tighten up compliance with general precautions. This investigation also serves as a crucial reminder that public health measures, which could safeguard both employees and the communities they serve, have a significant impact in the workplace.

Recommendations

As a result, efforts should be undertaken to limit the high burden of workplace infectious disease exposures through the efficient use of standard precautionary measures in addition to occupational health and safety measures.

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