

Health Professionals Infected with HIV Virus

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Abstract

HIV, as well as the disease it causes, can be the subject of professional interest and research by many healthcare professionals. Some health professionals - doctors, nurses and technicians, laboratory workers, dentists and many others - are directly involved in the care of people infected with HIV. Individuals may also find themselves in a more intimate relationship with people infected with HIV: they may be members of their families, neighbors, friends, work colleagues, etc. Occupational exposure of health care professionals to HIV is a particular problem, because some health professionals are more likely to be exposed to blood and other body fluids and tissues that may contain blood, including HIV, and many other causes of blood borne diseases due to the nature of their work.

Keywords: HIV; AIDS; Risk

Introduction

AIDS is a disease of the immune system caused by a virus-the human immunodeficiency virus, or HIV [1]. People who become infected with HIV slowly develop damage to their immune systems. This usually takes months, or years. When the immune damage is minimal, a person with HIV doesn't notice anything at all. If the immune damage gets worse, the person may notice swollen lymph nodes or experience certain mild infections of the skin or mouth. If the immune damage gets quite severe, people with HIV lose the ability to fight off serious infections and cancers. If one or more of these serious infections or cancers develops, or if the immune system is very weak, the person is said to have AIDS: acquired immune deficiency syndrome.

HIV (human immunodeficiency virus) is a virus which damages the body's immune system [2]. HIV destroys a type of white blood cell called the CD4 cell. This cell spearheads/leads the body's defence against infection. When a person's CD4 count becomes low he/she is more susceptible to certain infections. HIV is transmitted:

- Having unprotected sex with an infected person.
- Sharing a needle/equipment to take drugs.
- Receiving a blood transfusion from an infected person.
- Transmission from a positive mother to her baby during pregnancy, delivery, and by breastfeeding.

Universal infection control precautions refer to a broad set of practices intended to prevent exposure to HIV and other blood-borne pathogens in occupational or health care settings [3]. While predominantly employed in health care settings, universal infection control precautions have also been recommended for use in other settings-for example schools, prisons, and refugee camps-where an individual

may come into contact with infected blood and other bodily fluids and tissues. In health care settings, universal precautions may avert unintended HIV transmission from health care professionals to patients, from patients to health care professionals, and between patients through contaminated equipment. Transmission of HIV between patients and health care professionals can result from percutaneous injuries (“needlestick”) that expose a previously unexposed person to HIV infected blood. Patient-to-patient HIV transmission can be prevented by using new, or properly disinfected and sterilized, equipment. Other universal precautions include not recapping needles, using needles on only one patient, safely disposing of needles, using personal protective equipment such as gloves, masks, eye protection, and gowns, cleaning spills involving blood or other bodily fluids, and safely collecting and disposing of waste. Hand-washing is a very effective method of preventing transmission of a number of pathogens.

Whether specific consent should be obtained in order to test for transmissible bloodborne viruses is a contentious issue and one that often causes a lot of debate between bioethicists and physicians [4]. Professional attitudes toward HIV have changed considerably over the past decade due to advances in treatment. However, there is still a lot of public stigma attached to a diagnosis, and this should be taken into consideration when thinking about the pros and cons of HIV testing.

Risk

HIV was isolated from different body fluids, for example, urine, semen, cerebrospinal fluid, blood, tears, amniotic fluid, saliva, breast milk, and vaginal secretions [5]. However, epidemiologists report that HIV infection occurs mainly through sexual contact, contaminated blood, breast milk, semen, and vaginal secretions. It has been proved that blood is the major and the strongest source of infection of not only HIV but also other pathogens and is the major route of transmission in health care employees. On the other hand, infection through semen and vaginal secretions for health care workers seems to be irrelevant, because contact with these fluids is minimal, and even during contact, protective gloves are worn during patient examinations, which are sufficient to prevent infection. Also, infection through cerebrospinal fluid, synovial fluid, and peritoneal or pleural fluid seems to be very unlikely. While searching the global literature, we found one case of HIV infection during puncture and evacuation of bloody fluid from the pleural cavity. Unfortunately, the risks associated with HIV transmission and other pathogens through the aforementioned body fluids is not certain due to insufficient epidemiological data. The risk of HIV transmission through body fluids such as urine, sputum, feces, vomits, nasal secretions, sweat, and tears is low or even does not exist if they do not contain visible blood. However, these fluids are also a source of transmission for other pathogens that are dangerous to human health. Human milk can also be a potential risk factor for the infection of blood-borne viruses, including HIV. However, it is not a risk factor for health care workers (except nursing neonate), especially surgeons or anesthesiologists, because of very low or even no exposure to this type of body fluid. Also, saliva of patients infected with the HIV poses no threat to the daily works of surgeons and anesthesiologists. This was demonstrated by epidemiological data gathered from studies among families living with a HIV-positive member, where HIV was not transmitted to other family members, despite the contamination of open wounds with saliva from the infected family member. However, that saliva is a potential source of infection of hepatitis B virus (HBV).

Most of the people with AIDS exhibited high-risk behaviors which led to HIV infection. This also applies to health care workers whose risky behaviors are the cause of ~95% of HIV infections, and the cause for the remaining 5% of transmission of HIV infection has not been determined. In workers of professions other than medical, only 3% of the employees cannot clearly determine the cause of HIV infection. The daily routine of health care workers, including surgeons and anesthesiologists, leads to the fact that they do not treat every patient as a potential HIV-positive. Only when the patient is from the risk group (male homosexuals and bisexuals, intravenous drug abusers, hemophiliacs, and the child of parents who are HIV-positive), they start to take precautions.

Many surgeons and anesthesiologists think that HIV testing should be performed before surgery or any other invasive procedure. In addition, a negative HIV test in a patient at risk group could reduce vigilance and care of health care workers by the conviction that there is no risk in such patients, who still exhibit high-risk behavior and who in the recent past could have become HIV-positive or is in the sero-

logical window. The long incubation time between HIV infection and clinically recognizable sequelae such as AIDS will result in a growing population of asymptomatic HIV carriers. Simultaneously, the cohort of infected patients will be aging and more will become candidates for procedures such as major vascular reconstruction or artery bypass grafting, where the risks of blood contact and staff injury are high. Therefore, it is necessary to realize that every patient can be HIV-positive or can be infected with other blood-borne pathogens; hence, it is very important to apply safety rules in each day for all patients during each medical procedure.

Needlestick

All hospitals and healthcare settings should have a needle-stick injury policy to provide advice and support to doctors and members of the public on what to do in the event that they are injured by a contaminated needle [4]. It is important to remember that it is not just healthcare workers that are at risk of injury - tattooists, refuse collectors and members of the public who may come across discarded drug paraphernalia are all considered at risk.

When assessing a needlestick injury the first thing to do is to consider the risk of contamination by identifying (if possible) the source of the blood and the subsequent likelihood of that individual having HIV. If the source is identified and that individual has capacity, they should be asked sensitively about the risk of them being HIV-positive. Consent must always be gained for testing and it should be obtained from a healthcare worker other than the person who sustained the injury. A pre-test discussion, to establish informed consent for HIV testing, should cover the benefits of testing for the individual and details of how the results will be given. Lengthy pre-test HIV counselling is not a requirement, unless a patient requests or needs it. Healthcare professionals should be able to obtain informed consent for an HIV test in the same way that they do for any other medical investigation. In the scenario above consent can be sought from the intoxicated patient once he has sobered up. If he refuses to undergo testing, that must be respected.

In nearly all cases a blood sample should be taken from the recipient of the injury to test for bloodborne viruses. The risk of bloodborne virus transmission determines what action should be taken. Despite the fear of needlestick injuries the actual risk of contracting a blood-borne infection from a sharps injury is very low.

The law is very clear that tests performed on patients who lack capacity can only be done in their best interests. Unless the individual was known to be at high risk of having HIV and may benefit from treatment, testing without consent would not be in their best interests. Ethically it could be argued that the individual who had sustained the needlestick injury also has a right to be protected from infection. It is questionable, therefore, whether there should be a limit to the rights of a patient, where there is a risk of harm to another individual. Consequentialists would argue that it is justifiable to test an incompetent patient's blood as a blood test is of minimal harm to the patient but can provide information that will prevent harm to a healthcare worker. Usually someone who has sustained a needlestick injury would take post-exposure prophylactic medication as soon as possible to reduce the chance of transmission. This medication may have unpleasant side effects and would not need to be continued if the patient was tested and the test is negative for bloodborne viruses.

Needlestick injuries in health care personnel are common, with a frequency of greater than 600,000 incidents per year in the United States [6]. It is also estimated that only half of the true total number of events are reported. Surgical residents are at particular risk for this injury for many reasons. They are continuously exposed to sharp instruments and blood while trying to develop their surgical skills. Data also suggests that their patient population has high prevalence rates of bloodborne viruses such as hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV).

If a health care provider is exposed to a patient's blood through a needlestick, they should immediately and thoroughly cleanse the area with soap and water and then notify their facility's infection control department for advice regarding postexposure prophylaxis (PEP) to reduce HBV and HIV transmission. Currently, no PEP exists to prevent hepatitis C transmission.

After an occupational exposure with a single needlestick, the risk of hepatitis B transmission is extremely low for those health care providers who have been vaccinated for the virus. Without vaccination the risk of infection ranges from 6 to 30 percent. Risks for hepatitis C and HIV infection are 1.8 percent and 0.3 percent, respectively.

Oral lesions

No other systemic diseases have as high a significance in oral health as HIV/AIDS [7]. Early on in this epidemic, many studies demonstrated a wide variety of oral lesions in individuals with HIV/AIDS. These lesions, from infections to neoplasms, are common; studies have shown that about 40 - 50% of HIV positive persons have oral fungal, bacterial or viral infections, often occurring early in the course of the disease. Manifestations of these infections have been used in diagnosing HIV infection and subsequent disease progression to AIDS. The presence of oral candidiasis, oral hairy leukoplakia or Kaposi's sarcoma strongly suggests HIV infection. After the inception of Highly Active Anti-Retroviral Therapy (HAART), these oral lesions often changed in frequency and severity to a certain degree; however, they are still valuable in monitoring disease process and treatment failure, especially in circumstances where viral load or CD4 counts are not easily or frequently accessible. With HAART, many oral lesions related to the HAART medications' adverse effects can affect patients' quality of life and need to be treated collaboratively with physicians and other healthcare providers. In summary, dentists' knowledge of oral lesions and the advantages of the accessibility of oral manifestations in dental care can contribute valuable information in early disease diagnosis, progression and/or treatment failure, to the physicians who care for persons with HIV infection.

Gloves

An important aspect to remember about gloves when dealing with infectious diseases that are passed through the blood, such as HIV, is that the glove will protect against a solid needle contamination relatively effectively, even if the needle is blood soaked [8]. The reason for this protection is that, for most gloves that have elasticity, the glove will seal against the needle or other smooth sharp object passing through it, essentially wiping the blood off the surface as it passes through.

The gloves, however, are not effective for rough materials, such as shrapnel, metal shards, or sharp debris, because the surfaces have crevasses that can hold the blood away from the wiping action of the glove, thus bringing it through the glove to the skin. Also note that gloves are not effective against tears, whether by material failure from stretch, chemical degrading of the material, or the ripping by a sharp object. Double gloving is often recommended and will protect the wearer to some extent, especially against the materials failures.

Although the gloves are relatively effective for solid needle punctures, they have very limited effectiveness for hollow needle punctures. Hollow needles are the ones used for blood drawing, starting intravenous lines, and giving injectable medications. The reason for the lack of protection is that the hollow needle is like a tiny tube. The blood or contaminant will be inside the tube, as that is the way it can be delivered to the body by injection. However, the elasticity of the gloves causes them to cling to the outside of the tube, wiping off the contaminants from there, but the contaminants inside the tube are untouched and can penetrate the glove and enter the skin of the victim. This is the reason that HIV prophylaxis is recommended in many needle stick injuries.

Society and health

Social conceptions of health and valuations of health in society also determine the ways in which health funding for medical and social science and innovation is prioritised and thus what type of health knowledge is utilised and valued in society [9]. The social construction of illness and the cultural meanings ascribed to ill health have a long history in sociology and is distinct from biomedicine. Nonetheless, research on stigma, for example, increasingly highlights the manner by which stigma as a social process has moral-somatic consequences (affecting physical health states) and moral-emotional consequences (affecting emotional health), which reinforce the social-medical aspects of social processes, such as stigma and discrimination against those who are excluded or pushed to the margins of society.

In the case of both endemic factors that threaten health (such as violence, poverty and substance abuse), and epidemics (such as influenza, Ebola or HIV), society determines what health threats are acceptable and what actions must be taken to protect health. This is a recognition of social values and tolerance of factors and social conditions that shape health negatively, whether it is child marriage, domestic violence, hazing rituals of young people, or female genital mutilation. Such practices can be sanctioned or challenged by public policy and norm setting.

The experience of living with HIV/AIDS is highly variable and unique to each individual [10]. Each person living with HIV/AIDS brings to the experience a personal history, beliefs, and values. The crisis associated with the diagnosis forces many PLWH (Abbreviation for persons living with HIV) to reexamine their own lives. This self-inventory often results, over time, in an inward transformation. Life is no longer about going through unconscious motions but rather about deliberate attempts to find meaning in every circumstance and relationship. What every PLWH fears is being reduced to a disease. Medication side effects and disease progression cause changes in body habitus. The focus of appointments with health care practitioners is often laboratory values and medication compliance, reducing the individual to little more than a “bag of blood” and a “drug cocktail.” Who the patient is can get buried underneath the disease, and soon everything in his or her life is interpreted through “HIV-colored glasses.” Persons living with HIV can find their passion and purpose in life thwarted unless they become consciously aware that they are more than their disease and view their HIV status as an opportunity rather than obstacle.

Morbidity

The basis for all epidemiological analysis is the determination of the types and levels of morbidity, disability, and mortality characterizing a particular population [11]. The denominator in this equation-the population at risk-is usually readily available. The problematic aspect of the equation is the numerator-that is, the existing number of cases of the condition. As a consequence, much of the research that takes place with regard to disease incidence/prevalence focuses on identifying the number and characteristics of the cases of the health condition under consideration.

In clinical settings a diagnosis is made by a health professional, usually a physician and usually based on the results of diagnostic tests. These diagnoses, which provide the basis for identifying the morbidity characterizing a population, can be recorded at a physician office, a clinic, an outpatient diagnostic facility, or a hospital, often based on the results of tests performed by an external laboratory. A primary diagnosis is typically attached to the individual based on presenting symptoms. This process may involve a preliminary diagnosis (e.g. upon arrival at the hospital emergency department) which will be converted to a “final” diagnosis upon discharge from treatment. The challenge for the diagnostician is to sort through various symptoms to determine from among the many options the correct diagnosis or diagnoses. This process involves “differential diagnosis” in which the diagnostician seeks to systemically eliminate unlikely diagnoses until an ultimate determination can be made.

There may be cases in which an inaccurate diagnosis is recorded. Most incorrect diagnoses are accidental and reflect inconclusive test results or the inaccurate interpretation of these results. There are occasions, thankfully rare, when an incorrect diagnosis may deliberately be assigned. This might occur when the practitioner is seeking to protect the patient, the patient’s family, or some other party from embarrassment or liability. The misidentification of a case may be made when a case is diagnosed or at the point where the diagnosis is entered into an official record. There have been incidences in which celebrities, for example, when hospitalized were assigned a misleading diagnosis in order to protect their privacy should their medical records be inappropriately accessed. This could also happen in the case of a family doctor who is loathe to assign a diagnosis of HIV or some mental disorder on the grounds that members of the family might be upset. Fortunately, such cases are thought to be extremely rare today.

There are also situations-and in this case all too common-in which an identified case is not reported. Given the large number of physicians and other practitioners, hospitals, medical laboratories, and other entities, it is not surprising that some cases that should be re-

ported fall through the cracks. After all, despite the reporting of certain conditions being required by law, disease reporting still remains an essentially voluntary activity. The failure to report is usually unintentional as in the case of the harried physician who identifies an HIV-infected person among his patients but neglects to report the case to public health authorities.

Individuals who are to receive HIV testing must be given counseling prior to administration of the HIV test [12]. The counseling must occur in a confidential setting. Counseling should include a discussion of how HIV can be transmitted, how HIV can progress, and that the results of a blood test for HIV antibody may be positive, negative, or indeterminate. The participant should be given an explanation of what each of these results means. Additionally, the participant should be told that HIV infection is not the same as AIDS and that the HIV test cannot detect HIV infection when someone is in the window period between exposure and the development of antibody. The participant's personal risk factors for HIV should be discussed, as well as techniques to reduce or eliminate any currently existing risk factors. Arrangements should be made for the participant's return to get the test results. Pretest counseling should also include a discussion of what the participant would do were the result to be positive and likewise were the result negative.

Posttest counseling should occur when the individual returns to receive his or her HIV test results. Such counseling includes reporting the result of the test to the individual, explaining the meaning of the result, discussing the participant's concerns, and discussing how to avoid transmission of HIV and other sexually transmitted diseases. Both HIV-positive and -negative individuals should be provided with a list of resources for further information and counseling.

Conclusion

HIV infection is caused by human immunodeficiency virus or abbreviated HIV, which attacks the human immune system. AIDS indicates a condition when the immune system is significantly weakened and when so-called opportunistic diseases and some cancers (acquired immunodeficiency syndrome). In medical professionals, the most common incident situations are those that carry the risk of HIV transmission, but also of other blood-borne pathogens, injuries through the skin, such as needle stabs and cuts to various sharp objects. Any contact with contaminated blood does not inevitably cause an infection by an exposed healthcare professional.

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