Rapid Review #61: August 2012

Rapid Response Service

HIV risks associated with tattooing, piercing, scarification and acupuncture

Question

What are HIV risks associated with tattooing, piercing, scarification and acupuncture?

Key Take-Home Messages

- There is strong evidence supporting the risk of hepatitis B, hepatitis C and/or syphilis transmission through unsafe tattooing practices (1-3) though the evidence is less clear when it comes to HIV transmission.(3-6)
- The prevalence of blood-borne diseases and subsequent risk of transmission through tattooing is especially high among people in correctional facilities.(1;2;7-11)
- The popularity of tattooing and piercing, especially among young people, and the risk involved with these activities makes it worthy of attention. Risk reduction messages to youth should consistently address these behaviors. (12;13)
- We found no research evidence about the HIV risk associated with scarification, body piercing or acupuncture. General preventive rules and guidelines similar to other blood-borne infectious diseases (i.e. hepatitis B and C) should be followed to prevent onward transmission through these practices.

The Issue and Why It's Important

Information on tattooing and piercing is typically included in screening interviews of prospective blood donors and can be used as a reason for deferral given possible associations with the transmission of a number of blood-borne infectious diseases.(3) Tattooing involves piercing of the skin with one or more needles that permanently imprint one or more pigments into the dermis, usually forming a recognizable pattern or design. Tattoos performed by professionals involve the use of electric tattoo machines, using up to 14 solid-bore needles and special dyes. Amateur tattooing may involve only a single sewing needle or

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EVIDENCE INTO ACTION

The OHTN Rapid Response Service offers HIV/AIDS programs and services in Ontario quick access to research evidence to help inform decision making, service delivery and advocacy. In response to a question from the field, the Rapid Response Team reviews the scientific and grey literature, consults with experts, and prepares a brief fact sheet summarizing the current evidence and its implications for policy and practice.

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straight pin and ink from a ballpoint pen (so called “jailhouse” tattoos) although other equipment, such as homemade tattoo machines, have also been employed. (3) Transmission of HIV attributed to tattooing has been suggested and is theoretically possible. For example, Doll reported two cases of HIV infection in the US likely to have been acquired by tattooing within prison.(14)

A recent example brought attention to the risks of tattooing practices. In 2011, the Ontario Superior Court affirmed a negotiated settlement between Peel Region and Peel Public Health and a group of individuals who were exposed to blood-borne infections as a result of the use of non-sterile equipment at a tattoo parlour.(15) Although it was unclear if anyone contracted HIV as a result of getting a tattoo or piercing at the tattoo parlour, the potential risk was a cause for concern.

What We Found

Through our searches (outlined in the ‘what we did’ section below), we identified research evidence related to the risks of tattooing but not related to scarification and piercing. The following paragraphs therefore only present findings related to tattooing.

Transmission of diseases from tattooing may be related to the use of needles that were contaminated with blood from a previously tattooed individual, or the use of contaminated dyes and other material, such as sponges or tissues used to wipe away blood. In addition, HIV has been shown to remain infectious in aqueous solutions at room temperature for up to fifteen days (16) and pigmented solutions, because they are relatively inert, may also support the virus.(4) As a result, the tattooing gun itself (not just the needles) is also a potential source of contamination for blood borne infectious diseases.(3)

The risk of transmission of blood borne infections during tattooing is attenuated given the process used. A single needlestick injury from an infected host carries with it a 5-30% risk of transmission of hepatitis B (HBV), a 3-7% risk of transmission of hepatitis C (HCV), and a 0.2-0.4% risk of transmission of HIV. (17;18) Given the rapidly repetitive process of tattooing, transmission of blood borne infectious diseases (including HIV) through unsafe tattooing practices is more likely to occur.(4) Given examples such as this and the potential for risk of infection from tattooing and piercing, it is important to better understand potential risks of HIV transmission through these means.

A systematic review published in 2001 found that seroprevalence surveys worldwide have shown that tattoos are more commonly found among HIV-positive individuals than in control groups or the general population.(3) Interpreting these studies and determining causation is made difficult due to the fact that assessment of possible causes or factors (e.g., injection drug use) is not always conducted. Only two older studies (published in 1996 and 1990) included in the systematic review assessed the risk of being HIV positive among those with and without tattoos. One study conducted in Quebec City, found that tattooing was not associated with HIV infection in both male and female prisoners.(6) Another cross-sectional study undertaken in two Spanish prisons in 1987 involving male prisoners found that having a tattoo significantly increased the odds of being infected with HIV (odds ratio = 2.8, 95% confidence interval (CI) 1.3-6.2).(19)

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Prison settings

We found several studies that documented the prevalence of and risk factors for becoming infected with blood-borne viruses in prison settings. Below is a list of key findings from these studies.

Butler et al. assessed the prevalence of blood-borne viruses and associated risk factors among prison entrants at seven Australian prisons across four states and found that prisoners with a tattoo were 2.3 times more likely to test positive for HCV (95% CI 1.50-3.44) and 1.7 times more likely to test positive for HBV (95% CI 1.01-2.74). However, the association between having a tattoo and a positive HIV test were not reported.(1)

A study from New Mexico found that getting a tattoo in prison significantly increased the odds of being infected with HBV (odds ratio (OR) 2.3, 95% CI 1.4-3.80) and HCV (OR 3.4, 95% CI 1.6-7.5) infections, but no statistical comparisons were conducted for HIV because of the small number of HIV+ prisoners.(2)

Among entrants to Irish prisons, non-users of injected drugs who were tattooed inside prison were 11.6 times more likely to test positive for HCV than those who had tattoos done outside prison, but no correlation was found for HIV.(20)

Braithwaite et al. found in a sample of adolescent detainees that although a small percentage of youth reported knowingly sharing needles for tattoos or piercings (2% and 1.5%, respectively), 21% had tattoos that had been administered unprofessionally and 20% had unprofessionally administered piercings.(12)

To reduce the risk of HIV and HCV transmission in prisons, programs that provide access to bleach have been implemented in many Canadian correctional institutions. Although the efficacy of bleach as a disinfectant is controversial, it has been suggested that its use can help prevent HIV and HCV acquisition.(21) A study conducted in seven Quebec prison facilities, found that more than one third of respondents had been tattooed while in detention, while fewer than 3% had undergone piercing.(7) Ten percent of prisoners reported having tattooed or pierced another inmate. Slightly more than 25% of the tattoos and piercings were done with materials used by someone else, or not cleaned with bleach or disinfected with a sterilizer. No significant differences were apparent regarding ethnicity and tattooing or piercing. However, most prisoners (74%) expressed a firm intention to demand that material used for tattooing or piercing in prison should be cleaned with bleach. Six determinants were significantly associated with intention: personal normative beliefs, perceived behavioural control, role beliefs; and to a lesser extent, attitude, gender (i.e., being male) and anticipated regret. The study concluded that interventions aimed at encouraging safer tattooing and piercing activities in prison should focus on inmates' sense of responsibility, obstacles impeding adoption of this behaviour and promotion of this behaviour as an integral part of the culture in the prison environment.

Correctional Service Canada (CSC) has documented widespread practices of unsafe tattooing in federal prisons and started a pilot, the Safer Tattooing Practices Initiative, that consisted of educational and operational components. (22) The operational component included implementation of tattoo rooms in six

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federal institutions. The education component informed all prisoners about the risks of unsafe tattooing practices and provided information through a guidelines document and pamphlets distributed. The CSC report evaluating this intervention found that the Initiative has resulted in an enhanced level of knowledge and awareness amongst staff and prisoners regarding blood borne infectious diseases and initial results of the initiative indicated potential to reduce harm, reduce exposure to health risk, and enhance the health and safety of staff members, other prisoners and the general public. Unfortunately, tattooing activities at most pilot sites were constrained due to the limited number of trained tattooists and implementation issues, such as the tattooist skill level, training and availability, negatively impacted the effectiveness and efficiency of the initiative.(22)

Despite the fact that the report stated that The Safer Tattooing Practices Initiative remained consistent with the goals and objectives of the Federal Initiative to Address HIV/AIDS in Canada, the federal government cancelled the project, mainly on grounds of low cost-effectiveness.(23;24)

The impact of legal prison tattooing centers remains unclear, and is unlikely to be significant as less than five percent of blood-borne infectious diseases have been reliably attributable to tattooing. In addition, this type of service is likely to be very expensive relative to potential health benefits.(23)

Factors That May Impact Local Applicability

The literature discussed dealt exclusively with HIV risks related to tattooing in high-income countries (US, Western Europe, Australia, Canada). While these findings may be relevant to the Canadian setting, countries cited in the literature have differing HIV infection rates, correctional systems, and populations, therefore findings should be interpreted with caution as they may not be generalizable. We also found a number of studies that were potentially relevant but were focused on low- and middle-income countries and we therefore excluded them from our synthesis.(25-34)

Much the research evidence identified was also focused on prison settings where the prevalence of HIV and HCV infections is much higher as compared to the general population.(8;9) Calzavara et al. reported that, in Ontario in 2003 and 2004, the prevalence of HIV infection was 11 times higher and HCV infection 22 times higher among prisoners in selected provincial remand facilities (jails, detention centres and youth centres) than among people in the general population.(10) Poulin and colleagues also report that the prevalence of HIV infection was almost 19 times higher among prisoners in selected Quebec provincial prisons than in the general population in 2003, whereas the prevalence of HCV infection was 23 times higher.(11)

What We Did

We searched Medline using a combination of search terms: HIV (text term) AND [Tattooing (MeSH term) OR Body Piercing (MeSH term) OR Acupuncture (MeSH term) OR scarification (text term)] and limited the search results to articles published in 2000 or later with study jurisdiction in high income countries. We also searched the Cochrane Library for any potentially relevant systematic reviews using the following text terms: scarification OR pierc* OR acupuncture OR tattoo*, www.Health-Evidence.ca using the following search terms: scarification OR pierc* OR acupuncture OR tattoo*, and DARE database (limited to 1996-2011) using the following search terms: HIV AND (scarification OR pierc* OR acupuncture OR tattoo*). Lastly, we reviewed the references in the studies found.

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