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# **Short Communication**

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***For further information about this article or if you need reprints, please contact:***

Dr. Batool Sharifi-Mood  
Department of Infectious  
Diseases,  
Boo-Ali Hospital,  
Zahedan, Iran

Tel: 0098/541/ 3229811  
Fax: 0098/541/3229197

## **Tattooing: A Major Source for Viral Infection**

<sup>1</sup>Batool Sharifi-Mood and <sup>2</sup>Soheila Khosravi

In order to determine the prevalence of viral infections in women who had a history of tattoo, this study was conducted. In this cross-sectional study, in a time period of 4 months from August 2005 to December 2005, a total of 39 women who had a history of tattoo for more than three months were selected randomly using random number tables from women salons in four area of Zahedan, a city in the Southeast of Iran. They were the women, who fitted the selection criteria. These criteria included; having no history of vaccination against hepatitis B and no history of hepatitis, icterus, blood transfusion, bloodlet, surgery, injection drug use and no history of hepatitis in the husbands in married women. After recording the demographic data, blood sample was drawn from each case. Then sera was evaluated with ELISA method for HBsAg and anti-HBc and antibody against HCV and HIV. Positive samples for HCV and HIV were also confirmed by western blot. Among 39 cases with history of tattooing, 3 cases (7.6%) were positive for HBsAg. Anti-HBc was seen in 30.7% of subjects. Only one case had a positive test for anti-HCV that confirmed by western blot. HIV test was positive in one case who had a history of immigration for one year to a neighbour country but this test did not confirm by western blot because she did not assist us for more evaluation. Others had no history of immigration. Although, the sample size was small, but upon present results, tattooing could be a potent risk factor for occurrence of infection.

**Key words:** Tattoo, women, hepatitis B, hepatitis C, HIV/AIDS, viral infection

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<sup>1</sup>Department of Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran

<sup>2</sup>Iran Research Center of Blood Transfusion Organization

## INTRODUCTION

According to the limited statistics available, there appears to be resurgence in the popularity of tattoos. Tattooing has been performed as a decorative practice since ancient times (Anonymous, 2002). It is now also being used for some cosmetic medical procedures and for permanent make-up applications. Tattooing involves multiple intradermal injections of the skin by a small machine having one or more needles connected to tubes containing the dyes. The tattooist guides the machine over the skin and controls its speed. The procedure involves a variable amount of pain and a small amount of bleeding (Anonymous 2001b, 2002). Even in modern facilities, tattooing is not without risks. The two most significant ones are allergic responses to the pigments and exposure to bloodborne pathogens (Anonymous, 2002). Since tattooing involves injections under the skin, poor infection control practices before, during and after the procedure by the tattooist and the consumer can lead to risk of bacterial and/or viral infection (Nishioka *et al.*, 2002). There have been cases of hepatitis B and C transmission through tattooing. Transmission of HIV is also possible with lack of proper sanitation (Emily, 2004; Rosario *et al.*, 1996; Nishioka *et al.*, 2002). Limited studies had been done in the world but all these studies defined that tattoo is a risk factor for TTDs. Since, there was no any study in our country, we decided to conduct this study.

## MATERIALS AND METHODS

In this cross-sectional study, in a time period of 4 months from August 2005 to December 2005, a total of 39 women who had a history of tattoo for more than three months were enrolled in this study. All subjects who enrolled in this study were selected using random number table, from women who referred to women salons for make-up in four area of Zahedan, a city in the Southeast of Iran. They were the women, who fitted the selection criteria. These criteria included; having no history of vaccination against hepatitis B and no history of hepatitis, icterus, blood transfusion, bloodlet, surgery, injection drug use and no history of hepatitis in the husbands in married women. After recording the demographic data, blood sample was drawn from each case. Then sera was evaluated with ELISA method for HBsAg and anti-HBc and antibody against HCV and HIV. Positive samples for HCV and HIV were also confirmed by western blot.

## RESULTS

Among 39 cases with history of tattooing, four cases had several tattoos in different sites of her body (hand, lip or face) but in others, tattoo had been done once in one site (hand or foot or lip). Out of 39 cases, 3 cases (7.6%) were positive for HBsAg. Anti-HBc was seen in (30.7%) of subjects. Only one case had a positive test for anti-HCV that confirmed by western blot. This case had several tattoos in multiple site. HIV test was positive in one case who had a history of immigration for one year to a neighbour country but this test did not confirm by western blot because she did not assist us for more evaluation. Others had no history of immigration. Prevalence of hepatitis B virus infection in women with history of tattoo was high, and there was a significant relation between tattooing and prevalence of HBV infection ( $p < 0.05$ ).

## DISCUSSION

Piercings and tattoos have been popular for centuries and are just one of the many ways that people have to express themselves and their individual sense of style. Fine-art tattooing has become a common practice, particularly among teenagers and young adults (Emily, 2004). Sociological studies of tattoo recipients, however, have shown that few recipients compare tattoo parlors or watch a tattooing procedure before getting one and few consider tattooing a future health risk. Getting a tattoo could be a key infection route for viral infections (Anonymous, 2001a; Emily, 2004). Present results showed that carrier rate of HBsAg in subjects under study was high (7.6%). This rate was higher than results in total population in Zahedan (5.4%) (Salehi, 2003). Also, carrier rate in women under study was higher than women barbers in Zahedan (Sharifi-Mood *et al.*, 2004). Recent studies found that people who had received a tattoo in a commercial tattoo parlor were nine times more likely to be infected with hepatitis C than people who did not have a tattoo (Anonymous, 2001a). A 2002 study of 454 university students found that half had piercings and a quarter had tattoos. Nearly 20% of those who had piercings reported a medical complications due to the procedure itself or how it was taken care of afterwards. Common medical complications included bacterial infections, bleeding and skin and tissue tears around the pierced area. Additionally, some people play with their piercings, biting, pulling on and twisting them, which creates problems (Emily, 2004). In one study, of 626 patients studied, 113, or 18%, had a tattoo. Of those with a tattoo, 22 percent were infected with hepatitis C. Of the

52 patients who had acquired their tattoos in commercial tattoo parlors, 33% had hepatitis C. In contrast, only 3.5% of patients with no tattoos had hepatitis C. This study found that people who had several tattoos, or complex or large tattoos, had an increased risk of having hepatitis C and that people with white, yellow, orange or red pigments in their tattoos also were more likely to have hepatitis C than those with only black (Anonymous, 2001b). In Salehi study, nearly 1% of total population in Zahedan were infected with HCV but in this study, 2.5% of women with history of tattoo were infected with HCV. In Nishioka survey, There was a significant association between an increasing number of tattoos and HBV infection (Nishioka *et al.*, 2002). Rosario *et al.* (1996) showed that tattooing could be a significant factor to be considered in relation to the transmission of HBV. HIV is a virus that could be transmitted via tattoo, for this reason tattoo artist loses battle to refuse customer with HIV (Anonymous, 1996a, b). Present results showed that only one case was HIV positive but it did not confirm by western-blot because this case refuse of more evaluation, although she had a history of immigration to a neighbour country. Tattooing has been shown to transmit other infectious diseases, including syphilis, leprosy and tuberculosis (Anonymous, 2001b; Emily, 2004). Since tattooing involves injections under the skin, poor infection control practices before, during and after the procedure by the tattooist and the consumer can lead to risk of bacterial and/or viral infection (Rosario *et al.* 1996). If appropriate disinfection and sterilization techniques are used, the health risk associated with tattooing is small. Currently, many state and local health departments regulate tattooing facilities.

### CONCLUSIONS

Any percutaneous exposure has the potential for transferring infectious blood and potentially transmitting bloodborne pathogens. Although, the sample size was small but, due to high rate of incidence of the viral infection especially HBV and HCV in cases with history of tattooing, we suggest that tattoos should be assessed as potential criteria in screening blood donor and the subject who would like have tattoo should be made aware of the

route of transmission of viral infection and need to be screened for markers of these infections after tattooing and they are prime candidates for immunoprophylaxis with hepatitis B vaccine.

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