

Pediatric emergencies for accidental needlestick injuries from discarded syringes

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To describe the characteristics of visits to a pediatric emergency department after accidental needlestick injuries and between 2000 and 2010 to estimate the likelihood of hepatitis B and C virus or human immunodeficiency virus seroconversion. A total of 160 cases were studied; 108 patients (67.5%) were boys. The median age (25th-75th percentile) was 6.3 (4.8-9.1) years. The department attended a median of 1.2 (0.8-2.0) patients with accidental needle puncture per 10 000 visits annually. The incidence tended to decrease over time. Accidents occurred most often in parks, and fingers were the most common place of puncture. No seroconversions occurred. [Emergencias 2013;25:55-57]

Keywords: Accidental needlestick injury. Hepatitis B virus. Hepatitis C virus. Human immunodeficiency virus. Risk of seroconversion.

Introduction

Accidental needlestick injuries from discarded syringes mostly occur in the pediatric population and the emergency department (ED) is the first place where the family comes for evaluation. These accidents create great social alarm due to the perceived risk of virus transmission, in particular human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C virus (HCV), and also because the serological status of the source is usually unknown or difficult to establish. It is important that professionals attending these accidents in the ED know what actions should be taken when there is risk of exposure because, if post-exposure treatment is needed, it must be started in the ED.

The prevalence of these infections in the general population is 0.13 - 4% but increases in injecting drug users^{1,2}. The actual risk of seroconversion after accidental puncture is very low, but it is still necessary do everything possible to minimize

it^{1,3,4}. The objective of this paper is to describe the characteristics of cases of accidental needlestick injuries attended in a pediatric ED and the frequency of seroconversion for HBV, HCV and HIV.

Clinical experience

The study was conducted in the ED of a Maternal and Children's tertiary level hospital which is the area reference hospital for 1,800,000 inhabitants and attends a mean 280 visits per day. Using the hospital's computerized database we selected all patients with an ED discharge diagnosis of accidental puncture in the period 1 January 2000 to 31 December 2010.

In our ED, each patient included in the study was attended by a pediatrician applying an action protocol that includes antisepsis and wound healing measures, determining the serological status of the source if possible, HBV, HCV and HIV serol-

ogy, with referral of the patient to the department of infectious diseases for follow-up at 1, 3 and 6 months, except when antiretroviral treatment is administered, in which case the referral is for the following day.

Post-exposure prophylaxis against HBV and tetanus vaccine are indicated according to vaccination status of the patient, and post-exposure anti-HIV prophylaxis is considered during 4 weeks (zidovudine + lamivudine until 2006; zidovudine + lamivudine + lopinavir / ritonavir since then) if the accident has occurred within the last 72 hours, if there has been contact with fresh blood or blood is visible on the syringe or if there are other high risk factors (deep wound or the source is known to have HIV infection). The family is informed that there is no prophylaxis against HCV but that treatment is available in case of infection.

All data analysis was performed using SPSS version 19. As none of the patients studied presented seroconversion, the probability of such an adverse event was determined using Hanley's rule of three for events that have not yet occurred in a finite number of patients (n) with an upper limit of the 95% confidence interval = maximum risk = $3/n^5$.

Results

The study included 160 cases of needlestick injuries. Average annual incidence was 1.2 (p25-75: 0.8 to 2.0) per 10,000 ED consultations, and there was a downward trend in the last five years [median incidence 0.9 in 2006-2010 vs 2.0 in the earlier period 2001-2005; $p = 0.008$ (Figure 1)]. Median age was 6.3 years (p25-75: 4.8 - 9.1 years) and 108 (67.5%) involved boys. The most frequent place of the accident was in public parks (57.8%) followed by beaches (14.8%). Median time to consultation was 5 hours (p25-p75: 2-24 hours). The most frequent anatomical site was a finger (63.4%), followed by a foot (18.8%). Twenty-six (16.3%) patients reported the presence of blood on the needle and 22 (13.8%) bled from the wound inflicted. The source of the discarded syringe was unknown in all cases and serological status could not be determined.

The established protocol was correctly followed in the ED; serological tests for HBV, HCV and HIV were carried out in all patients and prophylaxis was administered to 74 patients (46.2%) for HBV and to 8 patients (5%) for HIV: in 5 cases with combination therapy and in 3 cases with triple therapy. Two patients treated with lopinavir-

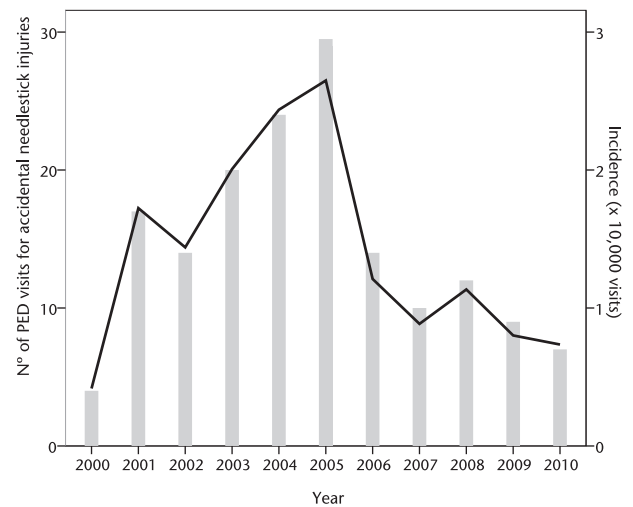


Figure 1. Annual number (bars) and incidence (solid line) of ED visits for accidental needlestick injuries. PED: Pediatric Emergency Department.

ritonavir reported gastrointestinal symptoms resulting in treatment interruption before 4 weeks. Patient follow-up was performed at 3 and 6 months in 90% and 60% of patients, respectively. No cases of seroconversion were detected, and the probability of transmission of any virus was estimated as 0.019 maximum with a confidence interval of 95%.

Discussion

The number of visits to our ED generated by accidental needlestick puncture has shown a decreasing tendency in recent years. This could be associated with fewer parenteral injecting drug users⁶ and better cleaning of parks and beaches, sites where these accidents occur most frequently. There are few descriptions of accidental needlestick injuries in pediatric medicine and recommendations on how to respond are scarce⁷⁻¹⁴. No cases of HIV infection in these circumstances have been reported. However, the possibility of this occurring cannot be ruled out, especially if the puncture is deep or if there is abundant blood on a recently used needle.

In contrast to HIV, HBV and HCV concentrations remain high in bloodied needles or other fomites. Hence, the probability of infection by these viruses is greater after accidental skin puncture^{1,15}. It is important that EDs have the specific immunoglobulin and anti.HBV vaccines for unvaccinated patients. In our study, almost half the patients required prophylaxis and initial vaccination

against HBV because in Catalonia anti-HBV vaccination was routinely performed at the age of 12 years and this was only extended to younger children and infants in 2002.

HIV prophylaxis is the most controversial, because it has not been shown to be useful in accidental, non-occupational puncture and because the risk of adverse effects is much greater than the risk of HIV infection^{1,3}. At our center, individualized prophylaxis is carried out according to patient characteristics, the specifics of the accident (deep puncture, post-injury bleeding) and the wishes of the child's family.

In follow-up after the incident, no cases of seroconversion were detected, and the probability of transmission of any virus was estimated at 0.019 maximum with a confidence interval of 95%. However, we would highlight that 40% of the cases were lost to follow up at 6 months after the event.

The limitations of this work include its retrospective nature, which means that some cases may have been omitted from the analysis, and the high proportion of cases lost to follow up, which means the conclusions should be treated with caution. However, our results confirm the usefulness of the protocol, and highlight the need for new methods to improve the clinical and serological follow up of these patients.

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Consultas pediátricas en urgencias por pinchazo accidental con agujas o jeringas desechadas

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Se describen las características de las consultas en urgencias entre 2000 y 2010 por pinchazo accidental y se analiza la probabilidad de seroconversión para los virus de la hepatitis B (VHB), C (VHC) y el virus de la inmunodeficiencia humana (VIH). Se revisan 160 pacientes; 108 (67,5%) son varones; la edad mediana es de 6,3 (p25-p75: 4,8-9,1) años. La incidencia es de 1,2 (p25-75: 0,8-2,0) consultas por pinchazo accidental/10.000 consultas y año, con tendencia a decrecer. Los accidentes se produjeron con mayor frecuencia en los parques y los dedos de las manos fueron el sitio anatómico más afectado. En la muestra estudiada es nulo el riesgo de transmisión para los virus estudiados. [*Emergencias* 2013;25:55-57]

Palabras clave: Lesión por pinchazo accidental. Virus hepatitis B. Virus hepatitis C. Virus de la inmunodeficiencia humana. Riesgo de seroconversión.