

SHORT COMMUNICATION

Risk of Hepatitis C among Brazilian Ex-soccer Players

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In order to evaluate the significance of injecting vitamins complexes and stimulants minutes before soccer games and its role in spread of hepatitis C virus (HCV) we interviewed and tested 40 ex-soccer players, who played professionally in Mato Grosso, Brazil, between 1970 and 1989. Five players were found anti-HCV positive with enzyme-immunoassay. When re-tested by immunoblot (RIBA), three of these five were confirmed to be positive reacting. The anti-HCV positivity (7.5%) was higher than usually found among blood donors (0.9%) in this region ($p < 0.01$). None of the players had had prior history of any risk factor that might indicate HCV exposure. We suggest that the common practice of soccer players in the inner part of Brazil in the 70's and 80's, to receive fortifying injections, often with shared syringes, may place ex-soccer players in a potential risk group for HCV infection and warrants further investigation and attention by public health workers.

Key words: epidemiology - parenterally-transmitted hepatitis - sports - Brazil

Hepatitis C virus (HCV) is a worldwide common cause of liver disease and a major public health problem (Seef 1998). The main risk groups are: persons exposed to contaminated blood, drug-users, long-term hemodialysis patients, and persons who received transfusions of blood components before HCV testing of donors was adopted in the 90's (Alter 1995). Less common is transmission by sexual or perinatal contact. In the US, no recognizable source of infection could be clearly identified in approximately 10% of the cases (CDC 1998). This figure may be larger in other countries (Buti et al. 1994), and in Egypt, inadequately sterilized syringes and needles may be the main cause of infection (Frank et al. 2000).

Paraná et al. (1999) reported three male HCV patients who had been amateur soccer players in the 70's and 80's in Bahia, Northeast Brazil. The authors suggested that intravenous use of vitamin complexes and stimulants minutes before games may have been a common practice and could have exposed the players to blood transmitted pathogens.

In order to evaluate the use of injections as a practice in our region (Central-Western Brazil), and its possible association with the transmission of HCV, we interviewed ex-soccer players who had played professionally in Cuiabá, Mato Grosso in the 70's and 80's (a pre-biosafety era, when disposable syringes and needles were not widely used). Our questionnaire included questions as to how long the athlete was professionally active, in which teams

and where he played, and if intravenous injections were used before games. If so, was this a common practice and were syringes and needles shared. Other risk factors, such as those listed above, were also investigated. We obtained approval from the Research Ethical Board Review at the Universidade Federal de Mato Grosso to collect blood for anti-HCV testing in players who agreed to participate.

Our final sample of 40 players was obtained after searching for nearly two years, October/2000 through July/2002, for ex-players in Cuiabá and Várzea Grande, the larger metropolitan region for the capital city, Cuiabá. We searched for ex-soccer players who had been professionally active between 1970 and 1989. We located them through the State Federation for Soccer Teams in Mato Grosso, the Soccer Players' Union, and the County Sports Department. The records were not up-to-date and many players had no registers. It was very difficult to locate players and once located, approximately, 30% did not wish to participate.

The mean age of the players in the sample was 45 years old, ranging from 41 to 53 years. All had played in Mato Grosso and 26 just in this state. Two had played in five different states besides Mato Grosso and the rest that had played in more than one state, played mainly in São Paulo or Mato Grosso do Sul. The mean time of professional activity was 8 years and ranged from 2 to 23 years. The teams they played for were generally small low paying teams. All players had received intravenous injections of vitamin complex or other substances at least once, and 60% (24) reported that it was a regular practice throughout their career. They received the injections for a mean time of 3.5 years. The injections were most often given by unskilled personnel, usually members of the team's staff. Thirty-nine players related that they actually had shared syringes and or needles with other players. Few knew exactly what substance had been injected.

All players considered themselves to be in good health at the time of the interview, although, three admitted being

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hypertensive and one suffered from kidney stones. None had received blood transfusions, used illicit drugs, had tattoos or reported having had sex with men. Seventeen had undergone surgery and five had history of sexually transmitted diseases.

Serological testing for anti-HCV with enzyme-immunoassay (EIA, AB HCVK, DiaSorin, Perugia, Italy) was carried out at the Mato Grosso State Health Department Central Laboratory (Lacen-MT). Five samples reacted positively and were re-tested with recombinant immunoblot assay (RIBA, Inno-LIA HCV AbIII, Innogenetics, Ghent, Belgium). Three were confirmed to be positive (7.5%; 95% CI = 2%; 21%).

No striking difference was noted between the three positive anti-HCV players and the rest of the sample. The mean time for which positive anti-HCV players received injections was 6.7 years, and for anti-HCV negative players it was 3.3 years. However, this result was not statistically significant for our sample size (Kruskall Wallis Test: $p = 0.06$).

It is possible that the three positive anti-HCV subjects in our 40 samples occurred at random. However, this incidence appears to be higher than that found in most Brazilian metropolitan regions (Silva et al. 1995, Focaccia et al. 1998). Data from the State Public Blood Bank in Mato Grosso indicate prevalence of 0.9% (95% CI = 0.4; 1.7) for positive anti-HCV results with ELISA among blood donors (Souto et al. 1994). In evaluating our results, we asked the following question: if the frequency of HCV among healthy adults in Mato Grosso is 0.9%, what would be the probability of having obtained, at random, a one-sample result of three anti-HCV positive and 37 anti-HCV negative persons in 40? Using the binominal formula, this probability is 0.00515 (Cochran 1963). Furthermore, when testing our results against this same study on a 2 x 2 contingency, we find $p < 0.01$ (Fisher's exact test). These results show that we well might be dealing with a separate risk group.

Bias in our sampling procedure may have occurred, but is difficult to evaluate. Our sample may have been influenced by the players who excluded themselves by refusing to participate, when the nature of the study was revealed, and by the 20 to 30 year lapse, between the time the players were active, and the time this study began. We have no way of knowing if any player who died prior to the investigation suffered from a hepatic disease caused by HCV infection (a few players did relate deaths of fellow players with cirrhosis). Consequently, bias of survivor selection may have occurred, decreasing the found prevalence (Martelli 1995).

The high frequency with which soccer players received injections of vitamin and other stimulating substances in the 70's and 80's in Mato Grosso, calls attention to the fact that these players, and others under similar conditions (working for small poor playing teams, throughout Brazil and Latin America), were certainly placed at risk for blood transmitted pathogens. We suggest that this group warrants further investigation and the attention of public health workers.

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