



Identification of recent HIV infections and of factors associated with virus acquisition among pregnant women in 2004 and 2006 in Swaziland[☆]

Daniela Bernasconi^{a,1}, Lara Tavoschi^{a,1}, Vincenza Regine^b, Mariangela Raimondo^b, Dan Gama^c, Leonides Sulgencio^c, Mauro Almaguila^d, Claudio Galli^e, Barbara Ensoli^a, Barbara Suligoj^b, Hosea Sukati^f, Stefano Buttò^{a,*,1}

^a National AIDS Center, Istituto Superiore di Sanità, Rome, Italy

^b Department of Infectious, Parasitic and Immune-mediated Diseases, Istituto Superiore di Sanità, Rome, Italy

^c National Blood Transfusion Service, Ministry of Health, Manzini, Swaziland

^d Department of Clinical Sciences, Infectious Disease Section, "Luigi Sacco" Hospital, University of Milan, Milan, Italy

^e Abbott Diagnostics Division, Rome, Italy

^f National Central Public Health Laboratory, Ministry of Health, Manzini, Swaziland

ARTICLE INFO

Article history:

Received 15 January 2010

Received in revised form 12 April 2010

Accepted 30 April 2010

Keywords:

HIV/AIDS
Recent infections
Risk factors
Swaziland
Africa

ABSTRACT

Background: HIV continues to spread at high rates in sub-Saharan Africa. In particular, Swaziland is one of the countries most affected by the HIV/AIDS pandemic. Monitoring of HIV infection in Swaziland is being made by periodical investigations on HIV prevalence in pregnant women. However, knowledge of proportion of recent HIV infections is important for epidemiologic purposes to assess HIV transmission patterns.

Objectives: To evaluate the proportion of recent HIV infections among pregnant women and its change overtime and to analyze factors associated with recent HIV infection in Swaziland.

Study design: HIV-positive sera from pregnant women were collected during the 2004 and 2006 National HIV Serosurveys conducted in Swaziland and tested for the HIV antibody avidity, in order to identify recent HIV infections. Socio-demographic and clinical information was also collected. A multivariate analysis was conducted to assess the association between recent HIV infection and socio-demographic and clinical factors.

Results: A total of 1636 serum samples were tested for HIV antibody avidity. The overall proportion of recent infections was 13.8%, with no significant difference between 2004 and 2006 (14.6% vs. 13.1%, $P > 0.05$, respectively). At the multivariate analysis, the younger age [14–19 vs. ≥ 20 years; adjusted odds ratio (aOR) 2.17, 95% CI: 1.45–3.24], as well as being at first pregnancy (1 vs. ≥ 2 ; aOR 1.61, 95% CI: 1.10–2.35) was independently associated with recent HIV infection.

Conclusions: This study shows no significant difference in the proportion of recent infections between 2004 and 2006 and suggests that young women and women at their first pregnancy are currently high-risk groups for HIV acquisition, highlighting the importance of developing targeted youth programmes to reduce the spread of HIV infection in the country.

© 2010 Elsevier B.V. All rights reserved.

Abbreviations: AI, avidity index; aOR, adjusted odds ratio; ANC, ante-natal care; ELISA, enzyme linked immunosorbent assay; MGH, Mbabane Government Hospital; NHS, national HIV serosurvey; NRL, national referral laboratory; RPR, rapid plasma reagin; STI, sexually transmitted infections.

[☆] Portions of the data presented in this manuscript have been presented as poster at the 5th European Conference on Clinical and Social Research on AIDS and Drugs in Vilnius, 28–30 April 2009 and at the 18th ISSTD in conjunction with BASHH Congress in London, 28 June–1 July 2009.

* Corresponding author at: National AIDS Center, Division of Retrovirus Infections in Developing Countries, Istituto Superiore di Sanità, V.le Regina Elena 299, 00161 Rome, Italy. Tel.: +39 06 49903249; fax: +39 06 49903002.

E-mail address: stefano.butto@iss.it (S. Buttò).

1. Background

Despite national and international efforts to curb the AIDS pandemic, HIV continues to spread at high rates in sub-Saharan Africa. WHO and UNAIDS estimate that in 2008 two thirds of the global total of 33 million people with HIV were living in sub-Saharan Africa and that an estimated 2.7 million new cases of HIV infection occurred there in that year.¹

¹ Both these authors contributed equally to the manuscript.

Thus, the broad HIV spreading is continuing to slow down progress and hard won gains in most of the sub-Saharan countries. Among these, Swaziland is one of the countries most affected by the HIV/AIDS pandemic. The HIV prevalence among pregnant women attending Ante-Natal Care (ANC) services, as measured by National HIV Serosurveys (NHS), carried out every 2 years since 1992, has steadily risen from 3.9% in 1992 to 42.6% in 2004 and 39.2% in 2006.² In addition, a Demographic and Health Survey (DHS), performed in 2006 on the general population, has shown a total prevalence of 18.8%. However, the prevalence was 31.1% among women aged 15–49 years.³ These data depicts Swaziland as the country with the highest HIV prevalence in the world.

Thus, it is important to plan strategies of prevention and control of HIV spreading, in Swaziland. This is being obtained through periodical investigations of HIV prevalence in pregnant women attending ANC, in the attempt of continuously monitoring HIV epidemic. However, HIV prevalence data alone cannot provide a complete picture of the dynamics of the epidemic^{4–6} that, instead, can be obtained by measuring the proportion of recent HIV infections occurring in a given population.

2. Objectives

The aim of this study was to evaluate, for the first time in Swaziland, the number of recent HIV infections occurring in pregnant women enrolled in the framework of the 2004 and 2006 NHS.

In addition, socio-demographic and clinical factors that are associated with recent HIV infection in the same population were evaluated.

3. Study design

3.1. Participants enrolment and samples collection

The present cross-sectional study was conducted on plasma samples from HIV positive pregnant women enrolled in the framework of 9th and 10th NHS conducted in Swaziland between August and October in 2004 and 2006, respectively.^{2,7} Women were aged 15–49 years and attended Swaziland national ANC services for the first prenatal visit.

For the NHS, 17 clinics were selected in order to be representative of the four regions of the country and of both urban and rural areas. The number of participants per site was proportional to the average number of ANC clients. The required sample size was calculated using the formula for random sampling population surveys. A total of 5131 women at first prenatal visit were selected. In particular, 2665 women were enrolled in 2004 and 2466 in 2006.^{2,7} Blood samples were collected from all women enrolled in NHS to measure the presence of anti-HIV antibodies.

In this study sera from women who were HIV positive at the HIV antibody testing were further tested to evaluate the proportion of recent infections.

At the time of enrollment of HIV positive women, an individual questionnaire was filled out by each participant in order to collect basic socio-demographic information: nationality, residence, age, level of education, marital status, and number of pregnancies. In addition, clinical data regarding syphilis serology and self-reported information on genital complaints in the previous 6 months were included in the questionnaire as indicators of sexually transmitted infections (STI).

The study was approved by Swaziland Ethics Committee and an informed consent was obtained from each woman for the questionnaire and blood collection.

3.2. Laboratory testing

All blood specimens collected from the selected clinics were sent to the National Referral Laboratory (NRL) for HIV/AIDS at the Mbabane Government Hospital (MGH) in Mbabane, for serum separation and laboratory testing. All sera were then tested for HIV antibodies and syphilis serology using standard assays.

HIV1/2 antibody testing for the NHS was done using Access ELISA (enzyme linked immunosorbent assay) from Beckman Coulter (Fullerton, CA, USA). Specimens were deemed positive for HIV if they were tested reactive by the Access method. No confirmatory testing of the HIV positive specimen was performed, following the UNAIDS/WHO recommendations for HIV surveillance in populations with a HIV prevalence higher than 10%.⁸

Syphilis antibodies were detected by a quantitative Rapid Plasma Reagin (RPR) screening test.

HIV and syphilis test results were anonymously linked to participant questionnaire by means of client identification numbers.

To identify recent HIV infections, the Avidity Index (AI) assay has been used, which was recently standardised and validated in serum samples from individuals infected with either B or non-B clade HIV-1 viruses.^{9,10} This assay was intended only for epidemiological studies and has a sensitivity of 87.9% and a specificity of 86.3%.¹⁰ The AI assay was performed on the residual of the HIV-positive sera collected during the 2004 and 2006 NHS. According to previously reported criteria for identification of recent infections, AI values ≤ 0.80 identified samples derived from individuals with recent HIV infection (≤ 6 months from seroconversion).^{9,10}

3.3. Data analysis

The proportion of recent infections was calculated as the ratio between the number of specimens from individuals with recent infection and total number of specimens tested for AI. The age and the number of pregnancies variables were categorized. In the univariate analysis, chi square test was used to assess statistically significant associations between recent HIV infection and socio-demographic/clinical characteristics, for the years 2004 and 2006, separately. In the multivariate analysis only variables with a $P < 0.10$ were included. A logistic regression model was constructed using backward elimination methods. The fit of the model was assessed using the Hosmer–Lemeshow test. Rural/urban residence and year of survey were included in the multiple logistic regression model as control variables because these characteristics were significantly associated with HIV prevalence in the NHS source database. Data were analyzed using the statistical package SPSS 17.0.

4. Results

From the 2102 total HIV-positive women identified in the 2004 and 2006 NHS, a sufficient amount of serum for AI testing was available for 1636 women. In particular, 729 sera, representing 64% of the total HIV positive samples in the 2004 NHS, and 907 sera, representing 93% of the total HIV positive samples in the 2006 NHS, were tested. The socio-demographic and clinical characteristics of the 1636 women included in the AI study were not significantly different from those of the 466 women not included in the study ($P > 0.05$). The median age of the 1636 women was 24 years (interquartile range 21–29); of these, 75% resided in a rural area and 98.8% had Swazi nationality; 51.1% reported being married or cohabiting, 22.3% was pregnant for the first time, 29.2% reported having had no education and 30.6% reported to have completed primary school education. Test for syphilis was positive in 7.5% of women. Finally, the percentage

Download English Version:

<https://daneshyari.com/en/article/3369464>

Download Persian Version:

<https://daneshyari.com/article/3369464>

[Daneshyari.com](https://daneshyari.com)