Gac Sanit. 2015;29(5):347–352

Original

Twenty years trends and socio-demographic characteristics of HIV prevalence in women giving birth in Catalonia (Spain)

Dolors Carnicer-Pont[a,b,c,*], Alexandra Montoliu[a,c], José Luis Marín[d], Jesús Almeda[e,c], Victoria González[a,c], Rafael Muñoz[a], Carmen Martínez[d], Mireia Jané[f], Jordi Casabona[a,b,c], The HIV nadó working group[1]

[a] Centre of Epidemiological Studies of HIV/AIDS and STI of Catalonia (CEEISCAT) - Catalan Institut of Oncology (ICO) - Public Health Agency of Catalonia (ASPCAT), Badalona, Spain
[b] Department of Paediatrics, Obstetrics and Gynaecology of the Autonomous University of Barcelona (UAB), Bellaterra, Spain
[c] CIBER, Epidemiology and Public Health (CIBERESP), Spain
[d] The Catalan Neonatal Early Detection Programme, Service of Biochemistry and Molecular Genetics, Hospital Clinic, Faculty of Medicine, Barcelona, Spain
[e] Research Support Unit. Primary Health Department of Costa de Ponent. ICS. IDIAP J Gol, Cornellà de Llobregat, Spain
[f] Public Health Agency of Catalonia, (ASPCAT), Barcelona, Spain

ARTICLE INFO

Article history:
Received 15 October 2014
Accepted 26 January 2015
Available online 23 March 2015

Keywords:
HIV infections
HIV seroprevalence
Pregnant women
Ethnicity and health

ABSTRACT

Background: Studies of the prevalence of HIV in sentinel populations are one of the key strategies to monitor the HIV epidemic. We describe HIV prevalence trends and identify differences across time in the sociodemographic characteristics of HIV-infected women giving birth in Catalonia.
Methods: We used dried blood specimens, residual to newborn screening, which have been collected in Catalonia every 2 months since 1994. The total number of samples obtained until 2009 and in 2013 represented half of yearly newborns. From 2010 to 2012, the total number of samples obtained represented a quarter of yearly newborns. We studied the prevalence by year and place of current residence (Barcelona-city, cities > 200,000 inhabitants and cities ≤ 200,000 inhabitants) and by the mother's birth country. A total of 624,912 infants were tested for HIV antibodies from January 1994 to December 2013.
Results: HIV prevalence trends among women giving birth in Catalonia decreased until 2007. Thereafter, there was a change to a steady trend until 2013. However, among foreign women giving birth and living in cities ≤ 200,000 inhabitants, the prevalence of HIV increased from 2007 to 2013.
Conclusion: To ensure early identification and treatment of HIV-infected mothers, it is essential to maintain HIV surveillance programs and pre- and post-natal screening programs, both in Barcelona and in cities with 200,000 inhabitants or less, especially in immigrant women.

Veinte años de seguimiento de la prevalencia del VIH y características sociodemográficas en mujeres que dan a luz en Cataluña (España)

Palabras clave:
Infecciones por VIH
Seroprevalencia de VIH
Mujeres embarazadas
Origen étnico y salud

RESUMEN

Antecedentes: Los estudios de prevalencia del VIH en poblaciones centinela son una de las estrategias clave para monitorizar la epidemia. Describimos tendencias de la prevalencia de VIH e identificamos diferencias en el tiempo y según las características socio-demográficas de las mujeres que dan a luz infectadas por el VIH en Cataluña.
Métodos: Utilizamos muestras de sangre seca, residuales al cribado de recién nacidos que se recoge cada dos meses desde el año 1994. El total de muestras obtenidas hasta el 2009 y en 2013, representa la mitad de los recién nacidos anuales. En los años 2010 a 2012, el total de muestras obtenidas representa un cuarto de los recién nacidos anuales. Estudiamos la prevalencia por año y lugar de residencia (Barcelona-ciudad, ciudades de más de 200.000 habitantes y otras ciudades o pueblos de ≤ a 200.000 habitantes) y por lugar de nacimiento de la madre. Entre enero 1994 y diciembre 2013, fueron cribados de existencia de anticuerpos anti-VIH 624.912 recién nacidos.
Resultados: La prevalencia de VIH en las mujeres que dan a luz en Cataluña decrece hasta el año 2007, estabilizándose en 2013. Sin embargo, entre las extranjeras que dieron a luz y que viven en ciudades de ≤ a 200.000 habitantes la prevalencia de VIH aumenta entre 2007 y 2013.
Conclusión: Es fundamental mantener la vigilancia del VIH y los programas pre y post natal en Barcelona ciudad y ciudades de ≤ a 200.000 habitantes, y especialmente en las mujeres extranjeras para asegurar un temprano abordaje de las infectadas por el VIH.

* Corresponding author.
E-mail address: dcarnice@gmail.com (D. Carnicer-Pont).
[1] The HIV nadó working group listed at the end.

http://dx.doi.org/10.1016/j.gaceta.2015.01.012
0213-9111/

Introduction

Studies in sentinel populations to estimate HIV prevalence are the key strategies to monitor the epidemic [1]. Pregnant women are an important group to target for HIV prevention as early diagnosis and appropriate management reduces mother to child transmission. Monitoring HIV prevalence in this group has been done using different methods such as back projection from reported cases of AIDS due to perinatally acquired HIV infection [2] or unlinked anonymous surveillance [3–7] or testing programs in antenatal care or abortion clinics [8].

In Catalonia, estimations of pregnant women's HIV prevalence cannot be done from information collected in antenatal care or abortion clinics because the standard HIV surveillance questionnaire doesn't ask about pregnancy status. Unlinked anonymous testing was introduced in the Integrated Surveillance System of HIV/AIDS/STI of the Health Department (Generalitat de Catalunya) in 1994, as a way to monitorize HIV prevalence with the minimum participation bias, in key populations. Originally, Intravenous Drug Users, Men who have Sex with Men and Female Sex Workers were chosen as high risk populations. Since the offering of an HIV test to all pregnant women was mandatory in the local protocol, and since a newborn metabolic screening program was in place with a very high coverage (99%), newborns were also included as a sentinel population to estimate HIV prevalence among pregnant women. The unlinked anonymous newborn survey has provided information on HIV prevalence by area of residence since 1994 and by country of origin since 2007 and now includes approximately 50% of live births in Catalonia. The survey includes women whose HIV infection has already been diagnosed as well as those unaware of their infection, giving a measure of overall HIV prevalence in pregnant women.

The increase of immigration occurred in Spain and Catalonia within the last 20 years with a steady trend of migrants since the year 2009. The pattern of migration of women 15 to 64 years old is similar, both in big and small cities, increasing up to 2009 and stable after then. Percentages of migrant women are the highest in Barcelona, followed by 4 cities > 200,000 (Badalona, Hospitalet de Llobregat, Terrassa and Sabadell) and cities ≤ 200,000 inhabitants.

According to these data, it is meaningful to study the HIV prevalence by mother's country of birth and place of current residence. Other researchers have studied serological markers of HIV and other infections in Spain [9,10]. The study of the geographic distribution of HIV prevalence in women giving birth may be an additional tool to help targeting geographic areas for intervention. Although ecological studies are not conclusive [11], taking profit of data already available helps reducing costs and better targeting for further studies. The aim of this study was to describe HIV prevalence trends in women giving birth and identify differences on their socio-demographic characteristics by place of current residence in Catalonia during a 20 years period (1994 to 2013) as well as describe the potential role of immigration more specifically for the period 2007 to 2013.

Methods

Collection of samples

The neonatal dried blood spot survey, residual to newborn screening [12], takes left over dried blood spots taken from newborn 3 days after birth and tests them for maternal HIV infection. These blood specimens are being collected, in order to avoid seasonality, every two months. The obtained sample size represents half of the yearly newborns up to the year 2009 and also for the year 2013. Samples from 2009 to 2012 represent only a quarter of the yearly new born [13] in Catalonia. All samples are irreversibly unlinked and anonymized prior to HIV testing. Anonymity was guaranteed by using a computer-aided coding process at the Neonatal Early Detection Program therefore, the results of HIV antibody testing can't be linked with any patient identification number. Regional distribution of yearly samples within Catalonia is proportional to regional birth rate.

Variables

Variables collected in the study were: HIV results from testing new born as a surrogate of HIV status of the mother (100% completion), age (100% completion), mother's country or region of birth (from 2007) (>95% completion) and mother's place of current residence (99.6% completion). In order to allow comparisons we established three categories of mother's place of current residence: Barcelona city, cities >200,000 (Hospitalet de Llobregat, Terrassa, Sabadell and Badalona) and cities or towns ≤ 200,000 inhabitants.

Mother's country or region of birth was grouped into Latin America, Sub-Saharan Africa, Spain and rest of the world.

As background information, population data by country of birth were collected from the Annual statistical report of Catalonia. Catalan Institute of Statistics[13] and classified according to populations' origin (Spanish and foreign born) and grouped by categories used to study mother's place of current residence: Barcelona city (more than 1.5 million inhabitants), cities > 200,000 and cities or towns ≤ 200,000 inhabitants.

Laboratory methods

Two drops of blood were collected on filter paper discs (Schleicher and Schuell no. 903TM, Dassel, Germany) and stored at 4 °C until used. HIV antibodies were determined using a modified Serodia IgG antibody-capture particle agglutination test for HIV-1 (Fujirebio Diagnostics) [14]. Positive samples were sent to the Microbiological Service of the University Hospital Germans Trias I Pujol to confirm the results using an IgG antibody capture ELISA for HIV-1 and HIV-2. Until 2001 this was done using the GACELISA test (Murex, UK) [15]. In 2002 up to 2006, this confirmatory test was replaced with the Pasteur HIV-1/2 GenElavia Mixt ELISA (BioRad, Spain) after checking that normal and external valid values were similar for both tests [16]. From 2007 to 2009, the test used was BED-CEIA Assay (Calypte Biomedical Inc, Portland, OR, USA) and from 2010 until nowadays, Vitros HIV1 + 2 Reagent (Ortho Clinical Diagnostics Inc, Cardiff, Wales, UK) is the test used. The surveys are conducted in collaboration with the Catalan Neonatal Early Detection Programme, Service of Biochemistry and Molecular Genetics, Hospital Clinic, Faculty of Medicine, Barcelona, Spain, as well as with the Microbiology Laboratory of the Hospital Germans Trias i Pujol, where reactive samples are confirmed.

Statistical analysis

The annual HIV prevalence among women giving birth was computed as the number of HIV-positive samples divided by the total number of HIV-positive and HIV-negative samples tested each year. Confidence intervals for proportions were calculated by using the Clopper and Pearson method. The Cochran-Armitage test was used as a test for trends of proportions with a 0.05 significance level. Statistical comparisons of prevalence between country or region of birth were performed using chi-squared analysis and Fisher's exact test.