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Epidemiological surveillance of congenital syphilis in Spain, 2000-2010

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Pediatr Infect Dis J. 2012 Sep;31(9):988-90

which has been published in final form at

<https://doi.org/10.1097/INF.0b013e31825d3152>

Title: Epidemiological surveillance of congenital syphilis in Spain, 2000-2010

Abbreviated title: Surveillance of congenital syphilis in Spain, 2000-2010

Running head: Congenital syphilis in Spain

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Key Words: congenital syphilis, antenatal care, sexually transmitted infections, prevention.

Disclosures: The authors have no conflicts of interest or funding to disclose

Financial support: This work was funded by a grant from Instituto de Salud Carlos III (Ref. EPY 1352/10) to A.D.

ABSTRACT

The characteristics of 67 confirmed congenital syphilis cases reported to the surveillance system in Spain (2000-2010) were analysed. The incidence rates ranged from 0.00 to 2.23 per 100,000 live births. Median age at diagnosis was four days. Hepatosplenomegaly was the most common clinical finding, although almost 60% of the cases were asymptomatic. Missed opportunities for congenital syphilis prevention through antenatal care were identified.

INTRODUCTION

Congenital syphilis (CS) is a severe condition caused by mother-to-child transmission of the bacterium *Treponema pallidum*.

Without treatment, syphilis during pregnancy can result in stillbirth, premature birth or neonatal death in 50%-80% of cases (1). However, CS is preventable through antenatal screening of pregnant women and treatment of those infected, a strategy found to be highly cost-effective (2).

The World Health Organization (WHO) estimates the number of annual cases worldwide to be between 728,000 and 1,528,000, with Africa and Central/South America the most affected regions (1). In the United States, recent data show an increase in the CS rate from 8.2 cases per 100,000 live births in 2005 to 10.1 in 2008 (3).

In the European Union and the European Economic Area (EU/EEA), 101 cases of CS were notified in 23 countries in 2009, producing an overall rate of 3.5/100,000 live births, but not all countries belonging to this area consider CS to be a notifiable disease (4). In an active search carried out from 1997 to 2008 in two independent data sources in the Netherlands, one of the EU/EEA countries where CS is not notifiable, between 18 and 36 CS cases, depending on the source, were identified (5); these findings suggest that the true burden of the disease in the EU/EEA is unknown.

In 2007, WHO launched a global initiative for the elimination of CS. The specific goal of this initiative was to prevent mother-to-child transmission of *T. pallidum*, which requires improved access to antenatal care, well-structured clinical pathways and enhanced surveillance (1).

In Spain, CS has been a notifiable disease since 1997. This paper aims to describe epidemiological and clinical features of CS cases reported from 2000 to 2010.

MATERIALS AND METHODS

Data analysed in this paper were obtained through the CS Surveillance System implemented in Spain since 1997. All confirmed cases reported from 2000 to 2010 were included; cases notified earlier were excluded because the surveillance system was not fully implemented until 2000. A confirmed case was defined according to the European case definition (6), which requires laboratory confirmation, and includes cases occurring in children under two years of age, i.e., early congenital syphilis; stillbirths are not included.

In Spain, surveillance of CS is mandatory countrywide. Any physician who diagnoses a case is obliged to notify it to the health authorities of the autonomous regions, who in turn send the data to the central level. The notification is case-based and a set of epidemiological and clinical variables from the infants (sex, age at diagnosis, country of birth, signs/symptoms, date of death) and their mothers (age at delivery, country of birth, access to antenatal care, HIV status, drug use) is collected for each case on a surveillance form.

Frequency distributions of qualitative variables were performed and the median and interquartile range (IQR) were calculated for quantitative variables. The Chi-squared test was used to compare proportions while the U Mann-Whitney test was used to compare medians. CS rates per 100,000 live births were calculated using as the denominator the annual number of births in Spain published by the Spanish National Institute of Statistics. To evaluate trends in incidence a joinpoint regression model was fitted.

RESULTS

In total, 67 early CS cases were notified during the study period, giving an overall incidence rate of 1.32 cases per 100,000 live births. The number of cases by year varied from 0 in 2003 to eleven in 2007, and the reported incidence rates ranged from 0.00 per 100,000 live births to 2.23 in the same years. To evaluate trends, a joinpoint regression model was fitted that showed no statistically significant trend in incidence (Figure 1).

Of the total cases, 34 (50.7%) were male, and the median age at diagnosis was 4 days (IQR: 1-28) without significant differences between sexes. Three cases (4.5%) were born outside Spain (two were adopted children born in Latin America and Africa, respectively, and another child was born in Romania before his parent moved to Spain).

Regarding clinical findings, 39 infants (58.2%) were asymptomatic. Of the 28 symptomatic cases, 12 (42.9%) presented hepatosplenomegaly, eight (28.6%)

skin lesions, six (21.4%) bone abnormalities, and six (21.4%) anemia and/or malnutrition; less frequent findings were renal disease (four cases), low birth weight/premature delivery (three cases) and meningitis (one case). One case diagnosed in 2008 died when he was 11-days old.

In total, 66 mothers were identified because two cases were twins. Fifteen mothers (22.7%) were born outside Spain: six in Eastern Europe, four in Latin America and two in Northern Africa; the remaining three were known to be foreigners, but their country of birth was unknown. Data on age at delivery was available in 34 women (51.5%); among these, median age at delivery was 26 years (IRQ: 23-32), with no differences between Spaniards and migrants. Two mothers had HIV infection, and five reported drug problems, three of whom were intravenous drug users.

Information on antenatal care was reported in only 36 women (54.5%): uncontrolled pregnancy was reported in five cases; a maternal syphilis case was diagnosed at delivery; two mothers refused syphilis treatment; three women diagnosed with syphilis did not receive treatment for unknown reasons; 19 women were diagnosed with syphilis during pregnancy, but whether they received treatment was not documented; and six women were adequately screened and treated for syphilis. No statistical difference was observed in antenatal care by the mother's place of birth.

DISCUSSION

This is the first study that analyses epidemiological and clinical data on early CS cases reported to the surveillance system in Spain, providing information on the last 11 years. The findings are useful to know the magnitude of the problem and the characteristics of the cases, and highlight missed opportunities for CS prevention through antenatal care in Spain.

This study had several limitations. Firstly, stillbirths and neonatal deaths were not included, therefore the incidence could be underestimated; however, because the European case definition (6) was used, a similar situation exists in other European countries. Secondly, the underreporting rate is unknown, although the system is implemented countrywide and to our knowledge selections bias due to underreporting is unlikely. Finally, there was an important proportion of missing information for some variables.

The incidence rates of CS for 2000-2010 in Spain were lower than the overall rates notified in the EU/EEA, which ranged from 1.7 to 4.1 per 100,000 live births in the same period. Compared with individual countries, the figures reported in this study are similar to those found in the United Kingdom and Italy and higher than those notified in Germany and Sweden in the same period, although the surveillance systems are different (4).

Previous findings from the United States and France have described an increase of CS parallel to a rise of syphilis rates among women (3, 7). In Spain, nationwide surveillance data on syphilis showed an important upward trend in

reported rates between 2000 and 2009 (from 1.8 to 5.4 cases per 100,000 population), but, unfortunately, information on the cases' sex is not currently collected (4); nevertheless, data provided by a sentinel surveillance system based on sexually transmitted infections clinics shows that men who have sex with men are the group most commonly affected by syphilis (8).

The clinical manifestations and percentage of asymptomatic cases in our data were similar to those described in previous studies (9). The variety of clinical findings and the high proportion of asymptomatic CS cases make diagnosis difficult unless there is high diagnostic suspicion; this is particularly relevant when the mother's syphilis status is unknown, as may occur when the children are adopted (7).

The delay or absence of antenatal care, inadequate or inexistent treatment, and the acquisition of syphilis during pregnancy have all been described as factors related to CS. These situations occur not only in developing world settings but also in countries, such as Italy, France and the United Kingdom, where maternal syphilis screening is widely implemented (7, 10, 11).

In Spain, screening is provided free of charge to all pregnant women, including illegal migrants; antenatal care guidelines recommend universal screening in the first trimester and re-screening in the third trimester for women belonging to high-risk groups (12). In a study carried out in 2000 in Spain (13), coverage of syphilis screening in public hospitals was found to be 95.8%, a figure similar to the 96.6% reported for the same setting in 2007 in the United Kingdom (14). However, our results show clear failures in access to and delivery of antenatal

care; these findings have also been reported by other authors (15, 16) and warrant further research on coverage of and barriers to antenatal care in Spain.

Migrants and drug users usually experience problems in obtaining adequate health care. A study in France found that migrant mothers had difficulties accessing health care and adhering to medical recommendations (7). In our study a considerable proportion of mothers were born outside Spain, but unfortunately information on the reasons for not receiving adequate antenatal care was lacking.

Regarding drug use, an overrepresentation of mothers with drug problems was noticed in our data; the same finding has been reported in another study in Spain, which points to the social vulnerability of this group (16).

The study results are very useful to guide policy in relation to CS in Spain, and they have several public health implications: a) it is necessary to improve the quality of data collected for the epidemiological surveillance of CS; b) although data on antenatal care are not requested at a European level, this information is highly relevant to improve CS prevention at national level; c) enhancement of doctors' awareness of the persistence of maternal and congenital syphilis in our setting is necessary to improve early diagnosis and treatment; d) actions to eliminate barriers to antenatal care in marginalized groups should be implemented.

ACKNOWLEDGEMENTS

The authors are grateful to the clinicians and public health staff at regional level for their cooperation. We thank Victor Flores and Silvia Galindo for statistical support.

POTENTIAL CONFLICTS OF INTEREST:

The authors do not have a commercial or other association that might pose a conflict of interest.

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Figure 1. Incidence of congenital syphilis (number of cases and rate per 100,000 live births), by year of diagnosis. Spain, 2000-2010

