

Surveillance and outbreak reports

REPORTED CASES OF CONGENITAL SYPHILIS IN THE FRENCH NATIONAL HOSPITAL DATABASE

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In France, the resurgence of syphilis infection since the beginning of the 2000s, with cases reported among women of reproductive age is a reason for concern considering the possible occurrence of congenital syphilis (CS). Using the French national private and public hospital database, we investigated the number of children with a diagnosis of CS born in France in 2004. Six cases less than one year old were identified as probable CS in the database. Two of these cases were adopted children from outside Europe, whereas the other four were born in France. The mothers of these last four infants tested positive for syphilis during the third trimester of pregnancy, two of them during premature delivery. Three of the four mothers were born abroad. Specific socio-cultural conditions may have been responsible for a lack of antenatal care responsible for the disease. Since CS is a preventable disease and the treatment of syphilis infection is cost-effective, we conclude that surveillance of CS cases and assessment of syphilis screening practises during pregnancy should be performed to prevent the occurrence of CS cases in France.

Introduction

Because of the availability of cost-effective treatment and better prevention of sexually transmitted infections (STI) following the emergence of HIV in the 1980s, syphilis infection had almost disappeared in western European countries by the end of the 90s [1-5]. However, since 2000, France as well as other western European countries has been facing an increasing number of syphilis cases especially among men who have sex with men (MSM), although heterosexual transmissions affecting an increasing number of women are reported too [6,7]. Neither syphilis infection nor congenital syphilis (CS) is notifiable in France. The surveillance of syphilis is based on voluntary notifications by clinicians working in STI health centres, and the burden of the disease in the general population is by consequence underestimated.

Syphilis infection among women of reproductive age can lead to CS in their children. In France, syphilis screening is mandatory and free of charge during the first trimester of pregnancy. However, in specific circumstances, pregnant women may miss antenatal care and by consequence pose a higher risk of CS for the infant due to the lack of appropriate treatment during pregnancy [8,9].

We used the national public and private hospital database, which includes information on all hospitalisations with a specific diagnosis associated to each stay, to assess the number of children with a diagnosis of CS born in France in 2004. We also attempted to identify maternal characteristics associated with the risk of CS.

Methods

Study design and population

We performed a retrospective cross sectional study of CS cases recorded in 2004 in the French national private and public hospital healthcare information system [Programme de Médicalisation des Systèmes d'Information (PMSI) implemented since 1999]. This database includes information on all the diagnoses made for all the patients admitted to French hospitals. Medical doctors register all hospital stays with a principal and associated diagnosis coded according to the 10th edition of the International Classification of Diseases (ICD-10) [10]. All data contained in the database are anonymous and protected by professional confidentiality.

In our study, information on hospital stays in 2004 of patients less than one year old with a principal or associated diagnosis of CS (Table 1) were extracted from the PMSI database. As some patients may have stayed in hospital several times, a unique identification number per patient in each hospital allowed us to identify all the stays related to the same patient.

Data collection

For each diagnosis of CS identified in the PMSI database, we contacted the hospital where the patient had stayed and asked the head of the medical informatics department to collect the following information from the patient's medical records: sex, age, date of stay, clinical symptoms, serology of syphilis and place of birth of the infant and term of the pregnancy, screening of the

TABLE 1

Codes based on the 10th edition of International Classification of Diseases (ICD-10) used for initial extraction of data on cases with diagnosis of congenital syphilis from the national hospital information system, France, 2004

| Diagnosis | Code |
|--|-------|
| Early congenital syphilis, symptomatic | A50.0 |
| Early congenital syphilis, latent | A50.1 |
| Early congenital syphilis, unspecified | A50.2 |
| Late congenital syphilis oculopathy | A50.3 |
| Late congenital neurosyphilis (juvenile neurosyphilis) | A50.4 |
| Other late congenital syphilis, symptomatic | A50.5 |
| Late congenital syphilis, latent | A50.6 |
| Late congenital syphilis, unspecified | A50.7 |
| Congenital syphilis, unspecified | A50.9 |

mother for syphilis during pregnancy, date of screening, antenatal care and treatment received for syphilis during pregnancy, and mother's place of birth. Based on these data, cases were confirmed as definite or probable early CS according to the case definition.

Results

A total of 1,811 hospital stays were recorded with a diagnosis of syphilis in the PMSI database in 2004. In 113 of these CS appeared among the diagnoses coded, but only 19 hospital stays had the principal or associated diagnosis of CS. These 19 stays corresponded to 16 infants, as four stays were linked to the same patient (Figure). No medical record could be located for two patients. In three cases coding error occurred; the principal diagnosis coded was different than the principal diagnosis mentioned in the medical records. Five patients did not fulfil the case definition and were excluded.

Among the remaining six infants classified as probable cases of CS, two were adopted babies born in North Africa. The remaining four cases were born in France, two of them prematurely, including

one with foetal hepatomegaly (Table 2). The mothers of these four cases were screened positive for syphilis during their third trimester of pregnancy two of them at the premature delivery. They had not received proper treatment for syphilis infection: two were not treated at all, one received only two doses of extencillin (benzathine benzyl penicillin), and the last one received three doses but starting less than 30 days before delivery. No information on syphilis screening during the first trimester of pregnancy was available for any of these four women. Additional information on social integration difficulties and undesired pregnancy was mentioned in the medical documentation of two mothers.

Discussion

This original study is the first documentation of CS occurrence in France. We identified six probable early CS cases less than one year of age according to the CDC definition. None of them were confirmed CS that would have required laboratory confirmation with evidence of *Treponema pallidum* [11]. Among these six probable cases, two adopted infants were born outside Europe, in North Africa. Only four probable CS cases born in France were identified in the PMSI database in 2004. The CS diagnosis was made at birth for all of them. Syphilis infection among the mothers was detected or treated too late to prevent the infection in the infant.

This number may have been underestimated. Indeed, CS can occur with non-specific symptoms, or the infection can be asymptomatic at birth and the diagnosis is by consequence delayed. Among the nine children with CS reported between 1994 and 1997 in the United Kingdom [12], only three had clinical abnormalities. In our study, one of the four cases born in France had obvious clinical symptoms. Our study focused on early CS in children less than one year of age but the diagnosis of CS can be made in older children ("early" CS defined as affecting children less than two years old and "late" CS diagnosed in children older than two years). In the PMSI database, a two-year-old child and eight children aged between two and 15 years were reported with a principal or associated diagnosis of CS in 2004. These cases were not

FIGURE

Congenital syphilis (CS) cases identified in the PMSI database, France, 2004

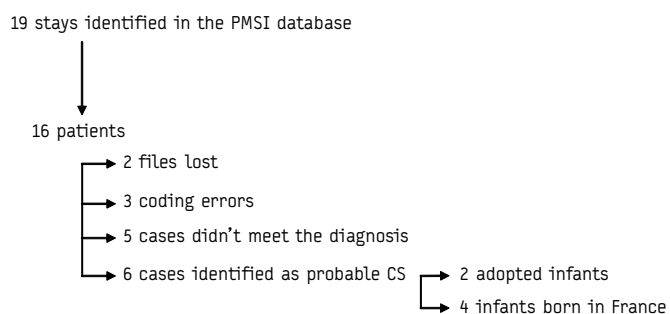


TABLE 2

Probable cases of congenital syphilis (CS) less than one year of age born in France identified in the PMSI database in 2004, France

| Cases | Age | Sex | Congenital syphilis diagnosis: serologic tests and others investigations | Syphilis screening during pregnancy | Treatment of the mother during pregnancy | Place of birth of the mother |
|-------|---|--------|---|---|--|-------------------------------------|
| 1 | Newborn (reached term) | Male | +TPHA/VDRL** | +TPHA/VDRL | Two doses of extencillin given at one week intervals before delivery (at term) | East Europe |
| 2 | Premature (33 WA*) | Male | +TPHA/VDRL; +Fta-IgM | First prenatal consultation at 29 WA* with +TPHA/VDRL; undesired pregnancy | Three doses of extencillin given at one week intervals | South Europe |
| 3 | Premature (32 WA*) | Female | Foetal hepatomegaly; +TPHA/VDRL | Threat of premature delivery with admission to hospital and +TPHA/VDRL during the third trimester; pregnancy followed up by a general practitioner; no information on syphilis screening during the first trimester | Never treated | Outside Europe |
| 4 | Diagnosis made at birth (unknown week of amenorrhoea) | Male | No clinical symptoms; two reactive +TPHA/VDRL at one week intervals; second titration higher than the first | +TPHA/VDRL at delivery; difficulties with social integration | Refused treatment | Overseas French district in America |

* Week of amenorrhoea

**Treponemal test: *Treponema pallidum* hemagglutination test (TPHA) / venereal disease research laboratory (VDRL)

investigated. Finally, coding errors may have occurred, and cases who had never been hospitalised were missed. Also, miscarriages and cases of stillbirth due to CS were not included in the study.

Previous studies showed that CS occurs more frequently in absence of or inappropriate antenatal care [13,14]. The consequence is a late or no syphilis screening and inappropriate treatment of the mothers which fail to prevent foetal contamination [15,16]. In France, a pregnant woman should attend seven antenatal consultations, and syphilis screening must be performed during the first trimester (Décret n°92-143) [17]. Antenatal care is free of charge, the syphilis screening included. However, despite this regulation, different factors such as language and cultural barriers or an illegal administrative status can hinder pregnant women from getting appropriate medical care [8,9]. In our study, specific socio-cultural conditions may have been responsible for the lack of antenatal care: three mothers were migrants and “social integration difficulties” (but no details) were reported for the fourth one. The fact that one mother refused the treatment and one had an undesired pregnancy may be indicative of further psychosocial problems [18].

In France, like in the other western European countries, the re-emergence of syphilis especially affects MSM [6]. However, the number of infected women also increased from 11 (of the total of 207 cases of syphilis reported) in 2001 to 30 (total of 455 cases) in 2006 [6]. The contagiousness of syphilis as well as the high percentage of heterosexuals who engage in high risk sexual behaviours, such as not using condoms for oral sex (92% heterosexuals in France), may be responsible for an increasing number of syphilis cases among women. Immigrant women were identified to be at a higher risk of syphilis infection during pregnancy [19]. In France, among the 19 women with a diagnosis of syphilis notified in 2004, 13 were born in foreign countries and four were born in France (information unavailable for the remaining two women). In this context, health care practitioners should consider the option of syphilis screening at each pregnancy consultation [20,21], especially in the presence of risk factors identified above. Indeed, the French National Authority for Health (Haute Autorité de Santé - HAS) recommends another syphilis screening performed before 28 weeks of gestation when the woman or her partner has high risk sexual behaviour. Finally, a lack of syphilis screening during pregnancy should result in performing serology at birth to avoid late diagnosis of CS [21].

Despite their limits, data from PMSI can be used to describe the annual trend of CS cases, but not to perform a prospective follow up as the data are available with a minimum delay of three years. In France, the very low number of CS cases suggests that the antenatal care system is efficient. However, because of the overall increasing incidence of syphilis infection the French gynaecologists, obstetricians and paediatricians should be aware of the risk of CS, especially among women belonging to specific under-privileged groups, and should double check at delivery whether and how the screening was performed during pregnancy. A prospective notification of CS cases by maternity or paediatric wards with an investigation of each case should allow to better characterise the circumstances of syphilis infection before or during pregnancy and the performance or the absence of syphilis screening. These information may improve the prevention and the treatment of CS in the population at risk. This strategy is necessary taking into consideration the severity and the burden of CS avoidable with a simple cost effective treatment.

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