

## ORIGINAL ARTICLE

# AN INCREASE IN THE PREVALENCE OF SYPHILIS IN WOMEN IN THE EASTERN BOHEMIA - 30 YEARS OF SURVEILLANCE

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### Summary

The epidemiology of sexually transmitted infections in the Czech Republic has been carefully reported for many years. Here we present an analysis of regional data on syphilis spanning more than 30 years in eastern Bohemia. The epidemiological data were collected by the mandatory reporting of sexually transmitted disorders during the period 1981-2011. The data showed a minimal incidence of the cases in 1990 and an increasing trend thereafter. Two peaks in the incidence are apparent - within years 1995-1999 and 2003-2007. Interestingly, while before 1990 the numbers of positive men always exceeded those of women, within those two peaks these numbers equalize, or those of women even exceed the positive men. The results reflect trends in the changes within the society after 1989. The analysis shows that the regional prevalence of syphilis in the eastern Bohemia still remains at low level compared to some other regions in the Czech Republic.

*Key words: syphilis; Czech Republic; epidemiology*

### THE STUDY

Syphilis is a sexually transmitted infection (STI) caused by the bacterium *Treponema pallidum*. The disease has a long history and has been affecting humans for centuries. The exact origin of the disease

has not still been determined. It is a disease, which has never been eradicated since the first epidemics in Europe in the end of 15th century [1]. Syphilis is passed from person to person through direct contact with syphilis sore. Sores occur mainly on the external genitals but one should never underestimate the possibility of extra genital lesions. Transmission of the bacteria occurs during sexual intercourse and results in the development of disease, which could be clinically classified into different stages in untreated patients. Every clinical stage is characterized by different symptoms and different levels of infectivity. The disease has often been called "the great imitator"

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because so many of the signs and symptoms are indistinguishable from those of other diseases [2, 3]. The disease represents a major public health issue due to the financial impact of patient and partner management, and also costs associated with potential congenital disease. The disease also exhibits tremendous long-term consequences with multi-system involvement [1].

The discovery of penicillin in the 20<sup>th</sup> century brought a definitive cure for the first time. Syphilis is easy to cure in its early stages. However, there is not a unified guideline for the treatment of syphilis worldwide. Despite some efforts to develop such system, currently many national treatment guidelines with some differences are used in various countries [4, 5].

With the existence of an effective treatment the necessity to screen for syphilis on an on-going basis in cases of all suspected STI patients is ever more important. In addition, proper education of patients with syphilis is necessary to assure, that the patients must both abstain from sexual contact until healing and notify their sex partners so that they also can be tested and receive a treatment if necessary [6, 7]. The thorough and widely accessible treatment leads to the prevention of further transmission of the disease.

Syphilis should be regarded as a “pay attention” disease. Despite the absence of late clinical stages and its consequences due to the early diagnosis and effective treatment in many developed countries syphilis and other sexually transmitted diseases (manifested with genital ulcer) increase the risk

of HIV/AIDS [8]. Furthermore, the *Treponema pallidum* infection can lead to the congenital infection of the fetus during pregnancy, which may result in serious malformations or death and substantially influence the perinatal morbidity. Diagnosis of congenital syphilis represents a failure of preventive health care system and points to the unavailable or insufficient prenatal care [7]. The risk of other sexually transmitted infections represents an additional economic problem and serves as public health marker.

Every individual case of syphilis should be evaluated as a potential source of an epidemic. Syphilis is not an isolated disease, but always indicates transmission of infection between sexual partners and risk of subsequent transmissions. Disease control mechanisms should focus on medical, social, risk-evaluating and sexual behaviour factors. Diagnosis, therapy and follow-up care are carried out by qualified physicians and other health workers. The epidemiological evaluation is an integral part of the complex care, however, in the real settings such analysis is complex and time consuming.

The Czech Republic has developed a thorough system of syphilis reporting and the data have been carefully evaluated for many years [9]. Country-wide, regional and county-wide data are analyzed regularly. This paper is focused on the epidemiological analysis of syphilis during the years 1981–2011 in east Bohemia, within the area of East Bohemian region (until 1999) and the Kralovehradecky region established in 2001 within the corresponding geographical area.

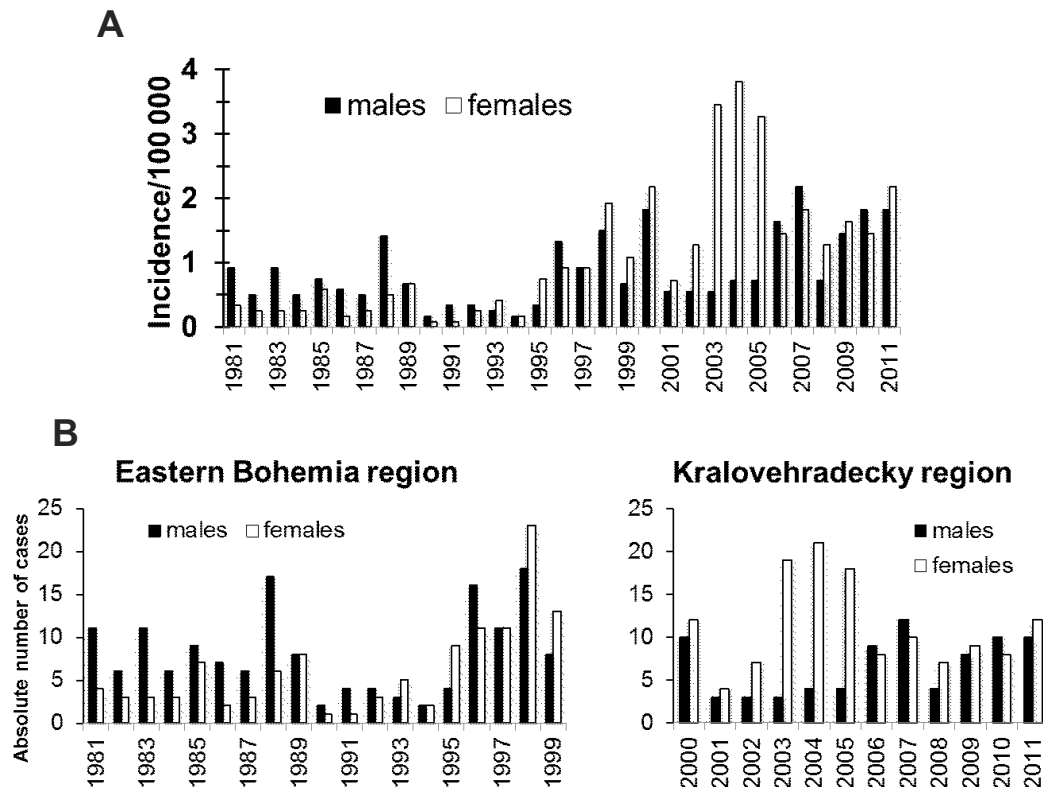


**Figure 1.** Map of the newly constituted Kralovehradecky region (since 2001). Kralovehradecky, Pardubicky region and part of Liberecky region constituted East Bohemian region until the year 2000 (shaded area).

Data on reported cases of syphilis and other case characteristics were collected within a program of mandatory tracing of syphilis source and contacts, which had been carried out in all the country regions as a regular component of guidelines recommended by the Czech Society of Dermatology and Venereology. The data were anonymized due to its sensitivity and are accessible only for 4 categories of health professionals - attending physician, nurse, nurse specialized in follow-up care (including contacts tracing) and authorized physicians of state supervision (surveillance). The demographic characteristics of the regions included in the study are as follows: The East Bohemian region consisted in the year 2000 of 11 counties with a total of 1 231 459 inhabitants, 631 000 of whom were women (51%) and 308 000 women in the age 15-49.

In the year 2001 a new redistricting of the country was carried out and the newly created Kralovehradecky region (Figure 1) encompassed about half of the former East Bohemia with 554 000 inhabitants in 5 counties, 51% of whom were women.

Within the entire period of the study, a total of 486 persons were reported to the surveillance system as positive for syphilis. Out of these, 233 were men (47,94%) and 253 women (52,06%). A total of 86 persons (17,69%) were foreign nationals. Detailed data for the individual years are shown in Figure 2. While before the "absolute" minimum of positive cases for the entire period in 1990 the positivity of men always exceeded that of women, after this the number of positive women shows increasing trends.



**Figure 2.** The analysis of the epidemiological data on syphilis in the eastern Bohemia. A) Morbidity per 100 000 inhabitants and B) Absolute number of cases.

Interestingly, we can see two "peaks" - one during the period of 1995-1999 and the second one in 2003-2006. Especially during the latter, the numbers of positive women greatly exceed those of men. The first peak was associated with the detection

of 3 cases of congenital syphilis in the period 1998-1999. This form was rarely diagnosed in the entire country before 1989 and was not reported in the eastern Bohemia for the preceding 25 years. A total of 35 women (7,20%) were diagnosed

positive during pregnancy. The majority of recorded syphilis cases represent primary, secondary and early latency cases. Late syphilis is an extraordinarily sporadic diagnosis in the Czech Republic. However, the second peak of incidence with the predominance of women cases was very likely driven by positive cases of foreign nationals, majority of whom presented during the late latent phase of disease [9].

There were never significant differences in age distribution in the East Bohemian region and in the Czech Republic during the first part of the study (until 2000). The peak incidence of syphilis according to age was between 20-39 years for both men and in women. However, during the second part (after the "redistricting" and creation of Kralovehradecky region in 2001) there was a significant difference within the peak period of 2003-2006, where in our region the predominance of positive women was reported, contrary to the data for the entire country.

The age distribution of syphilis recorded in Kralovehradecky region (since 2000 year until 2011) was as follows: the most frequently reported cases were in the age group between 20-39 years. During the period 2002-2004, late latent forms were predominantly recorded in the age group 60 +. In the years 2009 and 2010 there was an increase of positive cases in the age group 15-19 years with early forms of syphilis. Adolescents and young adults are believed to be at higher risk for STI's during their premarital years because they are more likely to have multiple sexual partners, they often engage in high risk behaviours, and select higher risk partners.

Although the declining male to female rate ratio suggests a disproportionate increase in rates of syphilis among women, the causes for this trend remain unclear. Prostitution may play a role, however, other factors must be considered. Female cases may be identified and reported more efficiently by numerous STI programs focused on high-risk populations. Declines in long-term monogamous relationships may also have occurred and resulted in the increased risk of infection.

After 1989, with the fall of „iron curtain“, the migration parameters have dramatically increased leading to an increased numbers of foreign residents within the area. In the beginning of the year 2009 there were more than 16 000 foreign residents in the region with a majority of Ukrainian, Polish and Slovak nationality. Residents from some countries

(particularly former USSR) contribute to the reported cases of sexually transmitted infections in the Czech Republic with significantly increasing rate.

Comparing our region to the country-wide data from Czech Republic, there are significant differences in recorded cases of syphilis. From 14 newly constituted regions, the Kralovehradecky region with some other 3-4 regions reports the lowest recorded case numbers - e.g. incidence of syphilis 3,9 per 100.000 inhabitants in region versus 9,6 for the Czech Republic in 2003 (Institute for Health Information and Statistics, Czech Republic).

Syphilis is not an eradicated entity and there are countries recording an increase in morbidity. Unfortunately, even in the Czech Republic not only there was a slight increase in acquired syphilis cases reported, but also cases of congenital syphilis appeared in our region during the years 1998-1999 after many decades.

Congenital syphilis is the most serious outcome of syphilis in women and it can be speculated that its increase is connected to the increase of acquired syphilis in women during this period. Control programs currently in use include prenatal care with two serological screening tests (RPR or VDRL and TPHA tests) during pregnancy, which are performed in the late first and early third trimester. Thus there is a very low incidence of mothers arriving for delivery with evidence of untreated or inadequately treated syphilis. Such cases of congenital syphilis may predominantly be based on problems specifically associated with epidemiology of STIs, particularly with prostitution and so-called sex industry development. Local authorities also speculate that they are also associated with socioeconomic factors in patients from certain socioeconomic groups. High rates of both acquired and congenital syphilis cases are recorded in large agglomerations and in urban areas (such as the capital Prague) and in regions with high rate of prostitution, such as areas along borders - Ustecky region, some counties of Jihocesky, Zapadocesky and Moravskoslezsky regions. Interestingly however, while the neighbouring countries, such as Germany, also show increases in syphilis cases, the predominant group driving this trend are men-who have sex with men [10], who would presumably not target the population of female prostitutes across the border.

Low level of „disease and risk awareness“ as well as inconsistent adherence to safe sex practice were

also recorded in the Czech Republic, which manifest in a dramatic increase of HIV positivity in last few years.

In other countries, such as China, the incidence of syphilis increased from 0,2 to 6,5 cases per 100 000 inhabitants in the years 1993–1999. The incidence of congenital syphilis increased from 0,01 to 19,68 cases per 100 000 inhabitants in 1991 to 2005 years in spite of practical eradication of diseases in China between 1952 and 1964. In total, 9 480 cases of congenital syphilis were recorded just in year 2008. Such statistical data also show the important impact on economy of the social system in China and are associated with economic growth and globalization in the country (similar to the return of prostitution to the Czech Republic after 1989) [11].

The relatively recent epidemic in the USA showed a peak incidence in 1990 at a rate of 20.3 cases per 100,000 persons, the highest rate since 1949. There is no simple explanation for this progressively increasing trend. Different risk groups were affected during different epidemic cycles. The increases from 1960 to 1983 were observed mostly in men, and the increase between 1985 and 1990 affected both men and women [12]. Syphilis rates were on rise in the United States in homosexual and bisexual men between 1990 and 2003 [13]. In our region we were not able to demonstrate similar increases in these two groups. However the reported cases are very low and there is an increase in HIV infection between men having sex with men in the Czech Republic.

A great deal of attention has been paid to medical approaches to the control and prevention of syphilis. Despite the fact that syphilis was nearly eradicated in the Czech Republic after WWII, it remained a significant public health problem. The control and prevention of syphilis in the Czech Republic has been largely carried out through preventive programmes coordinated by state health departments and funded almost completely by the government. With the fall of „iron curtain“, we are confronted with an increased migration, facing prostitution and problems with drug users. Such infections occur in populations having multiple socioeconomic, behavioural, and cultural risk factors leading to adverse health outcomes. Sexually transmitted infections cannot be prevented definitively without also solving some of these problems.

Beside the hygienic and epidemiological regulations for the infectious disease care, a process

of regulating the isolation measures at venerological departments has been elaborated in a law together with procedures for collecting of sensitive data, which are anonymized. Disease carriers are required to submit to the examination, management and supervision as well as to the other epidemiological regulations in order to suppress wide spreading of infectious diseases including syphilis. Carriers are also required to follow the physician's instructions not to perform activities which could threaten other individuals and to inform physician about all conditions before examination or treatment. A total of 97% of all patients comply with such regulations and about 3% of individuals do not or disappear from the system (prostitutes, homeless, refugees or some foreigners and illegal immigrants). The official health care system is not able to reach such individuals with its restricted competences. This might be a good opportunity for non-governmental organization, which already put forward several projects in this area. Unfortunately such projects are usually not able to cover the entire territory of the country, but due to activities of such organizations it is possible to better assess the situation. This leads to many positive cases among such hard-to reach individuals being treated and reported. Educated street workers are active among such communities and they are able to reach clients for examination and management on a voluntary base [9].

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