ORIGINAL ARTICLE

The fall and rise of gonorrhoea incidence in Israel: an international phenomenon?

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Background: There is evidence of a recent resurgence of the incidence of gonorrhoea in some countries.

Aim: To examine trends in gonorrhoea incidence in Israel and compare them with the United States and countries in Europe

Method: The 1967–2001 annual incidence of gonorrhoea in Israel was obtained from the Israel Ministry of Health's department of epidemiology and for the United States from summary reports of the Centers for Disease Control. The incidence of gonorrhoea in European countries was extracted from the World Health Organization, Health for All database.

Results: In Israel, following a long period of decline from 40 per 100 000 in 1970 to 0.74 per 100 000 in 1997, incidence rates began to increase in 1998 to 13.8 per 100 000 in 2001. This pattern parallels those observed in a number of European countries and to some extent, in the United States. Most reported morbidity in Israel occurs among males aged 20–44 years.

Conclusions: The resurgence of gonorrhoea does not appear to be explained solely by behavioural changes. Transmission of the disease should be further studied among different subpopulations in order to develop new prevention strategies.

During the 1950s and 1960s, there was a steep, worldwide increase in gonorrhoea incidence rates^{1,2} followed by a reversal of this trend in the early 1970s.^{1,2} The decline in incidence became more widespread around 1981, accelerated from about 1985 and plunged to record lows in the late 1980s.^{1,2} The drop in rates before 1984 occurred too early to be ascribed to behaviour changes resulting from the AIDS pandemic. Subsequently, behaviour changes appear likely to have played a part, particularly among men who have sex with men.^{3,4} Nevertheless, part of the decline may be due to a cyclical behaviour in the incidence of the disease.⁵

Recently, there have been reports of a resurgence of the disease in various countries, among both homosexuals and heterosexuals.^{2,6–8} Israel is a low incidence country for HIV/AIDS, and it was of special interest to compare trends in the incidence of gonorrhoea with other countries. In this paper we analyse the epidemiology of gonorrhoea in Israel between 1973 and 2001 and compare it with that in other countries.

MATERIALS AND METHODS

Gonorrhea is a notifiable disease in Israel. The annual incidence of laboratory proved gonorrhoea in the civilian population between 1967–2001 was extracted from publications of the Israeli Ministry of Health's department of epidemiology. Data for 1996 to 2001 are based on provisional weekly reports. The population denominators were based on mid-year estimations produced by the Israel Central Bureau of Statistics.

The incidence rates of gonorrhoea in European countries were extracted from the World Health Organization, Health for All database.¹ The incidence in the United States was taken from the Centers for Disease Control and Prevention reports and publications.² Linear regression analysis was used to estimate trends in gonorrhoea incidence during different time periods for Israel and the United States.

RESULTS

The trends in the incidence of gonorrhoea in Israel and the United States, for the years 1973–2001, are shown in figure 1. Since the rates are much higher in the United States, the scale on the y-axis for Israel ranges from 0 to 50 per 100 000 and for the United States from 0 to 500. Several regression lines are shown for Israel and the United States. A decline in the rates was noted in Israel and the United States starting in the mid-1970s. In Israel, the incidence declined by 35% in 1986, by 75% in 1987, and during 1994–7, almost no new cases of gonorrhoea were reported. Between 1985 and 1997, the incidence in the United States declined steadily by a total of 68%. In 1997, an increase in incidence in both countries was observed. The incidence increased in Israel from 0.74 per 100 000 in 1997 to 117.5 in 2001. In the United States, the rate increased by 9% between 1997 and 1999, but has remained stable since then. The marked decline during the second half of the 1980s was observed in many western European countries, followed by a substantial increase in incidence during 1998–9 in countries such as Sweden and Denmark (fig 2). The declining trend during the 1980s was much less marked in many eastern European countries (data not presented).

In Israel, during 1996–7, cases occurred sporadically at the rate of about four to five per 4 week period. By 2000, about 40–50 cases per 4 week period were being reported. Most reported cases occurred in the age group 20–44 (detailed data not shown). Ninety six per cent of the cases were among males.

DISCUSSION

From the mid-1980s until 1997 a marked decline in the incidence of gonorrhoea was observed Israel followed by the start of a new epidemic. It is now clear that the previously reported decline in incidence in Israel in the late 1980s and early 1990s,⁹ was part of a long term trend, observed in many other countries. There is no clear explanation for the declining trends during the 1970s and early 1980s. In Israel, the rapid decline in incidence between 1986 and 1997 is likely to have

Figure 1 Trends in annual incidence rates of gonorrhoea in Israel and the United States (1973–2001) with selected linear regression lines.

been, at least in part, a consequence of sex behaviour changes, with increased condom use and a reduction in the number of sex partners.¹⁰ In other countries, some studies reported changes in the sexual behaviour of homosexual men such as a reduction in the number of sex partners and a change to safer sex practices.³ Among heterosexuals, there has also been evidence of changes in sexual behaviour and of reduced rates of STDs.⁴

On the other hand, the increase in behavioural changes cannot solely explain the decrease in incidence. The incidence in Israel, as in many other countries, started declining in the mid-1970s,⁹ before the AIDS pandemic. The possibility that the decline is part of an unexplained cyclical trend in the disease cannot be entirely excluded.⁵

The recent increase in incidence in Israel during 1997–2001 is similar to that seen in many other countries. As early as 1994, an increased incidence of gonorrhoea was found in genitourinary medicine clinics in the United Kingdom.⁷ An increase in both gonorrhoea and syphilis was observed in Amsterdam STDs clinics, particularly among homosexuals.⁸

While it is well recognised that gonorrhoea is under-reported, there is no evidence of a change in reporting rates, so trends should be relatively unaffected by incomplete reporting. In Israel, during the period under study, no efforts were

made to improve surveillance and no changes in diagnostic tools were introduced. The consistency in the trends from many countries also supports the hypothesis that the recent increase is not an artefact.

There are several possible explanations for the recent resurgence of the gonorrhoea pandemic. Some reports suggest a correlation between increase in unsafe behaviour and increased incidence of gonorrhoea.^{6,10} In Israel, however, ongoing studies show no clear evidence of an increase in risky behaviour among soldiers aged 20–21 (Grotto, unpublished data). On the other hand, there has recently been an increase in the incidence of syphilis in Israel, which would strengthen the case for an increase in unsafe behaviour. Nevertheless, the incidence changes could be partly related to changes in the behaviour of the organism. Furthermore, the worldwide increase in antibiotic resistance of gonococci¹¹ may have led to increased transmission of the disease. Another possible cause relates to the core group hypothesis,¹² where the spread of gonorrhoea is facilitated through high risk groups such as sex workers. In Israel, during the past few years, the sex worker population has been augmented by foreign workers from countries with substantially higher rates of gonorrhoea.

There is now evidence of a new gonorrhoea pandemic. In Israel, educational prevention programmes by the public

Figure 2 Trends in annual incidence rates of gonorrhoea in selected European countries (1980–99) (WHO HFA database).

health services have been intensified and an outreach programme based on free examination of sex workers has been initiated by the district health offices in the metropolitan areas. Studies to monitor changes in sexual behaviour, response to educational programmes, and the patterns of transmission of the disease in subpopulations are necessary in order to improve the prevention strategies.

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