

Syphilis in women of reproductive age in Mogadishu, Somalia: serological survey

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SUMMARY In Mogadishu, Somalia 223 women of childbearing age, including prostitutes, were tested for serum markers for syphilis by the Venereal Disease Research Laboratory (VDRL) test and the *Treponema pallidum* haemagglutination assay (TPHA). Sera reactive in either of these tests were tested for IgM antibodies by solid phase haemadsorption assay (SPHA). Three per cent of sera from 67 pregnant women and none of those from 71 educated women gave positive results that were confirmed with the TPHA. In contrast, 58% of sera from 85 prostitutes were confirmed as being positive, 26% of which were SPHA positive, which indicated active syphilis. The proportion of TPHA positive sera increased with age among the prostitutes. As venereal syphilis is highly prevalent in prostitutes in Mogadishu, a strategy of intervention based on screening followed by treatment seems to be indispensable.

The prevalence of syphilis is higher in some developing countries than in Europe and the United States of America.^{1,2} In many parts of Africa, such as Mozambique,³ Zambia,^{4,5} Swaziland,⁶ and Ethiopia,⁷ syphilis is common and the incidence of congenital syphilis is high, whereas in Europe and the United States, as a result of extensive preventive maternal welfare, congenital syphilis has fallen to such a low level that it has become a "forgotten" disease.⁵

Very few clinical and epidemiological studies have been reported from Somalia so far, although syphilis is considered to be a major health problem. Results of a survey conducted in 1983 at the sexually transmitted disease (STD) clinic in Mogadishu and four regional hospitals showed a positive VDRL reaction in 18% of STD patients and 6.5% of blood donors (Podgore *et al.* A survey of sexually transmitted diseases in the Democratic Republic of Somalia. International Congress of Infectious Diseases, Cairo, 1985, abstract). In recent years there have been no reports of the existence of yaws in Somalia.⁸

The aim of the present study was to estimate the prevalence of syphilis in three groups of women of childbearing age in Mogadishu.

Patients and methods

STUDY POPULATION

Three different groups of women of childbearing age were studied in a cross sectional survey conducted during July to August 1985 and in January 1986 in Mogadishu. (Further information about the study design has been published elsewhere.⁹) The study population consisted of: 67 pregnant women (aged 16 to 40, mean 25, with a mean history of 3.8 pregnancies); 71 mainly educated women, such as doctors, nurses, university students, and administrative staff (aged 15 to 44, mean 23, with a mean history of 1.3 pregnancies) who volunteered to participate in the study; and 85 known professional prostitutes (aged 14 to 48, mean 23, with a mean history of 1.6 pregnancies) who had recently been detained in a military camp for a special programme arranged by the government to improve behaviour.

Questions were asked according to a standardised protocol about age, occupation, number of pregnancies, history of syphilis, and (for the prostitutes) number of clients and foreign sexual contacts.

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SEROLOGICAL TESTS

Blood samples were taken by venepuncture. The collected sera were kept at -20°C and then transported to the National Bacteriological Laboratory (NBL) in Stockholm where the serological analyses were performed. All sera were screened by the Venereal Disease Research Laboratory (VDRL) test and the *Treponema pallidum* haemagglutination assay (TPHA).¹⁰ The VDRL test was considered to be reactive if flocculation appeared at a dilution of 1:1 and the TPHA test was regarded as positive if agglutination occurred at a dilution of 1:80.

The sera that were positive in either of the two tests were tested for IgM antibodies by the solid phase haemadsorption assay (SPHA) performed according to the original description by Schmidt.¹¹ A titre of 1/8 or more was considered to show a positive result. This test was used to differentiate between active and inactive syphilis.¹¹

STATISTICAL ANALYSIS

Descriptive statistics and correlation analysis using the χ^2 test incorporated in the computer program, Quest (University of Umeå, Sweden), were used for statistical analysis.

Results

Table 1 shows the results of the VDRL test and TPHA in the three different groups of women. Of the 67 pregnant women, two (3%) had positive VDRL test results that were confirmed by positive TPHA results. Three (4%) of the sera from the 71 educated women were reactive in the VDRL test, but none of them was confirmed positive, which indicated that the VDRL reactions were false positives.

Of the 85 prostitutes, 50 were VDRL positive. Thirty eight of these 50 reactive sera were confirmed positive in the TPHA. The remaining 12 (14%) sera were negative in the confirmatory test and were thus considered to have shown false positive VDRL reactions. Positive TPHA results in the absence of a reactive VDRL test were found in 11 (13%) of the 85 sera tested. Thus 49 (58%) of the sera from prostitutes gave positive reactions in the TPHA. The

Table 1 Results of Venereal Disease Research Laboratory (VDRL) test and *Treponema pallidum* haemagglutination assay (TPHA) in three different groups of women in Mogadishu, Somalia

Study group	TPHA VDRL	+		-		Total
		+	-	+	-	
Pregnant women		2	0	0	65	67
Educated women		0	0	3	68	71
Prostitutes		38	11	12	24	85

+ = positive, - = negative results.

Table 2 Results of solid phase haemadsorption assay (SPHA) for IgM in sera from female prostitutes in Mogadishu, Somalia, tested by Venereal Disease Research Laboratory (VDRL) test and *Treponema pallidum* haemagglutination assay (TPHA)

Results in SPHA	TPHA VDRL	+		-		Total
		+	-	+	-	
Positive		13	0	0	0	13
Negative		25	11	12	24	72
Total		38	11	12	24	85

+ = positive, - = negative results.

predictive value of a positive VDRL test result was 76%. Of the 49 seropositive prostitutes, 15 (31%) had a history of syphilis, whereas of the 36 seronegative prostitutes only four (11%) claimed to have had syphilis earlier. The figure shows that positive TPHA results increased with the age of the prostitutes ($p = 0.03$).

IgM antibodies were not detected by the SPHA in VDRL or TPHA positive sera from the pregnant or the educated women, whereas 13 (15%) of the sera from the prostitutes were SPHA positive (table 2). All sera that were negative in the VDRL test were negative in the SPHA. One of the 13 prostitutes who had IgM antibodies was pregnant at the time of the study.

Of the 55 prostitutes who answered this question, 45 (82%) claimed to have had only local clients. These 55 women had one to 105 (mean 14) sexual partners a week.

Discussion

Serological testing showed that 3% of the pregnant women and none of the educated women had anti-

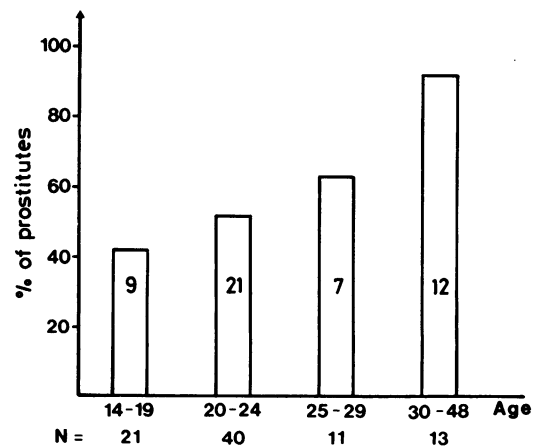


Figure Prevalence of positive results in *Treponema pallidum* haemagglutination assay (TPHA) in female prostitutes in Mogadishu, Somalia, correlated to age of women.

bodies to *T pallidum*. Podgore *et al* (International Congress of Infectious Diseases, Cairo, 1985, abstract) have shown a VDRL positivity rate of 6.5% in blood donors and 19% in patients attending an STD clinic in Mogadishu. The prevalence in the prostitutes in the present study was significantly higher (58%) ($p < 0.001$). Similar high figures (31 to 53%) for the prevalence of syphilis have been obtained in a study of three socioeconomic classes of prostitutes in Nairobi.¹² Moreover, IgM antibodies were detected in 15% of the prostitutes in the present study, which indicated that they were suffering from active syphilis (table 2). Thus, prostitutes seem to be a major reservoir of syphilis in Somalia, as in some other African countries.

Judging from the questionnaire, the source of syphilis in Somalia is mainly domestic, as most (80%) of the prostitutes had only local clients. The risk of disseminating this infection within the Mogadishu community would thus be very high.

TPHA positive sera that are VDRL negative are considered to indicate a previously treated infection. In the present study the sera from as many as 11 (22%) of the TPHA positive prostitutes were VDRL negative. Four of these prostitutes had a history of syphilis, which may indicate that they had been successfully treated. The remaining seven prostitutes might have been treated with antibiotics for other reasons or might have taken antibiotics themselves, as these drugs are readily available in Somalia.

As no case of yaws has recently been reported from Somalia,⁸ this disease does not seem to be a differential diagnostic problem in the present study.

It is extremely important to set up some intervention measures to reduce the high incidence of syphilis in prostitutes in Somalia. Considering the high rate (14%) of false positive VDRL test results in the prostitutes, the use of a confirmatory test seems important. The predictive value of positive VDRL test results in the prostitutes was only 76% in the present study. To avoid treating non-infected people, the use of a confirmatory test for VDRL positive specimens seems to be essential. The TPHA is regarded as a valuable verification test and is easy to handle, but might give some false negative results in early cases of syphilis.¹³ Serological tests such as the VDRL and TPHA are not expensive and can be performed in less well equipped laboratories.

Considering the present situation in Somalia, the VDRL test and TPHA would be sufficient for screening risk groups, such as pregnant women, prostitutes, and STD patients. The quantitative VDRL test is essential and allows workers to judge whether treatment has been adequate. The SPHA could be used in special cases for the diagnosis of active syphilis. The

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SPHA is easy to perform and is considered to give reliable results.

A desirable urgent aim would be that every pregnant woman in Somalia could have a serological check for syphilis at the end of the first trimester. As prostitutes seem to be the major reservoir of the disease, strong controlling measures are important. It would be desirable to screen them periodically, though it would be difficult to trace all of them as prostitution is illegal in Somalia. Such a programme would, however, certainly reduce the incidence and the consequences of syphilis in Somalia.

We thank Professor Abdi Ahmed Farah for his support and Dr Mohamed Warsame and the staff of the department of obstetrics and gynaecology, Banadir Hospital, Mogadishu, for their valuable help in collecting the specimens from pregnant women.

This work was supported by grants from the Swedish Agency for Research Co-operation with Developing Countries (SAREC) and the Somali Academy of Science and Arts (SOMAC).

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