

Syphilis in pregnant women in Mozambique

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SUMMARY To establish the prevalence of syphilis in pregnant women in Mozambique and evaluate present diagnostic methods, 1468 pregnant women in eight of the country's 10 provinces were examined using the Venereal Disease Research Laboratory (VDRL) test. Positive serum samples were also analysed using the *Treponema pallidum* haemagglutination (TPHA) assay and one group was also analysed using the fluorescent treponemal antibody absorbed (FTA-ABS) test.

The prevalence of VDRL seroreactivity was found to be between 4·5% and 14·6%, whereas the prevalence of treponemal disease as verified by TPHA or FTA-ABS tests was between 1·6% and 9·8%. It is concluded that syphilis is relatively common among pregnant women in Mozambique. The predictive value of a positive VDRL test, when adequately performed, was found to be 77%.

Introduction

Active syphilis in a pregnant woman may cause spontaneous abortion, stillbirth, or congenital syphilis. When the neonate is affected, clinical symptoms may be manifest at birth or develop during the years of childhood. Serological tests for syphilis are therefore often routinely performed early in pregnancy.

The importance of pregnancy screening for syphilis in a country with limited health care resources must, however, be weighed against other needs. The prevalence of syphilis in pregnant women, laboratory capacity, and the possibility of treating infected women adequately must be considered from a cost benefit point of view when deciding whether or not to include routine serological screening for syphilis in a national maternal health care programme.

Syphilis is considerably more common in Africa than in Europe or in the United States of America.¹⁻³ In Zambia, for example, 6·5% of newborn children in Lusaka had serological signs of syphilis,⁴ and syphilis was a common diagnosis among children in

hospital, which resulted in high mortality.^{5,6} In Swaziland the estimated yearly incidence of syphilis among adults was as high as 1·4%.⁷

In Mozambique no nationwide study of the prevalence of syphilis in pregnancy has as yet been performed. The purpose of the study published here was to estimate the prevalence of syphilis during pregnancy in Mozambique and to evaluate present diagnostic methods.

Patients and methods

PATIENTS

We studied two groups of pregnant women.

Group 1 consisted of 755 pregnant women examined during a nationwide study of maternal morbidity in 1982-3.⁸ The study was carried out in six of the country's 10 provinces, at sites underlined in the figure. About two thirds of these women lived in rural areas. At five of the six sites all the pregnant women in a defined area (village or part of town) were mobilised to participate, and the influence of local leaders and health workers was used to achieve maximum coverage. At the sixth site, Mbemba, the community approach was impossible for a number of practical reasons, so the study was performed in an antenatal care unit.

In group 1, 21% of the women were in the first trimester, 41% in the second, and 38% in the third, according to dates of last menstrual periods and

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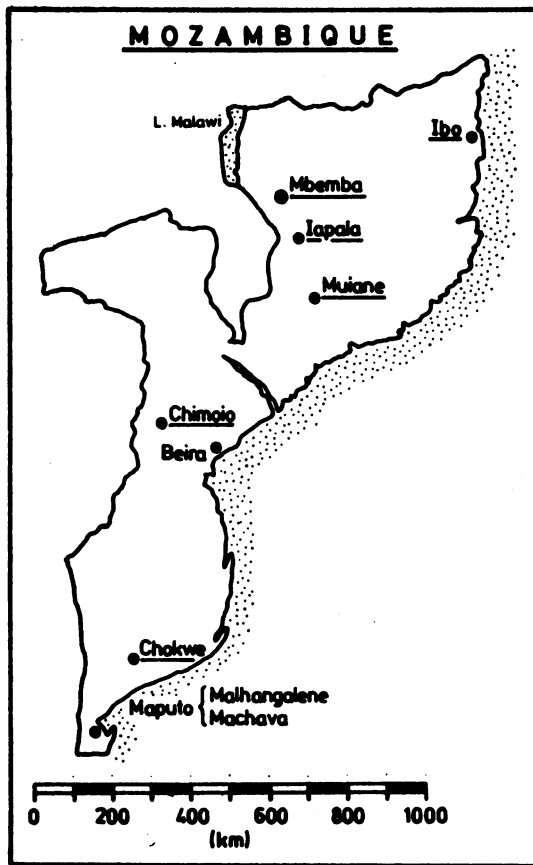


FIG Sites in Mozambique where serum sampling was undertaken (names underlined are sites where the 755 patients in group 1 were seen in 1982-3,⁸ 713 women attending antenatal care units at Beira and Maputo made up group 2).

reasonably confirmed by uterine heights. Details of age, parity, and socioeconomic characteristics of the women in group 1 have been described in detail elsewhere.⁸

Group 2 consisted of 713 pregnant women chosen at random in the antenatal care units of Beira and Maputo. In the latter, the capital, the sampling was carried out in the suburbs of Machava and Malhangalene. Some degree of self selection might occur in antenatal care groups, as well as possible predominance of last trimester attenders.

Of the 1468 women studied, almost 40% lived in rural areas, often in small villages. Most of the remaining women, that is the urban dwellers, lived in suburban townships.

METHODS

In group 1, each woman was interviewed about her obstetric history and socioeconomic group. Clinical

examination included measurement of upper arm circumference, triceps skinfold thickness, weight, height, and uterine height. A blood sample was taken from the cubital vein for haematological and serological analyses, centrifuged within 10 hours, and the serum was stored at -20°C . In group 2 the study had to be limited to serum sampling, and no systematic collection of epidemiological or clinical data was carried out.

The Venereal Disease Research Laboratory (VDRL) test was performed in the department of biochemistry of the Faculty of Medicine, Maputo, on all serum samples, as described previously.⁹ Reagents used were from Difco (Detroit, USA), Behringwerke (Marburg, West Germany), Hoechst (Frankfurt, West Germany), Wellcome (London, England), or the Swedish National Bacteriological Laboratory. The test was regarded as positive if any flocculation occurred at a titre of 1/1.

The *Treponema pallidum* haemagglutination assay (TPHA) was performed on all serum samples showing positive reactions in the VDRL test. Reagents from the Cellognost syphilis kit (Hoechst) were used.

The fluorescent treponemal antibody absorbed (FTA-ABS) test was performed in Stockholm on all VDRL positive serum samples from group 1.

In group 1, 601 serum samples were also examined at the district or provincial hospital closest to the site where each woman was seen. The VDRL test was performed on these serum samples according to local routine. In cases where this result did not correspond with that obtained in Maputo, the test was repeated at the National Bacteriological Laboratory, Stockholm, Sweden.

Results

Table I shows the prevalence of VDRL seroreactivity in the women studied at each site as well as the degree of confirmation by treponema specific tests.

A positive VDRL test reaction was found in 4.5% to 14.6% of the women examined, and 1.6% to 9.8% showed evidence of treponemal infection as confirmed by the specific tests, TPHA or FTA-ABS, or both. In the whole study population, 93 of the 121 reactors to the VDRL test were shown to have treponemal infection, giving a predictive value of a positive VDRL test reaction of 77%.

All VDRL positive serum samples from patients in group 1 underwent not only TPHA but also FTA-ABS analysis, and all but one of the 36 TPHA positive serum samples were also FTA-ABS positive. Of the 46 serum samples analysed in Maputo and in Stockholm, 44 gave similar results.

TABLE I Prevalence of positive Venereal Disease Research Laboratory (VDRL) test, *T pallidum* haemagglutination assay (TPHA), and fluorescent treponemal antibody absorbed (FTA-ABS) test results on groups studied

Group	Site	No of women	No (%) VDRL positive	No (%) also positive to either TPHA or FTA-ABS, or both
1	Ibo	123	12 (9.8)	11 (8.9)
	Mbemba	41	6 (14.6)	3 (7.3)
	Iapala	246	15 (6.1)	8 (3.3)
	Muiane	64	3 (4.7)	1 (1.6)
	Chimoio	220	10 (4.5)	6 (2.7)
	Chokwe	61	6 (9.8)	5 (8.2)
2	Beira	130	9 (6.9)	7 (5.4)
	Malhangelene	388	60 (10.3)	38 (9.8)
	Machava	195		14 (7.2)
Total		1468	121	93

Group 1 = 755 pregnant women studied in 1982-3.⁸

Group 2 = 713 pregnant women who attended the antenatal care units at Beira and Maputo.

Table II shows that of the 601 VDRL tests also performed at local laboratories, 19 (51%) of the 37 tests reported as positive were shown to be negative when checked in Maputo and Stockholm, while 14 (44%) of the 32 VDRL reactions that were actually positive had been reported as negative.

TABLE II Comparison of Venereal Disease Research Laboratory (VDRL) test results in local and reference laboratories

Results at local laboratories	Results at reference laboratories in Maputo and Stockholm:		
	Negative	Positive	Total
Negative	550	14	564
Positive	19	18	37
Total	569	32	601

Discussion

The pregnant women studied were representative of large groups of pregnant women in rural and urban areas of Mozambique, and the serological work performed in the Maputo laboratory was of a high quality, as confirmed in Stockholm.

The local laboratories whose VDRL results were cross checked gave far from satisfactory results, and practical measures for improvement will be proposed elsewhere. The VDRL test is cheap to perform but its use of microscopic reading necessitates an exact laboratory technique. The somewhat more expensive rapid plasma reagin (RPR)¹⁰ test uses the same antigen as the VDRL test, but its use of macroscopic

reading makes it easier to perform. The TPHA test may be a good option for qualified laboratories in the developing world when a confirmatory test is needed.

The prevalence of VDRL seroreactivity was found to be 4.5% to 14.6% in the groups studied. If a positive VDRL test result together with at least one positive confirmatory test result is considered to be reasonable evidence of treponemal infection, the prevalence of infection varied between 1.6% and 9.8%. Of all VDRL tests performed, 77% were confirmed by specific tests (the predictive value was 77%), 23% thus being false positive results. False negative VDRL reactions are reported to be very rare when the tests are adequately performed.¹¹ This question was not studied in the present work.

Yaws is the only treponemal disease apart from syphilis that has been reported from Mozambique. It was eradicated from Mozambique by the World Health Organisation (WHO) campaigns in the early 1950s, and a recent WHO publication does not report notable recurrence of the disease in the country.¹ Rare cases of yaws are still seen in northern Mozambique, according to reports from local doctors. Thus, though occasional women in the fertile age group may have positive treponemal seroreactions due to yaws, it must be concluded that most treponemal infections in pregnant women are caused by syphilis.

In neighbouring countries the prevalence of syphilis has been studied in health institutions but not at community level as in our study (group 1). Thus 15.8% of parturients at the university hospital and 12.5% of antenatal care attenders in Lusaka, Zambia were reported to be seroreactive for syphilis,^{1 2 5} and 10-14% of antenatal and family planning care attenders in Swaziland were RPR positive.^{7 13} Syphilis is evidently highly prevalent in the region.

The incidence of congenital syphilis in liveborn infants or of spontaneous abortion due to syphilis in Mozambique is not known. A parallel study of stillbirths in the capital city of Maputo indicated, however, that 13 out of 153 (8.5%) consecutive stillbirths were caused by syphilis (Axemo *et al*, unpublished observation). Congenital syphilis in liveborn infants has been studied in Lusaka, where 30 (6.4%) of 469 consecutive neonates were seropositive for syphilis, and four (0.9%) of them developed signs of congenital syphilis.⁴ In a study in Addis Ababa 21.3% of the babies of VDRL positive mothers developed congenital syphilis.¹⁴ The perinatal complication rate is evidently high in regions where syphilis in pregnancy is common.

Measures to reduce the incidence of syphilis and its complications during pregnancy and among neonates

should be given high priority in perinatal care. As migrant labour, rapid urbanisation, war, and poverty are highly conducive to the spread of the disease, a community based approach with continuous adequate screening and treatment would be indispensable.

We conclude that syphilis during pregnancy is relatively common in Mozambique and that laboratory techniques should be improved at a local level. A positive VDRL test, when well performed, has a predictive value for syphilis of 77%.

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