Syphilis in pregnant women in Zambia

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SUMMARY Because of the high incidence of congenital syphilis at the University Teaching Hospital, Lusaka, Zambia, the potential risks of congenital infection and fetal loss due to syphilis were assessed by screening 202 antenatal patients, 340 pregnant women admitted to the hospital whose pregnancies ended in either spontaneous abortion or stillbirth, and 469 consecutive babies delivered at the hospital. Primary serological screening was performed with the rapid plasma reagin test, and reactive sera were confirmed by the *Treponema pallidum* haemagglutination test. In all cases detailed histories were obtained and patients were examined for clinical signs of syphilis. The TPHA test result was reactive in 12.5% of antenatal patients and in 42% of women who aborted in the later half of pregnancy. Among 469 consecutive babies delivered at the hospital, 30 had reactive results to the TPHA test; of these two were stillborn and four had signs of congenital syphilis at birth. Thus, syphilis appears to affect adversely an appreciably high number of pregnant women in Zambia. For this reason a special campaign to screen adequately and treat pregnant women and neonates is needed.

Introduction

There have been no reports of the existence of non-venereal treponematoses in Zambia, and no cases have been suspected among more than 60 000 patients seen in a five-year period at the dermatovenereology department of the University Teaching Hospital, Lusaka. The reason for this is the near temperate climate of Zambia with temperatures not exceeding 32°C and a light rainfall, which is limited to only four months in the year. On the other hand, venereal syphilis is a very common problem seen at the University Teaching Hospital in Lusaka, the capital city, and also at sexually transmitted disease (STD) clinics in other regions of the country. Despite a ratio of 5:1 of male and female patients attending the STD clinic at this hospital the number of women with syphilis is twice that of men; they are mostly seen in the later secondary stage of infection.¹ Early syphilis was diagnosed in 7.6% of pregnant women attending this clinic, and as a result of routine screening in the antenatal clinic of this hospital 17.9% of women had reactive serological test results for syphilis.² Consistent with the high prevalence of syphilis in pregnant women, congenital syphilis was

common (8.6%) among infants under 3 months of age who required admission to hospital.³

These preliminary investigations suggested a pool of infectious syphilis in women of reproductive age with high risks of neonatal infection and pregnancy loss. The present study was undertaken to assess the extent of this problem and to identify risk factors that might be eliminated by improved prenatal care.

Patients and methods

Three groups of patients were investigated: (a) 202 pregnant women who attended a suburban antenatal clinic for the first time; (b) 340 pregnant women whose pregnancies resulted in either spontaneous abortion or stillbirth; and (c) 464 pregnant women admitted to the labour ward of this hospital for delivery. In each group consecutive patients were examined. The socioeconomic background and relevant obstetric and prenatal histories of each patient were recorded; the patients were examined for clinical signs of syphilis. Examination by darkfield microscopy was performed in appropriate cases. Blood samples were obtained for preliminary serological screening for treponemal antibodies with the rapid plasma reagin (RPR) test and reactive sera were tested by the *T pallidum* haemagglutination (TPHA) test according to the manufacturers' instructions (Beckton, Dickinson & Co and

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Accepted for publication 10 May 1982

Wellcome Research Laboratories respectively). In the third group of patients preliminary screening was performed on cord blood, and if that was reactive blood samples from both mother and baby were obtained for testing by the RPR and TPHA tests. In addition, in all babies whose sera were reactive in these tests clinical and radiological examination of the long bones was performed. The cerebrospinal fluid was examined routinely for the presence of treponemal antibodies.

Results

The results of serological testing of patients in the three groups are shown in table I. At the time of examination 85% of the women in the antenatal group were ≥ 20 weeks pregnant. One hundred and seventy-three of the 240 spontaneous abortions occurred before the 20th week of pregnancy. Seroreactivity in the TPHA test in these two subgroups was 9.8% and 41.8% respectively. In 36 of the 42 seroreactive women who gave birth to still-born babies, the presence of syphilis was the only recognisable aetiological factor. Thirty-five women had premature deliveries; 40 of the babies were macerated at birth.

The marital state and antenatal and obstetric histories of the 167 cases of fetal loss beyond the 20th week of pregnancy are given in table II. There were

no significant differences in age, marital and economic state, education, and parity between seropositive and seronegative groups. A history of previous abortion or stillbirth and antenatal reactivity to the Venereal Disease Research Laboratory test was significant in the seroreactive group. A similar analysis of 464 consecutive pregnant women at delivery is shown in table III. Among the 30 seroreactive babies, four had clinical signs of congenital syphilis at birth (*T pallidum* was detected by darkfield microscopy of exudate in three babies), two were stillborn and, because of prematurity, asphyxia, and conjunctivitis, a further eight required intensive care. The overall mortality and morbidity rates in babies whose sera were reactive in the TPHA test were significantly higher ($\chi^2 = 68.86$; $P < 0.001$) than in those whose sera were not reactive.

Discussion

The results of this study confirm that syphilis is a major problem in Zambia with a high risk of pregnancy loss and congenital infection. Four of 459 consecutive liveborn babies had signs of congenital syphilis at birth. The actual incidence can be expected to be much higher among the 30 seroreactive neonates even though some might have acquired maternal antibodies only by passive transfer. In view of the potential risk all the 30

TABLE I Results of testing sera by the rapid plasma reagin (RPR) and *T pallidum* haemagglutination (TPHA) tests for treponemal antibodies in three groups of patients

Group of patients	No of sera reactive by RPR test	No of sera confirmed reactive by TPHA test (% of total screened)	Total No of sera screened
Antenatal patients	29	25 (12.5)	202
Patients whose pregnancies resulted in:			
Spontaneous abortions	52	45 (18.8)	240
Stillbirths	45	42 (42.0)	100
Patients admitted for delivery	33	30 (6.5)	464

TABLE II Marital state, obstetric history, and antenatal screening results by RPR test in 167 women who had a spontaneous abortion after the 20th week of pregnancy or a stillbirth

Marital state and obstetric history	No of women with the following TPHA test results:		
	Seronegative (n = 97)	Seropositive (n = 70)	Total (%) (n = 167)
Unmarried	8	11	19 (11.4)
Past history of abortion/stillbirth	7	12	19 (11.4)
Non-attendance at antenatal clinics	34	26	60 (35.9)
Antenatal VDRL results at initial attendance			
Test not performed	65	60	125 (74.9)
Reactive	0	5*	5 (11.9)
Non-reactive	32	5	37 (88.1)

*No specific treatment received

VDRL = Venereal Disease Research Laboratory (test); TPHA = *T pallidum* haemagglutination (test)

RPR = rapid plasma reagin (test)

TABLE III *Marital state, obstetric history, results of antenatal screening by the RPR test, and outcome of pregnancy in 464 women admitted for delivery*

Marital state and obstetric history	No of women with the following TPHA test results:		
	Seronegative (n = 434)	Seropositive (n = 30)	Total (%) (n = 464)
Unmarried	18	1	19 (4.1)
History of abortion/stillbirth	59	8	67 (14.4)
Non-attendance at antenatal clinics	60	8	68 (14.7)
Antenatal VDRL results at initial attendance			
Test not performed	110	2	112 (28.3)
Reactive	5	10	15* (5.3)
Non-reactive	259	10	269 (94.7)
Outcome of delivery†			
Stillbirth	3	2	5 (1.1)
Baby required intensive care	19	12	31 (6.1)
Healthy baby	418	16	434 (93.5)

*Only 11 women had received treatment before delivery

†Total number of babies was 470, which included six pairs of twins

seroreactive babies were given treatment. In a similar study in Addis Ababa⁴ seroreactive babies at birth were followed up without treatment and 21.3% subsequently developed signs and symptoms of early congenital syphilis.

Women with syphilis abort more than 60% of their pregnancies,⁵ which might explain the much lower seroreactivity rate among neonates compared with that of the prenatal women. The fact that there was a high incidence of clinical syphilis and seroreactivity in cases of fetal loss in the later half of pregnancy supports this view. In the Johns Hopkins Hospital in 1923 syphilis was found to be the aetiological agent in 40% of stillborn premature infants and in about 80% of macerated babies.⁶ It is surprising that our results compare with those in the preantibiotic era. A high seroreactivity rate in women aborting in the later half of pregnancy as well as in women producing stillbirths compared with a lower rate of 9.8% in women aborting in early pregnancy supports the widely accepted view that syphilis is a major factor in fetal loss only in the later half of pregnancy.⁷ It is now increasingly believed, however, that fetal infection does occur even in the early weeks of pregnancy but appreciable damage to the fetus results only later in the pregnancy when an adequate immune response has developed in the fetus.⁸⁻¹⁰

Considering the high prevalence of syphilis in Zambia, the present antenatal care appears to be far from adequate (table III). Despite the fact that 85% of women had attended one or more antenatal examinations, screening by the VDRL test was not carried out in more than one-quarter of these women; furthermore, not all those with positive results received treatment. The problem of women acquiring syphilis after screening by the VDRL test in early pregnancy has been highlighted before,¹¹ and the inadequacy of one serological test in early

pregnancy in a high risk population is apparent in our study. Ten women who had non-reactive test results in early pregnancy were seroreactive at the time of delivery. Similarly, in cases of spontaneous abortions in the later half of pregnancy, five had initially negative results. The presence of active early syphilis in as many as 26 out of 70 women in the later half of pregnancy also indicated recently acquired infection. A significantly greater number of these women had had a previous spontaneous abortion and they may carry a higher risk of repeated abortions. Since most pregnant women in Zambia attend for their first antenatal examination when the pregnancy is fairly advanced (≥ 20 weeks) the screening and treatment of women who might acquire syphilis early in pregnancy, which subsequently ends in an abortion, can be a difficult task. Under the present circumstances epidemiological treatment of all pregnant women with a history of a previous abortion in the later half of pregnancy would be justified. The absence of significant differences in age, education, parity, and socioeconomic factors between the seropositive and seronegative groups probably indicates widespread public ignorance of the problem.

The dramatic decline in the incidence of venereal syphilis after the introduction of penicillin in the mid-1940s and its slow resurgence in the past two decades is well known in the developed countries where statistics are available. Such information is not, however, available in the African continent and, especially in countries where non-venereal treponematoses existed at one time or other, the general situation remains unclear. Nevertheless, very high rates of venereal syphilis have been reported in urban areas in many African countries.¹²⁻¹⁸ Seroreactivity rates among pregnant women and the incidence of congenital syphilis are also staggeringly high.^{3,4,19,20}

compared with those in the developed world.²¹⁻²³ Despite the slow resurgence in the developed countries the incidence of syphilis (except in homosexuals) has been low, and increasing concern is now felt about the complacency of the medical profession and the attendant risk of diagnostic failure.²⁴⁻²⁵ Unfortunately, similar attitudes prevail in African countries which disregard the sustained high prevalence of syphilis in local populations. All grades of the medical profession in Africa, especially those concerned in maternal and infant care, need to be reminded that in our environment syphilis continues to behave as in the preantibiotic era, and therefore screening and early treatment of pregnant women is imperative.

Of the many congenital infections syphilis is not only the most readily identifiable but also the most easily treated. Hence there is an urgent need to revitalise antenatal care in Zambia with sufficient focus on syphilis. For this purpose we recommend that:

- (1) Every pregnant woman has a screening test for syphilis as soon as pregnancy is diagnosed and again in late pregnancy to detect infection acquired subsequently;
- (2) Because babies born of women who do not have antenatal care are at high risk for congenital syphilis, cord blood should be screened; and
- (3) Because a small number of women may not seek health care either for antenatal examination or for delivery, their infants should be screened for syphilis at the earliest opportunity.

To achieve these objectives a greater awareness among health staff as well as the general public is essential and a nationwide special campaign is recommended.

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