

Original article

Prevalence and significance of sexually transmitted diseases among Ethiopian women attending antenatal clinics in Addis Ababa

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Abstract: To determine the prevalence of sexually transmitted diseases (STDs) and the risk for (i) the mother regarding pregnancy wastage and puerperal sepsis and (ii) the child with regard to congenital and neonatal infection, 342 routine antenatal clinic (ANC) at tenders were investigated. The prevalence of antibodies showing exposure to specific STD pathogens in pregnant women attending ANC was: syphilis (TPHA) 27%, (VDR:) 28%, gonorrhoea 43%, genital chlamydiae 54%, HBV 37%, HSV-2 35 %, H ducreyi 10%. High titre seropositivity suggestive of active infection was: gonorrhoea 10%, genital chlamydiae 31 %, HSV2 19%; with HBV SAg 5% -all of which are likely to be transmitted to the foetus in utero or during delivery. Only 10% of ANC at tenders had no serological evidence of any STD: 72% had serological evidence for two or more STDs. Among conditions requiring treatment vaginitis was the most important, 20% having a severe trichomonal infection. Despite the frequency of this condition it was noted that few women (4%) complained of vaginal discharge. Thus women attending the ANC revealed a high prevalence of STD. Consequently the foetus and neonate are put at risk because of intrauterine or intrapartum transmission of infection. The high prevalence among ANC at tenders also reflects the relative prevalence of STDs in the community. Measures such as screening at ANC and information and education regarding prevention are required to reduce STDs in pregnant women and their sexual partners. Prophylaxis for the neonate can be considered until this goal is achieved. [Ethiop. J. Health Dev. 1995;9(1):31-40]

Introduction

With the decline of endocarditis and pyelonephritis in pregnant women, the problems of serious infections in obstetric practice have shifted from the pregnant Of parturient woman to her unborn or infant child (1). The foetus and the premature newborn, physiologically disadvantaged by immaturity, are prey to endogenous micro-organisms harboured in the birth canal. The likely etiological causes of congenital infection are grouped together in the unlovely word STORCH (syphilis, toxoplasmosis, other [viruses] , rubella, cytomegalovirus and herpes viruses) each of which may cause clinical manifestations in the newborn (1).Gonococcal ophthalmia, once a scourge in industrialised countries, is still extremely important in developing countries with highly prevalent STDs (2). Maternal Chlamydia trachomatis infections cause premature rupture of the membranes and low birth weight as well as neonatal ophthalmia and pneumonia (3). Maternal syphilis has long been recognised as a health hazard for the child, while more recently hepatitis B (4,5) and HSV2 have been shown to be vertically transmitted, the latter being passed from mother to child from infected genital lesions during vaginal delivery (1).

Ethiopia is a country where STDs are highly prevalent (6). The prevalence of STDs among ANC at tenders has not been quantified but for two notable exceptions. Screening for syphilis at a mother and child health clinic showed that 15%-17.6% (7,8) of the mothers were sero-positive. The prevalence of Neisseria

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gonorrhoeae was 9% in 200 isolates from asymptomatic parturient women (9). N. I gonorrhoeae were also isolated from 28% of 1 women with puerperal sepsis (9).

Routine antenatal screening for STDs has been, and still is for many African countries, only by serological tests for syphilis, usually using the Venereal Diseases Reference Laboratory (VDRL) or Rapid Plasma Reagin (RPR) tests. Gonorrhoea has been identified by the presence of intracellular gram negative diplococci in Gram-stained smears of endocervical or vaginal discharge. Only recently have serological tests using micro- techniques become available for an increasing number of STDs.

To quantify the problem in terms of prevalence of STDs and the related risk for the mother developing puerperal sepsis, and of the child with regard to congenital and neonatal infection, the pregnant women attending ANC were investigated. The data are part of a larger investigation of socioeconomic factors associated with the prevalence and transmission of STDs and cervical cancer among 2111 Ethiopian women conducted in 1975.

Permission to carry out the study and to send patient data, sera and cytological slide preparations to Europe for processing was given by the Ministry of Health of Ethiopia.

Methods

A total of 2111 Ethiopian women attending clinics in two teaching hospitals and an MCH clinic in Addis Ababa were enrolled in this

Table 1: **Distribution of pregnant women by clinic**

Clinic	No. seen	No. pregnant*
Antenatal	342	342
Postnatal	106	0
Family planning	542	8

Gynaecological	1121	184
Total	2111	534

*no refers only to the women attending the ANC

cross-sectional study (Table 1), after giving informed verbal consent. Pregnant women attending the ANC regularly were entered in the study on the basis of first come first to register for the clinic without other criteria for pre-selection. None of those invited to take part refused to do so.

Details regarding the study number and patient criteria, collection of data, serum storage and timing of testing are recorded elsewhere (10). The collection of data, cytology slides and sera, and the VDRL test were made during an eight month period in 1975 and 1976 while ethnic and socioeconomic factors could be assessed independently of, population migration as occurred during the revolution. In brief:

Patient socio-economic data was collected by means of questionnaire completed, in private, by an Ethiopian female assistant, in Amharic with translation into other languages if required.

Clinical data including the cytological smears and blood samples, were obtained by two physicians. Particular attention was paid to the state of the cervix and for evidence of upper and lower genital tract infection, 11 involving the urethra (U), salpinges (S) and Bartholin glands (B) which were inspected (U,B) and palpated (U,S,B) (11).

Cervical cytological data for cancer cells, excessive numbers of polymorphonuclear (PMN) cells (evidence of cervical infection), and for presence of trichomonas and monilia hyphae (evidence of heavy vaginal infection involving the cervix) were obtained from Papanicolaou stained smears examined in Liege by a physician.

Serological tests for syphilis were carried out in Addis Ababa using VDRL; in Edinburgh for syphilis using TPHA (12) and hepatitis B virus (HBV) (13); in London for herpes simplex virus (HSV2) (14) and Chlamydia trachomatis D-K (CTD-K) and Lymphogranuloma venereum 1-3 (LGV) (15); in Copenhagen for N. gonorrhoeae (gonococcal antibody test (GAT) (16); and in Antwerp for Haemophilus ducreyi (17,18).

Statistical methods: Data were stored and computed in Liege by G. Tibaux. Statistical analysis was made using the Chi-square and Cochran-Mantel-Haenszel General Association Statistic (19).

Results

Sociodemographic data of women attending ANC are shown in Table 2. The prevalence of antibodies showing exposure to specific STD pathogens in pregnant women attending ANC is shown in Table 3 (syphilis (TPHA) 27%, (VDRL) 28%; gonorrhoea (GAT) 43% ; genital chlamydiae 54%; HBV 37%; HSV-2 35%; H ducreyi 10%). Of particular interest is the prevalence of high titre seropositivity suggestive of active infection: gonorrhoea 10%, genital chlamydiae 31%, HSV-2 19%; also HBV SAg 5% and HBeAg 4%. All these infections are likely to be transmitted to the foetus in utero or during delivery.

Palpable thickening of urethra, salpinges and Bartholin glands with/without tenderness was regarded as evidence of present/past genital infection (II). Assessment of Fallopian tubes by palpation was only possible up to 14-16 weeks gestation. Clinical evidence of PI was 23% overall, chiefly due to urethritis, although five women with a normal pregnancy had acute salpingitis, and 3% had oophoritis (Table 3).

Cervical cytology revealed no cervical cancer among ANC attendees, but 36% had grossly infected slides indicative of cervicitis, 20% had T. vaginalis in the smear indicating presence of a severe vaginal infection.

Table 2: Socio-demographic status of ANC attendees

	No	(%)
Ethnic group		
Amhara	188	(56)
Oromo	41	(12)
Gurage	69	(20)
Tigre	28	(8)
Other*	14	(4)
Total	340	
Religion		
Ethiopian Orthodox	301	(89)
Moslem	36	(11)
Origin		
Urban	312	(92)
Rural	28	(8)

Age		
<20	49	(15)
20-24	106	(31)
25-29	95	(28)
30-34	57	(17)
35-39	22	(7)
40-49	7	(2)
>50	0	
Parity		
0	90	926)
1	64	(19)
2	56	(16)
3-5	84	(25)
6-10	48	(13)
>10	2	(1)

* 50% (36/72) were Moslem

NB. of women attending ANC, only 27 (8%) had used any form of contraception: 25 pill, 2 IUCD

Only 10% of ANC at tenders had no serological evidence for any STD: 72% had serological evidence of two or more STDs. (Table 4).

The chief complaints among ANC at tenders were due to the discomfort of late pregnancy, in three cases to onset of labour in the former group and to abortion in the second group (Table 5). The majority of ANC attenders were seen in the third trimestre of pregnancy, Among conditions requiring treatment (Table 6) vaginitis was the most important, chiefly due to trichomonal or monilial infection, Despite the frequency of this condition it was noted that few ANC attenders (4%) complained of vaginal discharge,

Discussion

Epidemiological surveys in selected population groups yield useful data on STDs prevalence in the community in which antenatal patients are considered as a 'normal risk' group (20) of healthy women of reproductive age group. Hence the high exposure to STDs detected among ANC attenders must be of concern, as they reflect the relative prevalence of STDs in the community. The higher seroprevalence of STDs in pregnant women attending GOPD may reflect the socioeconomic profile of these women. Of particular concern to obstetricians and neonatologists is the risk to the mother of puerperal sepsis (2,21), and vertical transmission to the foetus in utero or during parturition.

Prevalence rates for syphilis among African pregnant women are high (22,31). The high prevalence of reactive serological tests for syphilis in this study indicates not only that the prevalence in the community is high, but also that antenatal screening and treatment for this disease is essential. Syphilitic infection in the mother may result in abortion, intrauterine death, intrauterine growth retardation (IUGR) and congenital syphilis. With highly endemic maternal syphilis, congenital syphilis causes foetal and perinatal death in up to 40% of the infants affected. Rates for congenital syphilis are 850/100,000 live births in Lusaka and 3,200/100,000 in Addis Ababa (32,8) treatment of syphilis in pregnancy is normally based on positive specific serology. If, however, facilities are not available to confirm or disprove the positive non-specific test (VDRL) treatment is normally given without confirming the diagnosis. In areas of high prevalence, particularly where there is past history of abortion or unexplained perinatal death (including macerated foetuses), it is suggested that routine penicillin prophylaxis is not only justifiable (33) but that mass treatment with a single dose regimen of penicillin of all clinic attenders would be cost effective, leaving clinic staff free to investigate the high risk groups (22). Without simultaneous treatment of infected sexual partners, reinfection would be likely and high prevalence (25%) of congenital syphilis may still be found (30).

In Ethiopia, 21 % of children of seropositive mothers developed signs of syphilis, while the stillbirth and abortion rate of infected women was almost double that of the normal clinic population (7) .A contemporaneous study to this one found that syphilis was the fourth most common cause of perinatal death and accounted for 10% of the 70 perinatal deaths per 1000 births and almost 5% of all postneonatal deaths (34).

Table 3: Sexually transmitted diseases and gynaecological conditions in ANC attenders

Diagnosis	No teste	No Positive	(%)
Syphilis (TPHA)	307	83	27
Syphilis (VDRL)	314	84	27
			43
N. gonorrhoeae (GAT)	308	131	10
*Titre $\geq 1/320$	308	32	
C. trachomatis			
(D-K & LGV 1-3)	306	164	54
*Titre $\geq 1/64$	306	96	31
			37
Hepatitis B virus	309	113	5
			35
HBV Sag positive	309	16	19
HSV 2	306	108	10
			10
*Titre $\geq 1/128$	306	59	
H. ducreyi	306	32	
#Seronegative	342	33	
Cervical cytology			
infection	298	107	36
Trichomoniasis	298	60	20
PID (BUS)	339	79	23
Bartholinitis	339	11	3

Urethritis	339	73	22
**Salpingitis	339	5	1

No. = number Treponema pallidum haemagglutination assay
GAT = gonococcal antibody test HSV 2 = Herpes simplex virus 2
PID = pelvic inflammatory diseases B = Bartholinitis
U = Urethritis S = Salpingitis
High titre indicates present or active infection
#Seronegative = Women with no serological evidence for any of the
STDs shown above
** Salpingitis could only be assessed on those with pregnancy <14-16 weeks.

In Zambia congenital syphilis/syphilitic infection is implicated in 20-30% of the total perinatal mortality which is 50 per 1000 births (35). Additionally 19% of miscarriages in Zambia are attributed to syphilis (36), while there is a 28-fold increased risk for stillbirths among women with RPR seroreactivity at titre > 1/23 24). Almost 9% of the infants under three months of age admitted to hospital and 7.5 % of neonates admitted to intensive care units had congenital syphilis (28).

The 43% GAT seropositivity in normal risk Ethiopian women indicates a high level of gonococcal infection in the community. The 10% seropositivity at titre $\geq 1/320$ indicative of active infection is comparable to 9% culture positivity found in parturient women (9,11), and to the prevalence reported from many sub-Saharan countries (35,37-40).

Gonococcal infection in the mother, usually asymptomatic, is found in the endocervix, urethra and Bartholin glands. Acute gonococcal salpingitis may occur in the first trimester and simulate the signs and symptoms of ectopic pregnancy. The significance of a high level of infection in parturient women is the subsequent development of puerperal sepsis. N.gonorrhoeae is an important primary pathogen isolated from 18-34% of women with

Table 4: Seroprevalence of STDs among Antenatal Clinic attenders in Addis Ababa

Seroprevalence	ANC attenders	
	No	(%)
Negative (All STD)	33	(10)
Positive		
1 STD	60	(18)
2 STDs	74	(22)

3 STDs	73	(21)
4 STDs	49	(14)
5 STDs	18	(5)
6 STDs	35	(10)
Total	342	

Untreated antenatal maternal gonorrhoea is also important because of risk of contamination of the neonate during its passage down the birth canal. Gonococcal ophthalmia is an emergency condition requiring immediate treatment because of risk of corneal ulceration. Silver nitrate drops into each eye at birth is effective but may cause chemical conjunctivitis. Alternatives are 10% sulphacetamide drops, penicillin, chloramphenicol or tetracyclines eye ointment, the latter also being effective against ocular but not pharyngeal *C.trachomatis* infection. In some developing countries, eye prophylaxis reduced the incidence of neonatal ophthalmia by 83% and 93% when using silver nitrate and tetracycline ointment, respectively (42).

Chlamydial serovars A-C, D-K and LGV are all sexually transmissible. The prevalence of antibody to genital chlamydiae (54%) in this study was very high: 31% had IgG titres $\geq 1/64$ or IgM titres $\geq 1/8$ indicating present/active infection (43). The role of genital chlamydial pathogens in the aetiology of pelvic infections is well established in industrialised countries, but a similar situation in developing countries has only recently been appreciated (44). For lack of reference, prevalence rates for *C.trachomatis* culture positive infections in pregnant African women (39,45-48) are similar to those for *N.gonorrhoeae*. The prevalence rates of 27- 71% diagnosed by serology without giving high titre seropositivity (49,50,25), or Chlamidiazyme tests (29) cannot be compared with the culture rates. Although the role of *C.trachomatis* as a pathogen in puerperal sepsis has not yet been established, suggestive evidence for this is that *C.trachomatis* has been isolated from 6- 7% of healthy postnatal African women (40,38) but 8-20% with puerperal sepsis (51,41,40). *C.trachomatis* does however cause post-abortal sepsis (52). *C.trachomatis* has replaced *N.gonorrhoeae* as the most important single etiological agent of neonatal infections, worldwide, causing up to 32% to all cases (2). The transmission rate from an infected mother to her newborn is 30- 45% for *N.gonorrhoea* and 30% for *C.trachomatis* (37,2).

Inclusion conjunctivitis, typically, develops within the second week of life; naso-pharyngitis, otitis media or afebrile pneumonia may occur 2-3 months after birth, associated with cough and marked tachypnoea. *C.trachomatis* has recently been reported to be the most common cause of ophthalmia neonatorum in The Gambia (33%), compared with *N.gonorrhoeae* (25%) (53). Prevention of infection of the newborn is based on the identification and treatment of the mother during pregnancy. Where the diagnostic methods/ facilities are lacking, empirical treatment is indicated for pregnant women whose male sexual partners have non- gonococcal urethritis (NGU). The

mother should be treated with erythromycin 500mg, twice daily for ten days: tetracyclines, the standard treatment for chlamydial infections in men, should be avoided if possible during pregnancy because of possible adverse effects on the foetus .

Table 5: Symptoms of ANC attenders

Symptom	Attenders at ANC	
	No	(%)
Number of women seen	342	
Pain/discomfort		
Abdominal	32	
Peliv	46	
Backache	11	
Other gynae. Pain	2	
Total	91	
Abnormal bleeding		
Amenorrhoea**	3	
Continuous bleeding	4	
Total	7	
Vaginal discharge	15	
Urinary symptoms		
Dysuria	9	
δ Frequency	0	
Total	9	

* Percentage of total symptoms may be misleading, as sme patients had more than one.

** These women did not realise that they were pregnant.

δ Unusually there were no complaints of frequency.

Maternal herpes infection during pregnancy has been associated with spontaneous abortion, congenital malformations of the central nervous system (CNS) and prematurity, while neonatal infections caused by HSV2 transmitted during the second stage of labour affect predominantly the skin and CNS. In industrialised countries, if the virus is known to be present in the genital tract at or near term, elective Caesarean, section is recommended (1). Apart from this study the only record of the prevalence of HSV2 in pregnant women in Africa is 53% in the Gambia (54). Congenital infection is rare in some developing countries because HSV 1 and HSV2 infections are almost universal in childhood, and women are immune to the viruses by the time they become pregnant.

Hepatitis B is endemic in Ethiopia, with regional variations (55). The prevalence among ANC attenders (HBV 37% (all markers), 5% HBsAg and 4% HBeAg) is at the lower end of the population ranges reported for both Ethiopia (56) and elsewhere (24,25,45,57). Where risk of vertical transmission is most important, vaccination of babies born to HBsAg positive mothers should be adequate.

However, where horizontal transmission may present an equally significant risk, ideally, all babies should receive active vaccination at birth. The cost of such a programme makes it a practical proposition only for a very few who are rich. (58). In Ethiopia, where hepatitis is the most important non-obstetric cause of maternal mortality (59), there were 93 cases with 31 maternal deaths (3.9/1000 deliveries) in 1973-74 (60): the mortality rate in 1973 rose to 43% during the third trimester while the known foetal wastage was 60% for those delivering in hospitals (58).

The risk to the mother of *H. ducreyi* infection is of developing genital ulcerative disease which would predispose to infection with HIV. In turn HIV could be transmitted to the foetus in utero. Apart from this, other possible risks to the neonate from maternal med. infection are at present unknown, and require further investigation.

Trichomoniasis, although common among Ethiopian pregnant women, the prevalence being in the middle of the reported range from other African countries (14-49%) (41,45,53,61,62), caused little symptomatic vaginitis. However as trichomonas can also be found in the urethra and Skene's glands, the symptoms may be confused with those of bacterial urinary tract infection. Probably the most important effect of the infection is the alteration of the vaginal pH, thus interfering with defence mechanisms in the vagina (33). The 2 g stat dose of metronidazole administered in the ANC (63) has revolutionised the treatment of what can be a troublesome and distressing condition.

This study has shown that women attending ANC in Addis Ababa in 1975/76 had a high prevalence of STDs. STDs can affect the mother, as well as putting the foetus and neonate at risk because of intrauterine or intrapartum transmission of infection. The high prevalence among ANC attenders also reflects the relative prevalence of STDs in the community. It has taken the emergence of HIV/AIDS, a fatal STD, to highlight the problems of STDs across Africa and the need to understand the epidemiology of these conditions, and to control transmission

Table 6: **Obstetric diagnosis and conditions requiring immediate treatment in women attending ANC**

Condition	Number
Number of women seen	342
In labour	3
with medical, gynaecological or Obstetric complication	27
UTI (upper)	5
Urethritis	15
Vaginitis	71
Cervicitis (acute)	3
Salpingitis	
Acute/chronic	4
Bartholin	
Cyst/abscess/infection	3
Abortion	1

by all means that are socially and culturally acceptable. Because of the mothers' concern for a healthy baby, screening and treating pregnant women and their husbands/sexual partners is recommended as a first step prevention of STDs among ANC attenders and must be a high priority for health care providers and administrators. Awareness of SAD as a problem, and understanding of the mode of transmission is essential. Education for STD prevention requires sensitivity as well as cultural attitudes and beliefs,," some African languages STDs are translated as women's diseases. Withholding details of the diagnosis in the mother or child until the male partner/father has been tested, to inform him of his (positive) result before his wife is given her result has been found to be an effective way of dealing with this misconception. Ultimately the best prevention is fidelity in stable closed heterosexual relationships (64) with barrier methods for those involved in prostitution for economic survival. Such methods will result in the control of SAD, HIV/AIDS in particular.

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