

Sexually transmitted diseases among women with habitual abortion

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الأمراض المنقولة جنسياً بين المصابات بالإجهاض المتكرر
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خلاصة : تم استقصاء الأمراض المنقولة جنسياً بوصفها عامل خطر يعرّض للإجهاض المتكرر ، وذلك في دراسة أجريت في البصرة على حالات وشواهد ، فيما بين تشرين الأول/أكتوبر 1994 وأيار/مايو 1995 . ومن بين 81 مريضة بالإجهاض المتكرر ، وجدت 41 حالة (50.6%) مصابة بمرض منقول جنسياً . أما في مجموعة الحمل السوي فقد تبين أن 64 من أصل 119 امرأة (53.8%) كنّ مصابات بمرض منقول جنسياً ($\chi^2 = 0.712$ و $P < 0.05$) . وقد وُجد أن معدلات استفراء (جزل) أنواع المبيضات والشعرات المهبلية والغاردنريلا المهبلية والتيسرية السيلانية لم تكن بين المصابات بالإجهاض المتكرر ، تختلف كثيراً عنها بين ذوات الحمل السوي . ولم يتضح أن هناك ارتباطاً بين وجود الأمراض المنقولة جنسياً وبين الإجهاض المتكرر ($OR = 0.9$) . ولم تشخص أي حالة إيجابية للسفلس بعد إجراء اختبار VDRL واختبار TPHA . وتبين وجود علاقة يعتمد بها إحصائياً بين وجود مرض منقول جنسياً وبين وجود نيج (إفراز) مهلي ، وكانت درجة التركيز الأيوني بالهبل PH تزيد عن 4.5 ، وكان تواتر النشاط الجنسي يزيد عن مرتين في الأسبوع .

ABSTRACT Sexually transmitted disease as a risk factor for habitual abortion was investigated in a case-control study in Basra between October 1994 and May 1995. Of 81 women with habitual abortion, 41 (50.6%) had a sexually transmitted disease. In the normal pregnancy group, 64 of 119 women (53.8%) had a sexually transmitted disease ($\chi^2 = 0.712$, $P > 0.05$). The isolation rates of *Candida* spp., *Trichomonas vaginalis*, *Gardnerella vaginalis* and *Neisseria gonorrhoeae* in women with habitual abortion were not significantly different from those in normal pregnant women. No association was found between the presence of a sexually transmitted disease and habitual abortion (odds ratio = 0.9). No positive case of syphilis was diagnosed using VDRL and TPHA tests. There was a significant relation between the presence of a sexually transmitted disease and the presence of vaginal discharge, vaginal pH > 4.5 and the frequency of sexual activity/week > 2.

Les maladies sexuellement transmissibles chez les femmes ayant eu des avortements à répétition

RESUME Les maladies sexuellement transmissibles en tant que facteur de risque d'avortement à répétition ont fait l'objet d'une analyse dans le cadre d'une étude cas-témoin réalisée à Bassora d'octobre 1994 à mai 1995. Sur les 81 femmes ayant eu des avortements à répétition, 41 (50,6%) avaient une maladie sexuellement transmissible. Dans le groupe des femmes ayant une grossesse normale, 64 femmes sur 119 (53,8%) avaient une maladie sexuellement transmissible ($\chi^2=0,712$, $P>0,05$). Les taux relatifs à l'isolation de *Candida* spp., *Trichomonas vaginalis*, *Gardnerella vaginalis* et *Neisseria gonorrhoeae* chez les femmes ayant eu des avortements à répétition n'étaient pas significativement différents de ceux des femmes ayant une grossesse normale. Aucune association n'a été établie entre la présence d'une maladie sexuellement transmissible et des avortements à répétition (risque relatif approché =0,9). Aucun cas positif de syphilis n'a été diagnostiqué à l'aide des tests VDRL et TPHA. Il n'y avait pas de relation significative entre la présence d'une maladie sexuellement transmissible et la présence d'un écoulement vaginal, un pH vaginal supérieur à 4,5 et la fréquence d'une activité sexuelle hebdomadaire supérieure à deux rapports.

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Introduction

The causes of habitual abortion can be fetal and maternal [1]. It is likely that transplacental infection leads to chorioamnionitis, release of prostaglandins and preterm uterine activity [2]. Failure to give adequate and prompt care to these cases may result in considerable human loss.

There are several sexually transmitted diseases (STD), but gonorrhoea and syphilis are particularly important because of their high prevalence and morbidity. They are well recognized causes of fetal death *in utero*, low birth weight and severe diseases in neonates [3,4]. Many other infectious agents, particularly *Gardnerella vaginalis*, *Trichomonas vaginalis* and *Candida* spp., have been recognized as causes of STD. *Chlamydia trachomatis* infection is acquired through sexual contact, and recovery rates of 18%–37% have been reported from women attending sexually transmitted disease clinics [5]. The highest isolation rates (64%–72%) have been found in women harbouring gonococcus or who are known contacts of men with chlamydial urethritis [2,6]. Since chlamydial agents may cause abortion in several animal species, it may [2,5] or may not [7] have a role to play in spontaneous human abortion.

The population at risk of STD has risen and, therefore, public concern about these diseases has greatly increased and has provided momentum to STD research. To the best of our knowledge, this study is the first attempt in Iraq to assess the possible role of maternal infection with sexually transmitted agents among women with habitual abortion.

Subjects and methods

Subjects

This case-control study was carried out on 200 women attending the outpatient gynae-

logical clinic of Basra Maternity Hospital and antenatal care clinic in Hay Al-Shuhada health centre between October 1994 and May 1995. They comprised 81 women with habitual abortion and 119 pregnant women who did not have any history of abortion. Their ages ranged from 15 years to 45 years.

Clinical examination of the vulva and vagina was carried out and two vaginal swabs were obtained from each woman.

Laboratory diagnosis

One swab was used to recover *T. vaginalis* by wet preparation and culture methods. Cultures were carried out on *Trichomonas* broth, incubated at 37 °C and examined at 48 hours, then daily for 5 days.

Vaginal pH measurement was made by dipping a piece of Whatman pH paper into the vaginal discharge on the speculum. The amine or sniff test was carried out by adding a drop of 10% potassium hydroxide to the discharge.

The other vaginal swab was collected in Stuart medium and inoculated directly onto chocolate agar, Thayer–Martin medium and Sabouraud dextrose agar. The inoculated culture plates were incubated at 37 °C for 48 hours. The Sabouraud agar plate was incubated aerobically. Chocolate and Thayer–Martin plates were incubated anaerobically. Also, a Gram-stain smear was prepared from the swab and examined for Gram-positive and Gram-negative organisms and yeast.

Serological test for syphilis

Sera were separated by blood centrifugation at 3000 rpm for 5 minutes. Samples were stored at –20 °C until needed. They were screened for syphilis using the VDRL test and confirmed by TPHA test.

Statistical analysis

The chi-squared (χ^2) test or, where appropriate, the SND test was used as a test of signif-

ificance. Differences were recorded as significant whenever probability (P) was less than 0.05. In addition, the odds ratio and 95% confidence intervals of odds ratio were estimated for a single 2×2 table (to determine whether there was a crude disease-exposure association).

Results

The main characteristics of the group with habitual abortion and the normal pregnancy group are compared in Table 1. Of the 81 patients with habitual abortion, 41 (50.6%) had an STD. In the normal pregnancy group, 64 of

119 women (53.8%) had an STD. This relationship was not statistically significant ($\chi^2 = 0.712$, $P > 0.05$) (Table 2). The distribution of sexually transmitted microorganisms in both groups as well as the non-sexually transmitted microorganisms from the vaginal swabs is shown in Table 3.

There was no positive case of syphilis diagnosed among the 200 sera samples examined from both groups.

The prevalence of STD among women in this study was not statistically significant in relation to age, occupation and economic status (Table 4). However, 76% of women who presented with vaginal discharge had an STD, while 20.9% of women with no vaginal

Table 1 Characteristics of women included in the study

Characteristic	Habitual abortion group ($n = 81$)		Normal pregnancy group ($n = 119$)	
	No.	%	No.	%
<i>Age (years)</i>				
15-24	29	36	51	43
25-34	30	37	52	44
35-45	22	27	16	13
Mean \pm s:	29 \pm 7.9 ^a		27 \pm 6.93	
<i>Parity</i>				
0-3	50	62	70	59
3-7	25	31	39	33
8-12	6	7	10	8
Mean \pm s:	3.83 \pm 2.5 ^b		3.98 \pm 2.6	
<i>Occupation</i>				
Working	14	17	9	8
Not working	67	83	110	92
<i>Education</i>				
Low	61	75	94	79
Moderate-high	20	25	25	21
<i>Economic status</i>				
Low	16	20	50	42
Moderate	55	68	60	50
High	10	12	9	8

^a $SND = 1.85$; $P > 0.05$

^b $SND = 0.41$; $P > 0.05$

s = standard deviation

Table 2 Prevalence of sexually transmitted diseases (STD) in different groups of subjects

Presence of STD	Habitual abortion group		Normal pregnancy group		Total
	No.	%	No.	%	
Present	41	50.6	64	53.8	105
Absent	40	49.4	55	46.2	95
Total	81	100	119	100	200

$\chi^2 = 0.712$; $P > 0.05$

Odds ratio = 0.9; 95% confidence interval = 0.22-0.42

Table 3 Prevalence of microorganisms isolated from vaginal swabs

Microorganism	Habitual abortion group		Normal pregnancy group	
	No.	%	No.	%
STD agents				
<i>Candida</i> spp.	24	29.6	37	31.1
<i>Trichomonas vaginalis</i>	9	11.1	13	10.9
<i>Gardnerella vaginalis</i>	5	6.2	9	7.6
<i>Neisseria gonorrhoeae</i>	3	3.7	5	4.2
Subtotal	41	50.6	64	53.8
Others				
<i>Staphylococcus</i> spp.	5	6.2	10	8.4
<i>Streptococcus</i> spp.	2	2.5	2	1.7
Coliforms	4	4.9	6	5.0
<i>Lactobacillus</i> spp. and <i>Corynebacterium</i> spp.	29	35.8	37	31.1
Total	81	100	119	100

discharge (asymptomatic) had an STD ($\chi^2 = 52.6$, $P < 0.01$). The relationship was also significant in relation to vaginal pH and the frequency of sexual activity/week (Table 4).

Discussion

This study indicates that, despite the progress made in methods of diagnosis and treatment, STDs are now among the most common communicable diseases and constitute an important public health problem

among aborted as well as normal pregnancy women in the country.

Although the overall prevalence of *Candida* spp. in our study was 30.3%, there was no significant association between vaginal candidiasis and habitual abortion. *C. albicans* is the most common cause of vulvovaginitis in pregnancy. The presence of a glycogen-rich vaginal epithelium, because of increased estrogen production, or alterations in carbohydrate metabolism and reduction in cell-mediated immunity associated with pregnancy may play a role in the transition of

Table 4 Prevalence of sexually transmitted diseases in relation to selected variables

Variable	No. tested	No. positive	%	Test of significance
<i>Age (years)</i>				
15-24	80	40	50	$\chi^2 = 0.63$
25-34	82	43	52	$P > 0.05$ NS
35-45	38	22	58	
<i>Occupation</i>				
Working	23	10	43	$\chi^2 = 0.82$
Not working	177	95	54	$P > 0.05$ NS
<i>Economic status</i>				
Low	66	37	56	
Moderate	115	62	54	$\chi^2 = 3.87$
High	19	6	32	$P > 0.05$ NS
<i>Vaginal discharge</i>				
Yes	114	87	76	$\chi^2 = 52.6$
No	86	18	21	$P < 0.01$
<i>Vaginal pH</i>				
≤ 4.5	149	65	44	$\chi^2 = 26.3$
> 4.5	51	40	78	$P < 0.01$
<i>Frequency of sexual activity/week</i>				
≤ 2	119	54	45	$\chi^2 = 6.1$
> 2	81	51	63	$P < 0.01$

NS = not significant

the organism from a saprophyte to a pathogen [8,9].

Although the rate of *T. vaginalis* infection observed in this study had no association with habitual abortion, it still represents a high level from the public health point of view. Also some cases of *T. vaginalis* infection can be acquired through non-sexual means, such as toilet facilities, medical instruments or by sharing towels or underwear [10,11]. *T. vaginalis* is not implicated as a factor in abortion, premature labour and intrauterine growth retardation in many studies [12-14]. On the other hand, some researchers have reported a considerable association with premature rupture of membranes, preterm labour and low birth weight [3,15].

It has been reported that bacterial vaginosis may stimulate the premature rupture of membranes and preterm labour by inducing the synthesis and release of prostaglandins [16-18]. However, we found no association between bacterial vaginosis and habitual abortion.

There was no significant relationship observed between maternal *Neisseria gonorrhoeae* infection and habitual abortion. Similar observations have also been made in relation to spontaneous abortion [19]. However, some researchers have found that maternal gonococcal infection in the last trimester of pregnancy is associated with an increased incidence of premature rupture of the fetal membranes [20,21]. As almost all patients with gonococcal infection are

asymptomatic, these researchers recommend that routine cultures should be obtained at the initial prenatal visit as well as during the later weeks of pregnancy [21].

Untreated syphilis contracted 6–12 months prior to pregnancy usually results in midtrimester abortion or death of the fetus [22]. Therefore, routine serological screening for syphilis is an important aspect of antenatal care and as such should always be performed in early pregnancy. Higher seroreactivity rate to syphilis was reported among women with spontaneous abortion in Zambia [23] and Nairobi, Kenya [19]. In our study, the role of syphilis could not be deter-

mined because no sera were reactive to the VDRL and TPHA tests.

We found a highly significant increase in the prevalence of STD in the presence of vaginal discharge, vaginal pH > 4.5 and the frequency of sexual activity/week > 2. These results suggest that the frequency of STD is greater among sexually active women and among women with vaginal discharge, which is more likely to harbour infectious microorganisms. It has been reported that women with a vaginal pH \geq 4.4 were significantly more likely to carry *T. vaginalis*, *Bacteroides* spp. and non-specific vaginitis [15]. They were also more likely to have premature rupture of the membranes.

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