

Trichomoniasis and bacterial vaginosis in pregnancy: inadequately managed with the syndromic approach

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Objective To measure the prevalence of *Trichomonas vaginalis* (TV) infection and bacterial vaginosis (BV) among pregnant women in Botswana, and to evaluate the syndromic approach and alternative management strategies for these conditions in pregnancy.

Methods In a cross-sectional study, 703 antenatal care attendees were interviewed and examined, and specimens were collected to identify TV, BV, *Candida* species, *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Information on reproductive tract infections earlier in pregnancy was obtained from a structured interview and the antenatal record.

Findings TV was found in 19% and BV in 38% of the attendees. Three-fourths of women with TV or BV were asymptomatic. Syndromic management according to the vaginal discharge algorithm would lead to substantial under-diagnosis and over-treatment of TV and BV. Signs of vaginal discharge were more predictive of the presence of these conditions than were symptoms. Among the 546 attendees on a repeat antenatal visit, 142 (26%) had been diagnosed with vaginal discharge earlier in their pregnancy – 14 of them twice. In 143 cases, an attendee was diagnosed with vaginal discharge in the second or third trimester; however, metronidazole had been prescribed only 17 times (12%).

Conclusion Diagnosis and treatment of TV and BV among pregnant women in sub-Saharan Africa presents major challenges. Half the pregnant women in this study were diagnosed with TV or BV, but these conditions were not detected and treated during antenatal care with syndromic management. Also, health workers did not adhere to treatment guidelines. These results indicate that management guidelines for TV and BV in antenatal care should be revised.

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Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Trichomonas vaginalis (TV) infection is the most common curable sexually transmitted infection (STI) worldwide.¹ In studies of low-risk women in sub-Saharan Africa, the prevalence ranges from 10–31%.^{2,3} Bacterial vaginosis (BV) is a syndrome characterized by a shift in vaginal flora; it is particularly common in the sub-Saharan region, where prevalences up to 50% are not uncommon.⁴ These two vaginal conditions are thought to cause substantial morbidity among women in developing countries. Both infections have been linked to preterm delivery and low birth weight⁵ and, as reproductive tract infections (RTIs), they are likely to increase both infectiousness of HIV and susceptibility to the disease.^{6,7} It appears to be critical to diagnose and treat TV and BV in pregnancy, especially in high-prevalence settings.^{8,9}

There are few studies from developing countries on effective strategies to prevent the adverse outcomes associated with TV and BV in pregnancy. Systematic reviews from developed countries of antibiotic treatment for these conditions in asymptomatic pregnant women show no significant reductions in adverse pregnancy outcomes.^{5,10–12} However, antibiotic treatment for BV may reduce the risk of low birth weight and preterm rupture of the membranes among pregnant women with previous preterm deliveries.¹³ Provision of treatment for TV or BV in symptomatic pregnant women has not been adequately evaluated.^{11,12}

Diagnosis of TV and BV in women in sub-Saharan Africa is based on the vaginal discharge syndrome – the most common syndrome in the syndromic approach (i.e. treating symptoms and signs of disease based on the organisms most commonly responsible for

the particular syndrome). In the early 1990s, the World Health Organization developed syndromic management guidelines for symptomatic STI patients for countries without laboratory support. Easily recognized symptoms and signs are combined using flowcharts, and patients are then treated with two or more antibiotic regimens.¹⁴ In Botswana, women reporting vaginal discharge or lower abdominal pain are managed using the vaginal discharge algorithm.¹⁵ Based on a risk assessment and clinical signs, the women are provided with treatment for TV and BV and/or chlamydia and gonorrhoea and/or candidiasis. Where a woman has chlamydia and gonorrhoea, partner treatment is always recommended; however, where a woman has TV, partner treatment is only recommended if the woman's symptoms persist.

For pregnant women, the Botswana STI manual states that asymptom-

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atic women with a history of previous preterm delivery should be examined for vaginal discharge to detect and treat BV.¹⁵ Syndromic management of asymptomatic antenatal care attendees in general is not recommended in either the national or the World Health Organization's STI management guidelines. In practice, however, all antenatal care attendees in Botswana are clinically screened for RTIs because the country's antenatal care guidelines recommend a routine speculum examination at the first antenatal visit to "exclude genital infections, abnormalities and pelvic tumours".¹⁶ It is not uncommon for abnormal vaginal discharge to be found in women not displaying symptoms. The nurses will act on pathological findings, and asymptomatic women with signs of vaginal discharge are thus provided with syndromic treatment. This management bypasses the original entry point of the syndromic algorithms: symptoms that lead patients to seek health care.

The aim of this paper is to present results on the prevalence of TV and BV among antenatal care attendees in Botswana, to examine the use of the vaginal discharge algorithm earlier in the current pregnancy, and to evaluate the syndromic approach and clinical screening in the diagnosis of these two conditions in pregnancy.

Methods

A total of 703 pregnant women participated in this study. The women were selected from those visiting the 13 main facilities providing antenatal care (12 primary health clinics and one outpatient department) in Gaborone, Botswana, between October 2000 and February 2001. A proportionate sample of attendees was recruited from each location, based on the percentage of all antenatal care attendees who attended that facility the previous year. In most clinics, all attendees were included in the data collection; a sample of the attendees was included from the busiest clinics. All participants gave written, informed consent; the study was approved by the national committees for research ethics in Botswana and in Norway. The only exclusion criterion was the use of antibiotics during the previous two weeks.

A structured interview and data from the patient-held antenatal record were used to obtain information on sociodemographic factors, current RTI symptoms, and diagnosis and

prescribed treatment for RTIs earlier in the pregnancy. All attendees underwent a genital examination by a medical doctor, and clinical signs from external and internal genitalia were recorded. Amount, consistency, colour and odour of vaginal discharge were described and categorized as "normal", "*Candida*-like" or "non-*Candida*-like" discharge.

One high vaginal swab was placed in Stuart transport medium; another was used for a vaginal smear. Specimens were transported at ambient temperature to the National Health Laboratory for further processing. Wet-mounts made from the swabs in transport media were examined for motile trichomonads by light microscopy. The swabs were then agitated into bottles of Diamond's modified medium, the bottles were incubated in Oxoid gaspack jars, and wet-mounts were examined for trichomonads once daily for up to five days. The vaginal smears were Gram-stained and scored for BV according to Nugent's criteria¹⁷ by an experienced laboratory technician.

Culture of *Candida* species was initiated by direct inoculation of Saboraud plates at the clinic, incubated at 35 °C (5% CO₂), and examined after 24 and 48 hours. Smears of colonies from positive cultures were Gram-stained and examined for budding yeast cells and pseudohyphae. The wet-mounts and Gram-stained smears were also examined for *Candida*. Presence of *Candida* was verified by positive growth and/or microscopy. Cervical swabs were obtained for ligase chain reaction (LCR) amplification, for direct, qualitative detection of specific target nucleic acid sequences of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.¹⁸

Data were analysed using the statistical package SPSS, Version 11. To evaluate the clinical diagnosis of TV and BV, univariate logistic regression analyses were used to assess the association between laboratory-verified diagnoses and genital symptoms and signs. Sociodemographic risk factors and genital symptoms and signs that, in univariate analysis, were associated at a 0.2 level (*P*-value of odds ratios [OR]), were included in multivariate logistic regression analysis. Validity of the vaginal discharge algorithm and of the clinical screening were assessed by measuring sensitivity, specificity, positive and negative likelihood ratios (LR+ and LR-), and positive and negative predictive values, using the laboratory diagnosis of TV and BV as the reference standard.

Results

General characteristics

The median age of the 703 antenatal care attendees was 25 years (range of 15–43) and median gestational age 30 weeks (range of 8–42). Selected background characteristics, genital symptoms and signs, and the prevalence of RTIs are shown in Table 1. TV and/or BV was present in 359 (51%) of the women, *Chlamydia* and/or gonorrhoea in 67 (10%), and *Candida* species in 416 (59%). Among the 132 women with TV, 100 (76%) reported no symptoms of vaginal discharge or lower abdominal pain. Among the 268 women with BV, 205 (76%) were asymptomatic.

Vaginal discharge and its association with TV and BV

Table 2 (available at <http://www.who.int/bulletin>) shows selected genital symptoms and signs, and their univariate association with TV and BV. Of the symptoms, only vaginal discharge was associated with TV, albeit weakly (OR 1.6; 95% confidence interval (95%CI), 1.0 to 2.5), and only in the univariate analysis. None of the genital symptoms evaluated were significantly associated with BV. Vaginal discharge and genital itching were, however, significantly associated with *Candida* species. *Candida* was identified in 84 (71%) of the 119 women with symptoms of vaginal discharge, compared with 332 (57%) of the 585 women without this symptom (*P*<0.01).

In the clinical evaluation of the discharge, non-*Candida*-like vaginal discharge was associated with increased prevalence of TV and BV, whereas *Candida*-like discharge was not (Table 2, available at <http://www.who.int/bulletin>). Runny, frothy and malodorous discharges were strongly associated with both TV and BV; results from women with one or more of these discharge characteristics were OR 7.1 (95%CI, 4.7 to 10.8) for TV, and OR 3.3 (95%CI, 2.3 to 4.8) for BV. Adjusted odds ratios are shown in Table 3.

Table 4 compares the diagnostic accuracy of the vaginal discharge algorithm, screening for signs of vaginal discharge and for specific discharge characteristics. The vaginal discharge algorithm failed to detect most cases of TV and BV. Also, women diagnosed by the algorithm as diseased were not significantly more likely to have TV and BV than women not diagnosed

as diseased (LR+ 1.35; 95%CI, 0.97 to 1.89).

Signs of non-*Candida*-like vaginal discharge gave an LR+ of 3.00 (95%CI, 2.31 to 3.92) in the diagnosis of the two conditions combined. Screening the women for specific discharge characteristics increased the LR+ to 6.66 (95%CI, 4.25 to 10.5), but also increased the proportion of undetected infections.

Diagnosis and treatment of vaginal discharge earlier in current pregnancy

An indicator of effectiveness of the current RTI management in antenatal care is the prevalence of infections among the repeat attendees because, unlike new attendees, they have already been provided with standard care. TV prevalence was 15% for new and 20% for repeat attendees ($P=0.22$) and BV prevalence was 41% for new and 37% for repeat attendees ($P=0.44$).

Among the 546 repeat attendees, 142 (26%) had been diagnosed with vaginal discharge earlier in their current pregnancy – 14 of them twice. Prevalence of TV and BV was similar, whether or not the women had a history of vaginal discharge.

Treatment guidelines for vaginal discharge were usually not followed appropriately. At the time of the study, the recommended regimen to cover TV and BV was 400 mg metronidazole twice daily for 7 days; treatment for these conditions in the first trimester of pregnancy was not recommended. Consistent with the guidelines, metronidazole had not been prescribed to any of the 13 women diagnosed with vaginal discharge in the first trimester. In 143 cases, however, attendees were diagnosed with vaginal discharge in the second or third trimester, but metronidazole had been prescribed only 17 times (12%).

Of the 17 attendees for whom metronidazole was prescribed, none had TV, compared to 132 (19%) of the 686 women who had not been prescribed the drug ($P<0.05$). Three (18%) of the 17 attendees had BV, compared to 265 (39%) of the women who had not been prescribed metronidazole ($P>0.1$).

Discussion

In our study of RTIs in pregnant Batswana women, we found high prevalence of TV and BV, and no indication

Table 1. Background characteristics, genital symptoms and signs and prevalence of reproductive tract infections (RTIs) among 703 antenatal care attendees in Gaborone, Botswana

Characteristics	n	(%)
Age groups		
15–19	76	(11)
20–24	249	(35)
25–29	183	(26)
30–34	126	(18)
35–43	69	(10)
Education		
Primary school or less	168	(24)
Junior secondary school	310	(44)
Secondary school or higher	225	(32)
Marital status		
Married	114	(16)
Non-marital steady partner	572	(81)
Single	17	(2)
Living with husband/partner	353	(50)
Not living with husband/partner	350	(50)
Pregnancy number		
1st pregnancy	243	(35)
2nd pregnancy	208	(30)
3rd pregnancy	122	(17)
4th+ pregnancy	130	(18)
Antenatal care visit number		
1st visit	157	(22)
2–4th visit	300	(43)
5th + visit	246	(35)
Self-reported symptoms of RTIs		
Vaginal discharge	119	(17)
Itching/soreness	58	(8)
Lower abdominal pain	53	(8)
Genital warts	16	(2)
Genital ulcer	8	(1)
Dysuria	8	(1)
Clinical signs of RTIs		
Vaginal discharge (not <i>Candida</i> -like)	227	(32)
<i>Candida</i> -like vaginal discharge	81	(12)
Genital warts	29	(4)
Genital ulcer	5	(1)
Presence of pathogens		
<i>Chlamydia trachomatis</i>	53	(8)
<i>Neisseria gonorrhoeae</i>	21	(3)
<i>Trichomonas vaginalis</i>	132	(19)
Bacterial vaginosis	268	(38)
<i>Candida</i> species	416	(59)

that syndromic management reduces the prevalence of these conditions. The vaginal discharge algorithm was extensively used by the health workers, but had low accuracy in diagnosing TV and BV. In addition, staff often did not adhere to treatment guidelines. TV and BV may contribute substantially to the risk of preterm delivery, low birth weight and

increased HIV transmission in sub-Saharan Africa. Apparently, diagnosis and treatment strategies for TV and BV among pregnant women in this setting require reconsideration.

The study population is representative of antenatal care attendees in Gaborone. The level of health care is comparable throughout Botswana, and

Table 3. Univariate and multivariate logistic regression analyses^a of determinants of trichomoniasis and bacterial vaginosis among 703 antenatal care attendees in Gaborone, Botswana

	Trichomoniasis		N	Crude odds ratio (95% confidence interval)	Adjusted odds ratio (95% confidence interval)
	% Positive (n = 132)	% Negative (n = 571)			
Sociodemographic factors					
Age groups					
< 20	20	9	76	4.55 (2.35–8.82)	7.05 (3.23–15.37)
20–29	65	61	432	2.18 (1.29–3.66)	3.00 (1.66–5.43)
30+	15	31	195	1	1
Education					
Primary school or less	30	23	168	2.65 (1.52–4.65)	5.25 (2.75–10.02)
Junior secondary school	54	42	310	2.56 (1.54–4.25)	2.68 (1.56–4.60)
Senior secondary or higher	17	35	225	1	1
Antenatal care visit					
New client	17	24	157	1	1
Repeat client	83	77	546	1.45 (0.89–2.37)	1.67 (0.98–2.85)
Symptoms					
More discharge than usual					
No	77	84	584	1	1
Yes	23	16	119	1.59 (1.00–2.54)	1.09 (0.63–1.87)
Clinical signs					
Vaginal discharge					
Negative	36	61	395	1	1
<i>Candida</i> -like discharge	3	14	81	0.38 (0.13–1.07)	0.32 (0.11–0.96)
Other vaginal discharge	61	26	227	3.93 (2.62–5.91)	3.61 (2.31–5.65)
Bacterial vaginosis					
	% Positive (n = 268)	% Negative (n = 435)			
Sociodemographic factors					
Age groups					
< 20	14	9	76	2.10 (1.22–3.60)	1.73 (0.75–1.62)
20–29	62	61	432	1.32 (0.92–1.89)	1.10 (0.75–1.62)
30+	24	30	195	1	1
Marital status					
Unmarried	88	81	589	1.63 (1.05–2.52)	1.37 (0.85–2.19)
Married	12	19	114	1	1
Symptoms					
Malodorous discharge					
No	94	96	671	1	1
Yes	6	4	32	1.66 (0.82–3.38)	1.34 (0.62–2.88)
Clinical signs					
Vaginal discharge					
Negative	50	59	395	1	1
<i>Candida</i> -like discharge	4	16	81	0.27 (0.14–0.54)	0.26 (0.13–0.52)
Other vaginal discharge	46	24	227	2.28 (1.63–3.18)	2.13 (1.51–2.99)

^a Only factors that were associated with the respective conditions at a 0.2 level (*P*-value of odds ratio) in the univariate analysis are presented in the table.

HIV prevalence among pregnant women is similar in urban and rural areas.¹⁹ Combined with an antenatal coverage of 95%, this situation leads us to believe that we present an accurate picture of management challenges of TV and BV in pregnant women in the country as a whole.²⁰

Clinical management of TV and BV in pregnancy

In antenatal care, health-care workers manage women who report vaginal discharge and women in whom vaginal discharge is found at the routine examination. The vaginal discharge algorithm recognizes that women reporting vaginal

discharge commonly suffer from TV, BV or vulvovaginal candidiasis and, in rarer cases, a cervical infection.^{21–23} Symptoms of vaginal discharge or lower abdominal pain are unspecific, especially in pregnancy, where physiological discharge and the presence of candidiasis increase. We found that TV and BV were equally

Table 4. Accuracy of the vaginal discharge algorithm, and of screening for signs of vaginal discharge or specific discharge characteristics, in the diagnosis of trichomoniasis and bacterial vaginosis among 703 antenatal care attendees in Gaborone, Botswana

	Confirmed infection (n)	Sensitivity	Specificity	LR+ ^a	LR–	PPV	NPV
Trichomoniasis (n = 132)							
VDS algorithm	28	0.21	0.84	1.35 (0.91–1.94)	0.93	0.24	0.82
Signs of vaginal discharge (other than <i>Candida</i> -like)	80	0.61	0.74	2.35 (1.92–2.85)	0.53	0.35	0.89
Signs of specific discharge characteristics (runny and/or frothy and/or malodorous)	71	0.54	0.86	3.84 (2.96–4.95)	0.54	0.47	0.89
Bacterial vaginosis (n = 268)							
VDS algorithm	50	0.19	0.84	1.19 (0.86–1.66)	0.96	0.42	0.63
Signs of vaginal discharge (other than <i>Candida</i> -like)	123	0.46	0.76	1.92 (1.55–2.37)	0.71	0.54	0.70
Signs of specific discharge characteristics	92	0.34	0.86	2.53 (1.90–3.38)	0.72	0.61	0.68
BV and/or TV (n = 359)							
VDS algorithm	69	0.19	0.86	1.35 (0.97–1.89)	0.94	0.59	0.50
Signs of vaginal discharge (other than <i>Candida</i> -like)	172	0.48	0.84	3.00 (2.31–3.92)	0.62	0.76	0.61
Signs of specific discharge characteristics	132	0.37	0.95	6.66 (4.25–10.5)	0.67	0.87	0.58

LR+, positive likelihood ratio; LR–, negative likelihood ratio; NPV, negative predictive value; PPV, positive predictive value; VDS, vaginal discharge syndrome.

^a The positive likelihood ratios are calculated with 95% confidence interval (score method).

common in both symptomatic and asymptomatic pregnant women, and that the algorithm was neither sensitive nor specific in the management of these conditions in pregnancy.

Candida species were common among the antenatal care attendees, strongly associated with symptoms of vaginal discharge, and probably the pathological cause most often leading to this complaint. *Candida* is not associated with any serious complications, and should therefore be treated only in symptomatic women. Conversely, identification and treatment of chlamydia and gonorrhoeae in pregnancy is critical. We have previously shown that the vaginal discharge syndrome is an inadequate management strategy for cervical infections in pregnant Botswana women.¹⁸

In this study population, clinical screening for signs of vaginal discharge at the first antenatal care visit appears to be more effective than the use of symptoms as an entry point for metronidazole treatment. The magnitude of undetected cases is the main challenge to clinical screening: six of ten attendees with TV and one of two with BV remained unidentified. However, using this approach, one of four women receiving metronidazole does so unnecessarily. Over-treatment could be substantially reduced by limiting metronidazole

prescriptions to women with runny, malodorous or foamy discharge. Different specific discharge characteristics have been associated with both TV and BV,²⁴ and it could be useful to employ these characteristics in settings where diagnostic tests are unavailable. However, discharge associated with the two conditions in this study population may not be applicable to other populations of pregnant women. Specific clinical criteria are diagnostically demanding for health-care workers, and if specificity increases, so does the proportion of undetected cases.

Studies among pregnant women in other developing countries have shown low correlations between symptoms and signs of vaginal discharge and the presence of TV or BV.^{25–28} With the development of molecular techniques to identify *Trichomonas vaginalis*, it has become evident that culture and microscopy miss a substantial proportion of the infections.^{29,30} This implies that the sensitivity of syndromic management for identifying TV is likely to be lower than estimated in this and other studies using traditional diagnostic techniques.

Adherence to the syndromic management treatment guidelines

As many as one of four pregnant women who had at least one encounter with the

antenatal services had been diagnosed with vaginal discharge syndrome. In most cases, the health workers had not prescribed metronidazole, although the availability of drugs is excellent in Botswana. This finding is consistent with another study on quality of STI management from primary health care in Botswana that showed substantial flaws in history-taking, clinical examination and prescriptions.³¹ A tendency to deviate from recommended RTI guidelines is common throughout the world.^{32–34} Adherence to clinical guidelines is notoriously difficult to achieve, even when intensively promoted.³⁵ The uncertainties of the vaginal discharge algorithm may discourage health workers from optimal performance, increasing the number of inadequate prescriptions and untreated infections.

Management of TV and BV in the antenatal care is further complicated by the situation regarding the advisability of using metronidazole in pregnancy.³⁶ Multiple studies and meta-analyses have concluded that metronidazole does not appear to be associated with an increased teratogenic risk.^{37–39} However, two studies have suggested that treatment with metronidazole in women with TV can increase preterm birth.^{40,41} This adverse effect has been difficult to explain, but raises a caution about the unnecessary use of metronidazole in pregnancy.

Revised guidelines in Botswana recommend metronidazole 2 g in a single dose to cover TV in pregnancy, and 250 mg three times daily for 7 days to cover BV.¹⁵ This management is based on evidence of optimal treatment effect for each condition, and would minimize metronidazole use in pregnancy if the women were treated for only one of the conditions.^{13,37,42} However, as an etiological diagnosis cannot be made in primary health care, this strategy requires the prescription of two regimens to pregnant women with vaginal discharge – a situation that is both confusing and unnecessary. According to recently updated guidelines from the Centers for Disease Control and Prevention, metronidazole 500 mg twice daily for 7 days is the only regimen which effectively treats both conditions.³⁷

Simple diagnostic tests to identify TV and BV

Accurate diagnosis and prompt treatment of STIs is important from a public health perspective, and this includes detection of asymptomatic cases. With the demonstrated shortcomings of the management of TV in Botswana, and the lack of treatment for partners of women whose symptoms do not persist, the high prevalence of TV is likely to continue.

A focus on the implementation of the syndromic approach may have superseded an exploration of the use of point-of-care tests for TV and BV in developing countries. Contrary to many other RTIs, simple and cheap tests for TV and BV are available. TV can be identified immediately with a simple latex agglutination test⁴³ or by saline wet preparation. BV can be diagnosed on-site, with or without the aid of a microscope.⁴⁴

Introduction of point-of-care tests for TV and BV in the antenatal care in countries where prevalences of RTIs and HIV are high requires further exploration. Antenatal screening would identify asymptomatic cases, and testing attendees with vaginal discharge would reduce over-treatment with metronidazole in pregnancy. Health workers' prescriptions and patients' compliance would probably improve with a specific diagnosis, and treatment regimens could be optimized. Treating sexual partners of women with vaginal discharge has been debated because the majority of the identified women do not have an STI.⁴⁵ An important benefit of testing for TV is the relative ease of notifying and treating partners of patients with a positive test.

Botswana has a relatively well-functioning health system and could serve as an exploratory site for the use

of point-of-care tests for TV and BV. Through the programme to prevent mother-to-child transmission of HIV, all health posts and clinics have lay workers who perform rapid tests for HIV. Simple tests for TV and BV performed by clinicians or lay workers could contribute to improving diagnosis and reducing the disease burden of these conditions in sub-Saharan Africa.

Conclusion

The inaccuracy of vaginal discharge in predicting pathological conditions in pregnancy and the magnitude of asymptomatic TV and BV is a challenge in developing countries, as is the quality of care provided. Guidelines are inadequate and there is a lack of adherence to guidelines by health workers. Our results from Botswana indicate that national health authorities should revise the diagnosis and treatment guidelines for TV and BV in antenatal care. Also, the results of this study may be useful in the process of continuous revision of World Health Organization guidelines for the management of these conditions in developing countries. ■

Competing interests: None declared.

Résumé

Insuffisances de l'approche syndromique pour la prise en charge de la trichomonase et de la vaginite bactérienne chez la femme enceinte

Objectif Déterminer la prévalence des infections à *Trichomonas vaginalis* (TV) et des vaginites bactériennes (VB) chez les femmes enceintes du Botswana et mener une évaluation comparée de l'approche syndromique et d'autres stratégies pour la prise en charge de ces pathologies pendant la grossesse.

Méthodes Dans le cadre d'une étude transversale, on a interrogé et examiné 703 femmes se présentant aux visites prénatales et on a prélevé chez elles des échantillons pour recherche de TV, d'une éventuelle VB, de *Candida*, de *Chlamydia trachomatis* et de *Neisseria gonorrhoeae*. Des entretiens structurés et l'exploitation des dossiers prénatals ont permis de recueillir des éléments sur les infections de l'appareil reproducteur survenues à un stade antérieur de la grossesse.

Résultats On a diagnostiqué une infection à TV chez 19% des femmes examinées et une VB chez 38% d'entre elles. Trois quarts des femmes atteintes d'infection à TV ou VB étaient asymptomatiques. Une prise en charge syndromique selon l'Algorithme pour les pertes vaginales de l'OMS aurait conduit à un sous-diagnostic notable de certaines pathologies et à un surtraitement des infections à TV et des VB. Les pertes vaginales

se sont révélées plus fortement prédictives de la présence de ces affections que les symptômes. Parmi les 546 femmes reçues dans le cadre des visites prénatales, 142 (26 %) avaient déjà été diagnostiquées comme présentant des pertes vaginales à un stade antérieur de la grossesse (à deux reprises pour 14 d'entre elles). On a relevé 143 cas de pertes vaginales au deuxième ou au troisième trimestres de grossesse parmi les femmes examinées lors de ces visites prénatales. Néanmoins, ces pertes n'ont donné lieu que 17 fois à la prescription de métronidazole (12 % des cas).

Conclusion Le diagnostic et le traitement des infections à TV et des VB chez les femmes enceintes d'Afrique subsaharienne présentent des difficultés majeures. Cette étude a conduit à diagnostiquer une infection à TV ou une VB chez la moitié des femmes enceintes, mais ces affections n'ont été ni détectées, ni traitées, par la prise en charge syndromique appliquée lors des visites prénatales. De même, le personnel soignant ne suivait par les recommandations thérapeutiques. Ces résultats témoignent de la nécessité d'une révision du Guide pour la prise en charge des IST à TV et des VB dans le cadre des soins prénatals.

Resumen

Tricomoniasis y vaginosis bacteriana en el embarazo: insuficiencias del manejo sindrómico

Objetivo Medir la prevalencia de la infección por *Trichomonas vaginalis* (TV) y la vaginosis bacteriana (VB) entre las embarazadas en Botswana, y evaluar el manejo sindrómico y otras estrategias de tratamiento para esas enfermedades en el embarazo.

Métodos Se realizó un estudio transversal en el que se entrevistó y examinó a 703 mujeres que recibieron atención prenatal. Se obtuvieron muestras para detectar los casos de infección por TV, VB, *Candida*, *Chlamydia trachomatis* y *Neisseria gonorrhoeae*. La realización de una entrevista estructurada y el examen de los registros prenatales permitieron reunir información sobre las infecciones del aparato reproductor sufridas en fases anteriores del embarazo.

Resultados Se detectó TV en el 19% de las mujeres examinadas, y VB en el 38%. Tres cuartas partes de las mujeres con TV o VB no presentaban síntomas. El manejo sindrómico basado en el algoritmo del flujo vaginal llevaría a subdiagnosticar y sobretratar considerablemente la infección por TV y la VB. A la hora de

determinar la presencia de esas enfermedades, los signos de flujo vaginal tenían un mayor valor predictivo que los síntomas. Entre las 546 mujeres que ya habían realizado antes una visita prenatal, a 142 (26%) se les había diagnosticado flujo vaginal en fases anteriores del embarazo (a 14 de ellas dos veces). En 143 casos se diagnosticó flujo vaginal en el segundo o tercer trimestre, pero sólo se había prescrito metronidazol en 17 ocasiones (12%).

Conclusión El diagnóstico y tratamiento de la infección por TV y la VB entre las embarazadas en el África subsahariana tropieza con importantes dificultades. A la mitad de las embarazadas participantes en este estudio se les diagnosticó TV o VB, pero esas afecciones no fueron detectadas y tratadas en visitas de atención prenatal en que se aplicaba el manejo sindrómico. Además, los trabajadores sanitarios no seguían las directrices terapéuticas. Estos resultados indican que es necesario revisar las directrices de tratamiento de la infección por TV y la VB en la atención prenatal.

ملخص

عدم كفاية الأسلوب المتلازمي في معالجة داء المشعرات والتهايب المهبل الجرثومي لدى الحوامل

أيضاً أن النجيج المهبلي أكثر دلالة على وجود هذه الحالات، بالمقارنة مع الأعراض. ومن بين 546 من المترددات بشكل متكرر على عيادات الرعاية السابقة للولادة، تم تشخيص 142 منهن (أي نسبة 26%) بوجود نجيج مهبلي في فترة مبكرة من الحمل، مع تعرّض 14 امرأة منهن لهذا النجيج مرتين. وتم تشخيص 143 حالة من المترددات على العيادات بأنهن مصابات بنجيج مهبلي في الأثلوث الثاني أو الثالث من الحمل. ومع ذلك لم يوصف المترونيديازول إلا 17 مرة فقط (أي بنسبة 12%).

الاستنتاج: يمثل تشخيص ومعالجة المشعرة المهبليّة والتهايب المهبل الجرثومي تحدياً كبيراً أمام الحوامل في البلدان الواقعة جنوب الصحراء الأفريقية. وقد تم في هذه الدراسة تشخيص العدوى المشعرة المهبليّة والتهايب المهبل الجرثومي لدى نصف الحوامل، ومع ذلك لم يتم اكتشاف أو معالجة هذه الحالات بالأسلوب المتلازمي في الفترة السابقة للولادة. وخلصت الدراسة أيضاً إلى أن العاملين الصحيين لم يلتزموا بالدلائل الإرشادية للمعالجة. وتشير هذه النتائج إلى أن الدلائل الإرشادية لمعالجة هذه الحالات في الفترة السابقة للولادة ينبغي مراجعتها وتنقيحها.

الغرض: استهدفت هذه الدراسة قياس مدى انتشار العدوى بالمشعرة المهبليّة وبالتهايب المهبل الجرثومي لدى الحوامل في بتسوانا، وتقييم الأسلوب المتلازمي والاستراتيجيات البديلة المتبعة لمعالجة هذه الحالات في فترة الحمل.

الطريقة: في هذه الدراسة المستعرضة، تمت مقابلة وفحص 703 من المترددات على عيادات الرعاية السابقة للولادة، وأخذت منهن عينات لتحري العدوى بالمشعرة المهبليّة، والتهايب المهبل الجرثومي، وأنواع المبيضات البيض، والمتدثرة الحثرية، والنيسرية البنية. وتم الحصول على معلومات عن عدوى السبيل الإنجابي في فترة مبكرة من الحمل، وذلك من خلال مقابلات منظمة مع الحوامل، ومن خلال سجلات عيادات الرعاية السابقة للولادة.

الموجودات: لوحظ وجود عدوى بالمشعرة المهبليّة لدى 19% من الحوامل المترددات على العيادات، كم لوحظ التهايب المهبل الجرثومي لدى 38% منهن. وكان ثلاثة أرباع الحوامل المصابات بالمشعرة المهبليّة والتهايب المهبل الجرثومي لا يشتكين من أعراض. وتبين أن معالجة المتلازمات وفقاً للوغاريتمات قياس النجيج المهبلي، قد تؤدي إلى قصور شديد في التشخيص، وإلى الإفراط في معالجة المشعرة المهبليّة والتهايب المهبل الجرثومي. وتبين

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Table 2. Association between symptoms and signs and laboratory-verified trichomoniasis or bacterial vaginosis among 703 antenatal care attendees in Gaborone, Botswana

	Trichomoniasis		N	Odds ratio (95% confidence interval)	P-value
	% Positive (n = 132)	% Negative (n = 571)			
Symptoms					
More discharge than usual					
No	77	84	584	1	
Yes	23	16	119	1.59 (1.00–2.54)	0.049
Itching or soreness					
No	91	92	645	1	
Yes	9	8	58	1.14 (0.59–2.22)	0.70
Lower abdominal pain					
No	96	92	650	1	
Yes	5	8	53	0.53 (0.22–1.27)	0.15
Clinical signs					
Moderate/profuse discharge					
No	46	68	447	1	
Yes	55	32	256	2.52 (1.72–3.71)	0.000
Runny discharge					
No	62	93	615	1	
Yes	38	7	88	8.55 (5.23–13.84)	0.000
Malodorous discharge					
No	84	96	659	1	
Yes	16	4	44	4.51 (2.41–8.43)	0.000
Frothy discharge					
No	56	90	590	1	
Yes	44	10	113	7.35 (4.73–11.44)	0.000
Specific discharge characteristics					
Negative	46	86	552	1	
Runny/malodorous/frothy	54	14	151	7.14 (4.71–10.83)	0.000
Vaginal discharge					
Negative	36	61	395	1	
<i>Candida</i> -like discharge	3	14	81	0.38 (0.13–1.07)	0.068
Other vaginal discharge	61	26	227	3.93 (2.62–5.91)	0.000
Bacterial vaginosis					
	% Positive (n = 268)	% Negative (n = 435)			
Symptoms					
More discharge than usual					
No	82	84	584	1	
Yes	18	16	119	1.12 (.075–1.67)	0.585
Itching or soreness					
No	91	92	645	1	
Yes	9	8	58	1.25 (0.73–2.16)	0.415
Lower abdominal pain					
No	92	93	650	1	
Yes	8	7	53	1.17 (0.66–2.06)	0.598
Clinical signs					
Moderate/profuse discharge					
No	62	65	447	1	
Yes	38	35	256	1.15 (0.84–1.58)	0.383
Runny discharge					
No	82	91	615	1	
Yes	18	9	88	2.16 (1.37–3.38)	0.001

(Table 2, cont.)

	Bacterial vaginosis		N	Odds ratio (95 % confidence interval)	P-value
	% Positive (n = 268)	% Negative (n = 435)			
Malodorous discharge					
No	88	97	659	1	
Yes	12	3	44	4.25 (2.18–8.27)	0.000
Frothy discharge					
No	74	90	590	1	
Yes	26	10	113	3.08 (2.04–4.67)	0.000
Specific discharge characteristics					
Negative	66	86	552	1	
Runny/malodorous/frothy	34	14	151	3.33 (2.30–4.84)	0.000
Vaginal discharge					
Negative	50	59	395	1	
<i>Candida</i> -like discharge	4	16	81	0.27 (0.14–0.54)	0.000
Other vaginal discharge	46	24	227	2.28 (1.63–3.18)	0.000