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## Document heading

## Adjuncts to case assessment of vaginal discharge syndrome in pregnant women

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## ABSTRACT

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**Objective:** To investigate the aetiology of abnormal vaginal discharge, using a non-culture based method, among pregnant women presenting at the University of Calabar Teaching Hospital, Calabar, Nigeria. **Methods:** Two hundred consecutive antenatal patients, aged 18 to 38 years, with complaints of abnormal vaginal discharge between 1st April and 31st July 2004 were investigated clinically for the characteristics of the vaginal discharge. High vaginal swabs taken from the vaginal fornices were examined using a non-culture based method to determine the possible aetiology of the discharge. The possibility of integrating non-culture based laboratory methods in the syndromic case management of abnormal vaginal discharge in an antenatal clinic setting is discussed. **Results:** The commonest form of abnormal discharge was curdy white in 66% of cases. Ten (5%) women had malodourous vaginal discharge, 92% had vulval itching; and superficial dyspareunia was seen in 29% of cases. Microscopic studies of vaginal discharge revealed the following findings: lactobacilli (96%), polymorphs (96%), 'clue' cells (4%); positive Whiff test (5%), and pH > 4.5 (7%). The clinical and laboratory assessment of each patient lasted between 35 and 45 minutes. The procedures used were acceptable to 78% of women. **Conclusion:** The use of non-culture based laboratory methods in the initial assessment of abnormal vaginal discharge can be a useful adjunct in the syndromic case management of abnormal vaginal discharge in pregnant women.

## 1. Introduction

Sub-Saharan Africa has the highest prevalence of sexually transmitted infections worldwide. These sexually transmitted infections (STIs) have a major impact on health, particularly in women and neonates [1]. It should be part of the antenatal care programmes to diagnose and treat STIs due to their association with maternal, fetal and infant morbidity. STIs can cause serious complications, such as ascending infections, infertility, cervical cancer, spontaneous abortion, premature delivery and low birth weight [2]. Epidemiological and biological studies have shown that ulcerative and non-ulcerative STIs can enhance HIV transmission [3,4]. In developing countries, diagnosis of STIs is limited to the syndromic approach, using the 'vaginal discharge syndrome' (VDS) algorithm. In the early 1990s, the World Health Organization developed syndromic management guidelines as a case management of symptomatic STI patients in countries without laboratory

support. Vaginal discharge is poorly predictive of STIs, and in order to reduce over-treatment, the WHO recommends the incorporation of risk assessments in the syndromic management of STIs [5]. Risk factors associated with infection is specific to the population groups from which they are observed, and a validation of the algorithm in the antenatal care is lacking [5,6]. In addition to the syndromic management of women with symptoms, all antenatal care attendees should ideally be clinically screened for reproductive tract infections (RTIs). Antenatal care guidelines should include a routine speculum examination at the first antenatal visit, to exclude STIs, and abnormalities of the pelvis [7]. It is not unusual to find abnormal vaginal discharge in women without symptoms. Asymptomatic pregnant women with abnormal vaginal discharge need syndromic treatment also. A disadvantage of the WHO syndromic algorithms is that do not cater for asymptomatic cases. However, asymptomatic women could not be assessed in this study because of logistic constraints. It is hoped that this study can make a case for clinical and non-culture based laboratory methods in the initial assessment of abnormal vaginal discharge in pregnancy. There is a need for integration of STI prevention and treatment in the antenatal care setting.

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## 2. Materials and methods

Two hundred consecutive antenatal care patients, aged 18 to 38 years, with complaints of abnormal vaginal discharge between 1st April and 31st July 2004 were investigated for the possible aetiology, in the antenatal clinic setting, of the University of Calabar Teaching Hospital. The history of the characteristics of the discharge was obtained and a speculum examination of the vagina done. The nature of the vaginal discharge was determined by inspecting the vaginal introitus and walls. High vaginal swab specimens taken from the vaginal fornices were examined for pH; and a drop of 10% potassium hydroxide (KOH) was added to a wet smear of vaginal secretion on a slide. It was mixed and sniffed for the production of fishy amine – like odour (Whiff test). Saline wet preparation of the specimen was examined microscopically for yeast cells, trichomonads and 'clue' cells. Gram-stain of a fixed and dried smear was examined microscopically for white blood cells (WBC) and lactobacilli. Patients with cervicitis and those who declined consent were excluded from this study. The laboratory assessment took averagely 35 to 45 minutes to complete. The results obtained were analyzed using simple proportion and displayed in a tabular form.

## 3. Results

Major concerns in women who found the procedures objectionable included: increased waiting time (9%), varying degrees of discomfort (8%), and anxiety about outcome of tests (5%). The commonest form of abnormal discharge was curdy white in 66%(132/200) of cases. Sixty women (60/200, 30%) had green yellow discharge while 8 women (8/200, 4%) had homogeneous grayish–white vaginal discharge. Ten women (10/200, 5%) had malodorous discharged; 92% (184/200) had vulval itching; and superficial dyspareunia was seen in 29% (58/200). Microscopic studies of vaginal discharge (Table 1) revealed the following findings: lactobacilli (96%); polymorphs (96%); pH>4.5 (7%); positive Whiff test (5%); and 'clue' cells (4%).

**Table 1**  
Non – culture tests of abnormal discharge.

Laboratory tests		%
Saline wet mount	Clue cells	4(8/200)
	Motile protozoa	30(60/200)
KOH test	Whiff test positive	5(10/200)
	Pseudohyphae	66(132/200)
Gram-stain (dominant)	Lactobacilli/	96(192/200)
	Polymorphs	
pH	> 4.5	7(14/200)

## 4. Discussion

In many developing countries, where prevalence of STI is high and the facilities for aetiological diagnosis of STI are largely limited, the World Health Organization has recommended syndromic case management as an appropriate strategy for the prevention and control of STDs [8]. Syndromic case management is based on identification of combination of signs and symptoms, knowledge of common causative organisms of those symptoms and their antibiotic sensitivity. It is cost-effective, does not require a specialist

as well as laboratory facilities, and is suitable for any level of health system, including primary health care. However, it can result in a certain proportion of female patients with vaginal discharge being over treated since the symptoms of cervical infection are not specific. This is especially true in low prevalence settings, such as in primary health centers where few STIs are seen. The syndromic approach also ignores asymptomatic cases, which are most common in women and make up over half of all STDs. Additionally, it can result in the overuse of some drugs that may be expensive and difficult to obtain.

There are many levels of STI management. The setting of this study is a tertiary hospital, where facilities are available for speculum examination of the vagina. Syndromic management can lead to wrong diagnosis and treatment. That was the rationale for combining syndromic with clinical management and limited laboratory tests. This allows for a one visit assessment and obviates the need for return visits associated with aetiological management of STI. The symptoms of cervicitis and vaginitis overlap. Abnormal vaginal discharge (in amount, color or odour) is the symptom most commonly presented, but it is more predictive for vaginitis than for cervicitis. The most probable cause of a woman complaining of vaginal discharge is vaginitis [9,10]. Cervicitis is a less frequent cause of consultation for vaginal discharge, but the complications of untreated cervicitis are much more serious. Patients with cervicitis were excluded from this study.

This study revealed that the commonest form of abnormal vaginal discharge was curdy white. This was suggestive of vaginal candidiasis, a common complaint in pregnant women. *Candida albicans* is the most common *Candida* species causing symptomatic candidiasis. Clinical infection may be associated with a systemic disorder (diabetes mellitus, HIV, obesity), pregnancy, medication (antibiotics, corticosteroids, oral contraceptives), and chronic debilitation [11]. Vulvovaginal candidiasis presents with intense vulval pruritus; a white curdlike, cheesy vaginal discharge; and vulval/ vaginal erythema, as seen in this study. Diagnosis was based on demonstration of candidal mycelia and a normal vaginal pH of 4.5. Identification of *C. albicans* requires finding filamentous forms (pseudohyphae) of the organism when vaginal secretions are mixed with 10% KOH solution.

Greenish yellowish discharge was observed in 30% of cases. This was suggestive of *Trichomonas vaginalis* infection. *Trichomonas vaginalis* is a unicellular flagellate protozoan, which infects the lower urinary tract in both women and men [11]. A persistent vaginal discharge was the principal symptom with varying degrees of secondary vulval pruritus, in cases seen. The discharge is usually profuse, frothy, greenish, and at times foul-smelling. The pH of the vagina usually exceeds 5.0. This was not a consistent finding, as only 7% of the study population had a pH above 4.5 [11]. Involvement of the vulva was mainly limited to the vestibule and labia minora. Wet mount with normal saline revealed an increase in polymorphonuclear cells and characteristic motile flagellates in affected cases.

Bacterial vaginosis (BV), formerly known as nonspecific vaginitis was so named because bacteria are the aetiological agent but an associated inflammatory response is lacking [12]. Clinical diagnosis of BV relies on history, vaginal examination, and microscopic examination of vaginal fluid specimens. Clinical information obtained from the

patients showed that 8 (4%) women had vaginal discharge characteristic of BV i.e. gray, thin, and homogeneous discharge, adherent to the vaginal mucosa. This discharge was not associated with itching/erythema and dyspareunia, as observed in this study. Vaginal odour is the most common, and often initial, symptom of BV<sup>[12,13]</sup>. This was the case in all the women, who presented with homogenous vaginal discharge. Odour was recognized after sexual intercourse, in these women. The alkalinity of semen may cause a release of volatile amines from the vaginal discharge and a fishy odour<sup>[14]</sup>. An amine odour can also occur in women with trichomoniasis, but not in women with normal vaginal discharge or candidiasis<sup>[13]</sup>. This was the case in two (1%) women with trichomoniasis. Inspection of the lower genital tract in women that fulfilled the criteria for BV showed normal labia, introitus, and cervix, with no evidence of vulval irritation/erythema.

Microscopic examination of the vaginal discharge is necessary for accurate diagnosis of BV<sup>[13]</sup>. Demonstrating three of the following four criteria is used to establish a diagnosis: 1. presence of 'clue' cells, 2. pH  $\leq$  4.5, 3. characteristic vaginal discharge and 4. positive Whiff test<sup>[12, 13]</sup>. Eight women (4%) in this study fulfilled at least three out of the four criteria needed to make a diagnosis of BV. Demonstrating 'clue' cells on saline mount is the most specific criterion for the clinical diagnosis of BV<sup>[15]</sup>. 'Clue' cells are vaginal epithelial cells that have bacteria (cocci/bacilli) adherent to their surfaces. A normal pH > 4.5 is a good negative predictor of BV, as a normal pH is found in less than 3% of women with BV<sup>[16]</sup>. During this study, an abnormal pH > 4.5 was demonstrated in 7% of all cases. The Whiff test may be positive in up to 70% of BV patients<sup>[17]</sup>. A positive Whiff test was observed in ten women (5%) during the study.

A gram-stained smear of vaginal discharge was examined for evidence of changes in the overall bacterial predominance. The healthy vagina has a predominance of lactobacilli (large gram-positive rods)<sup>[17]</sup>. The flora of a patient with BV changes to become dominated by cocci/bacilli<sup>[18]</sup>. This was demonstrated in the patients that fulfilled the criteria for diagnosis of BV in this study. Also there was a relative lack of polymorphonuclear leukocytes on Gram-stain examination of vaginal discharge obtained from women with BV in this study. This has been reported to be due to a notable lack of inflammatory response in women with BV<sup>[12]</sup>.

The clinical and laboratory assessment of patients usually took less than an hour. This was well tolerated by patients with proper diagnosis of their complaint made. The laboratory assessments of specimens were done in a side room in the antenatal clinic complex. Patients did not have to be attended to in the regular laboratory building, which was quite far away. Integration of services is the offering of two or more services at the same facility during the same operating hours, with the provider of one service actively encouraging women to consider using the other services during the same visit<sup>[19]</sup>. This arrangement of service integration allows for improved access to STI prevention and treatment. It should be encouraged.

The study has shown the feasibility of combining syndromic, clinical and limited laboratory tests in the initial assessment of abnormal vaginal discharge in an antenatal clinic setting. Integrating the diagnosis of abnormal vaginal discharge with antenatal care services provided a one

visit assessment of vaginal discharge syndrome and was acceptable to pregnant women in this study. This has the potential of improving access to clinical and laboratory diagnosis of the vaginal discharge syndrome in women presenting for antenatal care.

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