

Syndromic versus laboratory-based diagnosis for lower genital tract infections among married women in selected sub-urban communities, Yangon

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The syndromic diagnosis is the most realistic and cost-effective strategy for controlling sexually transmitted infections (STI) in the developing countries. This approach relies on symptom recognition by an infected person who as a consequence seeks medical care. A cross-sectional study was carried out in January and April 2007 at Indaing and Hmawbi areas to determine the prevalence of certain reproductive tract infections (gonorrhoea, trichomoniasis, candidiasis and bacterial vaginosis) and to evaluate the accuracy of the syndromic diagnosis by comparing with laboratory diagnosis. Of 212 symptomatic and asymptomatic married women (93 from Indaing and 119 from Hmawbi), the prevalence of gonorrhoea was 3.8%, trichomoniasis 17.5%, candidiasis 15.6 % and of bacterial vaginosis 13.2%. Syndromic diagnosis for lower genital tract infections (LGTI) was made on the basis of presence of clinical symptom of vaginal discharge and signs such as creamy white or greenish-yellow vaginal discharge and/or vaginitis and/or cervicitis on speculum examination. Among 80 laboratory-confirmed LGTI (trichomoniasis, candidiasis and bacterial vaginosis), syndromic diagnosis can detect 47.5% (38/80) of these infections. There is unsatisfactory agreement between laboratory diagnosis and syndromic diagnosis (Kappa coefficient= 0.04). The present study found out the occurrence of asymptomatic reproductive tract infection in the community and clinical judgement based on symptoms and signs seemed to be less indicative for LGTI. The lack of association between symptoms and laboratory-confirmed infections underscores the challenge of diagnosing LGTI when laboratory testing is not available.

INTRODUCTION

Reproductive tract infections (RTIs) continue to cause significant morbidity and mortality throughout the world. Chlamydia, gonorrhoea, candidiasis, trichomoniasis and bacterial vaginosis are the common curable RTIs and they are mainly transmitted by sexually. The World Health Organization (WHO) estimates that 340 million new cases of curable RTIs occurred throughout the world in 1999 in men and women aged 15-49 years [1].

The RTIs are important health priority not only because of their complication but also because of their association with Human

Immunodeficiency Virus (HIV) and AIDS. The presence of RTIs has been found to facilitate the acquisition and transmission of HIV infection. Therefore prevention and control of RTIs have gained greater importance with the emergence of HIV/AIDS.

In Myanmar, RTI is one of the priority health problems among 39 priority diseases in the National Health Plan from 2006-2011. A recent study carried out on 426 symptomatic women attending various clinics in Mandalay, showed high prevalence of bacterial vaginosis (40.1%) in 299 symptomatic women attending general clinics, with candidiasis (23.7%) being the second most common RTI. In this study, chlamydia,

gonorrhoea, syphilis and trichomoniasis were 4, 2.7, 2.0 and 2.7% respectively in general clinics and 14.2, 14.4, 13.4 and 3.1% respectively in sexually transmitted diseases (STD) clinics [2]. The other study on 90 symptomatic women at the Central Women's Hospital, Yangon, found a prevalence of 27.5% for bacterial vaginosis, 18% for chlamydiosis, 2.2% for gonorrhoea and 3.3% for trichomoniasis [3].

There are limited prevalence data available from community-based studies concerning RTIs in Myanmar. The recent community-based study on RTIs among currently married women in Yangon reported the prevalence of 1.11% (chlamydiosis), 2.23% (candidiasis), 7.06% (trichomoniasis) and 0.74% (gonorrhoea) in urban area and 1.89% (chlamydiosis), 1.68% (candidiasis), 7.55% (trichomoniasis) and 2.1% (gonorrhoea) in semi-urban area [4]. The most realistic and cost-effective strategy for control of RTIs in developing countries is syndromic management approach as recommended by the World Health Organization (WHO). The syndromic approach has the potential advantage of giving immediate treatment at the first contact with health care system without waiting for laboratory results [5]. However, the algorithms proposed by WHO should be periodically evaluated under field conditions. Failure to diagnose and treat the curable RTIs can have serious complications such as infertility, pelvic inflammatory diseases, miscarriage, prematurity and neonatal infections in men, women and newborns. [6].

This study was focussed upon gonococcal, trichomonas, candida and bacterial vaginosis infections which usually cause vaginal discharge as a symptom in infected women. However, these infections can either have no symptoms or symptoms as mild as to pass unnoticed. Thus, our study was carried out to reveal the magnitude of RTIs among married women in semi-urban area as they are an important group for transmission of RTIs. Then we evaluated the accuracy of a WHO syndromic algo-

rithm for women with symptoms and signs of vaginal discharge to diagnose lower genital tract infections (trichomoniasis, candidiasis and bacterial vaginosis) in comparison with laboratory test results.

Objectives

- To detect gonococcal, and trichomonas, candidiasis and bacterial vaginosis infections among married women in semi-urban area (Indaing and Hmawbi military communities)
- To evaluate the accuracy of the syndromic diagnosis for women with vaginal discharge by comparing with laboratory diagnosis

MATERIALS AND METHODS

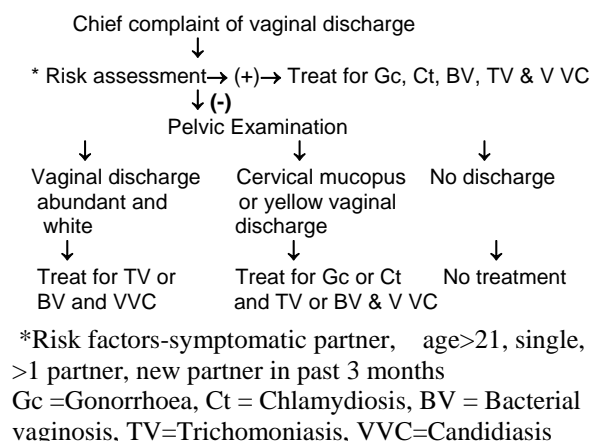
A cross-sectional community-based study was carried out among currently married women in Indaing, 50 Km from Yangon, and Hmawbi, 40 Km from Yangon in January and April 2007. The study population comprised 93 women from Indaing and 119 women from Hmawbi.

The participants were invited to come to a health centre/clinic at the study area. The informed consent was obtained before the enrolment. The clinicians recorded data on socio-demographic characteristics, contraceptive usage, obstetric, gynaecological history and STD history and presence of a complaint of vaginal discharge. Participants were categorized as symptomatic when she was presenting with vaginal discharge at the current visit or one month before this visit. All participants were undergone a standardized pelvic examination (including speculum and bimanual examination) with special attention given to inflammation of vulva, vagina and cervix; the characteristics of the cervical and vaginal discharge; and abnormal cervical, uterine and adnexal tenderness. The endocervical swab and high vaginal swab specimens were collected to perform laboratory procedure.

The clinicians diagnosed the lower genital tract infections (LGTI) including tricho-

moniasis, candidiasis and bacterial vaginosis according to a WHO syndromic algorithm for diagnosis of women with vaginal discharge (shown below). Syndromic diagnosis was made on the basis of presence of clinical symptom of vaginal discharge and signs such as creamy white or greenish-yellow vaginal discharge and/or vaginitis and/or cervicitis on speculum examination. Participants who were diagnosed as having LGTI were treated with metronidazole 200 milligram for three times a day for 7 days and intravaginal cotrimazole tablet 500 mg single dose at the health centre/clinic at the study area. If the laboratory results revealed an infection which had not been treated, the study team informed the laboratory results to the medical officer in charge of the respective areas to give the treatment to the participant.

A WHO Algorithm for clinical presentation with vaginal discharge



Specimen collection for laboratory procedures

One endocervical swab was taken for detection of *N. gonorrhoeae*. This swab was inoculated onto Amies Transport medium. Two high vaginal swabs were taken for detection of bacterial vaginosis, candidiasis and trichomonas infections. One swab was put into an eppendorf tube containing 0.9% normal saline and the other swab was inoculated onto Diamond's trichomonas medium. The specimens were kept in an ice box and carried to Bacteriology Research Division, DMR (LM). Laboratory procedures

were carried out according to the method described by Van Dyck *et al.*, 1999 in WHO manual [7].

Detection of Trichomonas vaginalis

Both microscopy and culture method were used to detect trichomoniasis. Wet mount microscopic examination was carried out to detect motile *T. vaginalis*. The trichomonas medium was incubated at 35° C up to 7 days and positive growth was checked by microscopy on wet films and Giemsa stained smears.

Detection of Neisseria gonorrhoeae by culture

An endocervical swab in Amies Transport media was inoculated onto Modified Thayer Martin agar and chocolate agar and incubated at 35°C up to three days in the moist candle jar. Positive cultures from chocolate and Thayer Martin agar were identified by colony morphology, Gram staining, positive oxidase reaction, and the phabedact agglutination.

Detection of candidiasis

By KOH wet preparation and culture on Sabouraud's agar.

Detection of bacterial vaginosis (BV)

By testing of vaginal pH (ranged 4.0-7.0), Gram-stained smear and wet mount examination for clue cells. Women were defined as having a specific RTI if any of the laboratory tests for *T. vaginalis*, *N. gonorrhoeae*, *C. albicans* and bacterial vaginosis were positive.

Data analysis & ethical consideration

Only women in whom all laboratory results were available were considered in the analysis. The data were checked and analysed by using SPSS for Windows software version 12.0. This study was approved by the ethical committee, Defence Services Medical Academy.

RESULTS

Socio-demographic data

The demographic data and relevant history of 212 married women (93 from Indaing,

and 119 from Hmawbi) are shown in Table 1. Ninety-eight (46.2%) women had symptoms of vaginal discharge at the current visit and 114 (53.8%) were asymptomatic.

Table 1. The demographic data and relevant history of 212 married women

Demographic data	Number	Percentage
Age		
19-56 years		
Mean 35.7 SD \pm 7.68		
Occupation		
Dependent	184	86.80
Own business	20	9.40
Sedentary	8	3.80
Education		
Primary school	91	42.90
Middle school	51	24.10
High school	63	29.70
University	7	3.30
Parity		
Parity 0 to 1	41	19.30
Parity 2 to 4	146	68.90
Parity 5 to 7	25	11.80
No. of marriage		
Single marriage	207	97.60
Married for >1 time	5	2.40
Presenting symptoms		
Vaginal discharge	98	46.20
Characteristics of vaginal discharge		
Creamy colour	39	18.40
Greenish yellow color	18	8.50
Associated with pruritus	37	17.50
Associated with offensive odour	31	14.60
Profuse amount	27	12.70
Moderate amount	39	18.40
Scanty amount	32	15.10
Type of current contraceptive usage		
Oral contraceptive pills	97	45.80
Contraceptive injection	91	42.90
Barrier method	5	2.40
Intra uterine device	21	9.90
Condom	14	6.70
History		
Past history of abortion present	53	25.00
Previous STD history present	2	0.90

Prevalence of RTIs

Table 2 represents the prevalence of RTIs in the study population. Of 212 married women, 83 (39.2%) had at least one of the tested infections. Double infections (*N. gonorrhoeae* + *T. vaginalis* or *C. albicans*/ *T. vaginalis* + *C. albicans* or bacterial vaginosis/ *C. albicans* + bacterial vaginosis) were found in 16 (7.5%) and triple infections (*N. gonorrhoeae* + *T. vaginalis* + *C. albicans* or *T. vaginalis* + *C. albicans* + bacterial vaginosis) were found in 3 (1.4%) of the study population.

Table 2. Prevalence of RTIs among 212 married women (93 from Indaing and 119 from Hmawbi)

Infection	Area	No.	Total No. (%)
<i>N. gonorrhoeae</i>	Indaing	7	8
	Hmawbi	1	(3.8 %)
<i>T. vaginalis</i>	Indaing	24	37
	Hmawbi	13	(17.5 %)
<i>C. albicans</i>	Indaing	23	33
	Hmawbi	10	(15.6 %)
Bacterial vaginosis	Indaing	18	28
	Hmawbi	10	(13.2%)
Double infections	Indaing	15	16
	Hmawbi	1	(7.5 %)
Triple infections	Indaing	2	3
	Hmawbi	1	(1.4 %)
Overall infections	Indaing	53	83
	Hmawbi	30	(39.2%)

RTIs among symptomatic and asymptomatic women

The proportion of gonorrhoea, trichomoniasis, candidiasis and bacterial vaginosis is shown among women with presence of symptoms of vaginal discharge at current visit and those without the symptoms. Higher proportion (44.7%) of overall RTIs was found among the asymptomatic women (Table 3).

Table 3. Percentage of RTIs among symptomatic and asymptomatic married women

Infections	Symptomatic (n=98)	Asymptomatic (n=114)
<i>N. gonorrhoeae</i>	4 (4.1%)	4 (3.5%)
<i>T. vaginalis</i>	15 (15.3%)	22 (19.3%)
<i>C. albicans</i>	13 (13.3%)	20 (17.5%)
Bacterial vaginosis	9 (9.2%)	19 (9.0%)
Overall infections	32 (32.7%)	51 (44.7%)

Comparison of syndromic diagnosis and laboratory-based diagnosis for lower genital tract infections (trichomoniasis, candidiasis and bacterial vaginosis)

Syndromic diagnosis for lower genital tract infections (LGTI) was made on the basis of presence of clinical symptom of vaginal discharge and signs such as creamy white or greenish-yellow vaginal discharge and/ or vaginitis and/or cervicitis on speculum examination. Ninety-five women were diagnosed to have LGTI. Among 80 laboratory-confirmed LGTI (trichomoniasis, candi-

diasis and bacterial vaginosis), syndromic diagnosis can detect 47.5% (38/80) of these infections (Table 4).

Table 4. Lower genital tract infections (trichomoniasis, candidiasis and bacterial vaginosis) diagnosed by syndromic diagnosis and laboratory-based diagnosis

Syndromically diagnosed LGTI	Laboratory diagnosed LGTI		Total
	Present no.	Absent no.	
Present no.	38	57	95
Absent no.	42	75	117
Total	80	132	212

Kappa coefficient= 0.04,
Unsatisfactory agreement between laboratory and syndromic diagnosis

DISCUSSION

The present study provides prevalence data of four important reproductive tract infections in married women in sub-urban community in Myanmar. These include the prevalence of gonorrhoea 3.8%, trichomoniasis 17.5%, candidiasis 15.6% and of bacterial vaginosis 13.2%. The prevalence detected in our study was lower than that of a recent study on symptomatic women attending various clinics in Mandalay, which showed high prevalence of bacterial vaginosis (40.1%) candidiasis (23.7%) and gonorrhoea (14.4%) [2]. However the prevalence of all tested RTIs in our setting is higher than a recent community-based study on RTIs among married women in semi-urban area in Yangon during 2002 which reported the prevalence of 1.68% (candidiasis), 7.55% (trichomoniasis) and 2.1% (gonorrhoea) [4]. It showed that occurrence of asymptomatic infections in our study population accounts for higher rate of infection than Nyein *et al.*'s study.

The mean age of the participants was 35.7 years and 79.3% were in the age group of 25-45 years. Sixty-seven (80.7%) of tested RTIs were found in this reproductive age group which is an important group for transmission of STIs. Some 86.8% of women were dependants and 67% had primary and middle school education. High rate of 98.7% used oral and injection form contraceptives

and low rate of 6.7% used condoms. Condom used within marriage was found to be only 2.4%. These findings could provide the necessary information to the National AIDS/STD Control Programme for implementation of the prevention, control and health education programs targeted on married women and urgent need for condom promotion in sub-urban area.

Overall prevalence of tested RTIs in Indaing area (53/93, 56.9%) was higher than that of Hmawbi area (30/119, 25.2%), however, socio-demographic background characteristics and hygienic factors such as source of water supply and sanitary habit data collected in our study of two areas were not much different, so that the association of higher prevalence with these factors can not be documented. However, spouses of married women from Indaing area are highly mobile. Mobility is the strong risk factor for RTIs.

Higher proportion (44.7%) of overall RTI was found among the asymptomatic women and only 32.7% were detected among symptomatic women in the study population. The syndromic approach relies on symptom recognition by an infected person who as a consequence seeks medical care. Reliance to reported symptoms may miss asymptomatic infections. Individuals may also fail to recognize symptoms as manifestation of disease. To achieve STD control in this and similar population, the present findings support the fact that public health programmes should target asymptomatic infections. Presence of double infection (7.5%) and triple infection (1.4%) among the study population also highlighted the importance of case finding and treatment of RTIs in the community.

Syndromic diagnosis for lower genital tract infections (LGTI) was made on the basis of presence of clinical symptom of vaginal discharge and signs such as creamy white or greenish-yellow vaginal discharge and/or vaginitis and/or cervicitis on speculum examination. There is unsatisfactory agreement between syndromic diagnosis and

laboratory diagnosis (Kappa coefficient =0.04). Among 80 laboratory-confirmed trichomoniasis, candidiasis and bacterial vaginosis, syndromic diagnosis can detect 47.5% (38/80) of these infections. Similar findings were seen in a study on RTIs in Mandalay clinics by DOH & Population Council, Thailand, 2002 [2].

Thus, clinical judgement based on symptoms and signs seemed to be less indicative for LGTI. Lack of association between syndromic diagnosed cases and laboratory-confirmed infections underscores the challenge of diagnosing LGTI when laboratory testing is not available. The present study recommended the need of large scale multicentre studies to evaluate the syndromic management for RTIs, to cultivate protective condom culture in high-risk communities and to encourage annual screening for RTIs in high-risk communities.

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