RESEARCH NOTE

PREVALENCE OF LOWER GENITAL TRACT INFECTIONS AMONG VIETNAMESE WOMEN ATTENDING A MATERNAL AND CHILD HEALTH CENTER IN HANOI, VIETNAM

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A recent census result in Vietnam suggested the country had a high fertility rate (Hull, 1990). Thus, any problem that may have impact on family planning is considered important by the Vietnamese government. The Institute for the Protection of Mother and the Newborn (IPMN) in Hanoi, which is the national research center for maternal and child health care, has expressed concerns about lower genital tract infections (LGTI) which may have an impact on the safety of intra-uterine device (IUD) widely use in the country because of their associations (Avonts *et al*, 1990). So far, no appropriate baseline information is available on LGTI in Vietnam. Therefore we carried out this pilot study to estimate the prevalence of some important LGTI organisms among women who attended the IPMN and to provide some baseline estimates for future epidemiologic studies on LGTI in Vietnam.

We carried out a cross-sectional prevalence survey (Kelsey *et al*, 1986) in Spring of 1994. Four hundred women, aged 18-50 years old, who attended the IPMN outpatient's gynecology clinic, were stratified into two groups of equal number depending upon whether they had a chief complaint of vaginal discharge (the so-called symptomatic group) or not (the asymptomatic group). Women who took antibiotics, or used vaginal antimicrobial agents or vaginal douches in the previous two weeks, plus those who were menstruating, pregnant, physically incapacitated, mentally deprived, or hysterectomized were excluded. Eligible women were then selected at random from each stratum and received an interview and pelvic examination after informed consent. The interviewer, gynecologist and laboratory personnel were blinded against patients' chief complaints. Endocervical swabs were used to identify *Neisseria gonorrhoea* using culture (WHO 1978; Baron and Finegold, 1990), and *Chlamydia trachomatis* antigen (Chlamydiazyme® Diagnostic Kit, Abbott Diagnostika, Delkenheim, Germany). Vaginal specimens were used to identify *Trichomonas vaginalis* using fresh examination (Collee *et al*, 1989) *Candida* spp using KOH-preparation and Gram stain (Amsel *et al*, 1983; Baron and Finegold, 1990), and *Gardnerella vaginalis* using composite clinical criteria (Amsel *et al*, 1983; Eschenbach *et al*, 1988).

The overall participation rate was high (90.8%). Those who participated were not different from those who did not with respect to age, marital status, age at first marriage, or chief complaint ($p > 0.1$ for any variable). All participating women were married with mean age (± SD) = 33.2 ± 7.3 years (range 19-50 years). Their mean age (± SD) at first marriage was 23.1 ± 4.1 years (range 15-42 years), and their mean age (± SD) at first sexual intercourse was 22.9 ± 4.0 years (range 16-42 years). Symptomatic patients had a higher participation rate when compared with those who were not symptomatic (94.5% versus 87.0%, $p = 0.02$). Symptomatic patients were about 2 years older when compared with the asymptomatic ones ($p < 0.01$, Table 1). Nevertheless, they were not different with

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respect to their age at first marriage, age at first sexual intercourse, or number of sexual partners ($p > 0.8$ for any variable, Table 1). Forty-eight women (16.2%) claimed to have genital ulcers at this visit but none were found on clinical examination. The symptomatic group reported a much higher proportion compared with the asymptomatic women [odds ratio (OR) = 28.4, exact 95% confidence interval (CI) = 7.1-244.7 (Mehta *et al*, 1985; Dean *et al*, 1994)]. We found, however, that their claims did not agree well with our clinical examination [κ-statistics < 0.2 (Fleiss 1981; Dean *et al*, 1994), $p < 0.01$]. Pelvic examinations showed that symptomatic patients had higher proportions of abnormal findings at the vulva, vagina or cervix than the asymptomatic patients (OR > 3, $p < 0.01$ for any organ). Of patients' abnormal discharges (237) 46.0% were curd-like, 38.4% mucus discharge, and 15.6% yellow or blood-stained. These clinical findings, however, were not significantly associated with any microbiologic laboratory results ($p > 0.07$).

Although we found no gonococcal infection in either group, statistical inference of its prevalence could be estimated using exact 95% CI (Fleiss, 1981; Dean *et al*, 1994), *ie* 0-1.9% in the symptomatic and 0-2.1% in the asymptomatic patients, respectively. *Candida* spp showed the highest prevalence in both groups. Except *T. vaginalis*, the prevalence of infections did not differ significantly between the two groups ($p > 0.8$ for any infection, Table 2). Symptomatic patients showed a much higher prevalence of *T. vaginalis* when compared with the asymptomatic group (OR = 10.7, exact 95% CI = 1.5-462.8).

Our findings of prevalence were relatively low when compared with others' (Bentsi *et al*, 1985; Riordan *et al*, 1990). It was of particular interest that none of the women was infected with *N. gonorrhoea*. This may possibly be because of true non-existence of the infection or the rather unique solitary society in north Vietnam during the study period. These data, however, must be cautiously interpreted because of the small sample size and the fact that IPMN is a referral center where patients' health-seeking behavior might differ from the population-based studies. Nevertheless, because of scarcity of available data, this study provides some useful baseline estimates for future epidemiologic studies in Vietnam.

ACKNOWLEDGEMENTS

We would like to thank the Special Program of Research, Development and Research Training in Human Reproduction of the World Health Organization (WHO/HRP) who funded this project (ID 92005), especially Dr Francis TG Webb and Dr Patrick J Rowe. We would like to thank the staff of the Institute for the Protection of Mother and the Newborn, Hanoi, Vietnam for various logistical support. We also thank the staff of Faculties of Public Health, Medicine (Siriraj Hospital), and Tropical Medicine, Mahidol University, Bangkok; and Bangrak Hospital, Ministry of Public Health, Bangkok, for their assistance in training of our project personnel. We also thank Ms Nuanphen Suk-aram for secretarial support.

Table 1

Comparisons of some characteristics between 189 symptomatic and 174 asymptomatic patients.

Variables	Symptomatic	Asymptomatic	p-value
Age (years)			
mean ± SD	34.2 ± 7.3	32.0 ± 7.1	< 0.01*
Age at first marriage (years)			
median (range)	22 (17-37)	22 (15-42)	0.96**
Age at first sexual intercourse (years)			
median (range)	22 (18-37)	22 (16-42)	0.89**
Number of sexual partners			
median (range)	1 (1, 2)	1 (1, 2)	0.91**

* Student's *t*-test

** Mann-Whitney test

Table 2

Comparisons of prevalence of infections between symptomatic and asymptomatic patients.

Organisms		Prevalence (%)	95% CI*	p-value
Candida spp				0.86
	symptomatic	22.2	16.6 - 29.0	
	asymptomatic	23.6	17.6 - 30.7	
Chlamydia trachomatis				0.89
	symptomatic	2.6	1.0 - 6.4	
	asymptomatic	3.4	1.4 - 7.7	
Gardnerella vaginalis				> 0.99
	symptomatic	2.6	1.0 - 6.4	
	asymptomatic	2.3	0.7 - 6.2	
Neisseria gonorrhoea				> 0.99
	symptomatic	0.0	0.0 - 1.9**	
	asymptomatic	0.0	0.0 - 2.1**	
Trichomonas vaginalis				0.01
	symptomatic	5.8	3.1 - 9.9**	
	asymptomatic	0.6	0.03 - 2.6**	

* 95% confidence interval-quadratic method (Fleiss 1981; Dean *et al*, 1994)

** Exact mid-p method (Rothman and Boice, 1979; Dean *et al*, 1994)

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