The Prevalence And Predictors Of Genital Tract Infections In Cervical Cytology Specimens At A University Teaching Hospital.

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Citation

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Abstract

Background: Genital tract infections such as Gardnerella vaginalis, vaginosis, trichomoniasis and candidiasis have continued to assume importance because of the particular unique features of their main causative organisms- Gardnerella vaginalis, Trichomonas vaginalis and Candida albicans, and myriads of clinical and pathological changes in affected persons
Aim: To investigate the prevalence of Gardnerella vaginalis, Candida albicans and Trichomonas vaginalis in randomly selected sexually active women and the influence of some socioeconomic factors on the prevalence of these genital infections.
Methods: The subjects were 450 randomly selected sexually active women attending antenatal, postnatal, gynaecology and family planning clinics in the Department of Obstetrics and Gynaecology of the University of Maiduguri Teaching Hospital from April 2001 to May 2002.The Pap smear of these patients were examined microscopically for evidence of Candida albicans, Gardnerella vaginalis and Trichomonas vaginalis. A questionnaire assessing sociodemographic characteristics of the patients were administered.
Results: Sixty six (66) of the 450 patients studied had specific infections giving a prevalence rate of 14.7%. Candida albicans, Garnerella vaginalis, Trichomonas vaginalis and Candida albicans in conjunction with Gardnerella vaginalis contributed 7.1%, 5.1%, 2.4% and 1.8% respectively to this overall prevalence. Age range of 15-20 years had the highest prevalence of each of the infections, but this association with age was not statistically significant (P> 0.05).The prevalence of each of the infections was highest among students and was lowest among housewives and business executives. These differences were statistically significant (P=0.034). The prevalence of these genital infections increased with increasing educational level, being lowest among those with no formal education and highest in patients with post-secondary educational qualifications. This difference was statistically significant (P= 0.034, c2 for linear trend= 0.90). About 36.5% of the married women tested had evidence of genital infections compared to 41.6% of the women who were not currently married; this difference was not statistically significant (P> 0.05).
Conclusion: This study has shown that cervical cytology is of definitive value in the diagnosis of some lower genital tract infections especially in low resource settings.

INTRODUCTION

Genital tract infections such as Gardnerella vaginalis, vaginosis, trichomoniaisis and candidiasis have continued to assume immense importance not only because of the particular unique features of their main causative organisms- Gardnerella vaginalis, Trichomonas vaginalis and Candida albicans, but also the fact that their main causative organisms can elicit myriads of clinical and pathological changes in different body tissues,organs and systems[1]. They have been implicated in neonatal meningitis, urinary tract infections, pyogenic liver abscess and following prostatetectomy [2 5]. Cervical cytology has not only served the purpose of screening for cervical intra-epithelial (CIN) lesions but has been useful in the diagnosis of genital tract infections such as Gardnerella vaginalis, Trichomonas vaginalis and Candida albicans [6]. The Papanicolaou smear for cervical cytology is cost effective, acceptable to most patients and adaptable to wide screenings[7]. In low resource settings with an organized or sporadic cervical cancer screening programmes where facilities might not easily be available to detect the above mentioned genital tract infections, cervical cytology has been found to be very

helpful[6]. It is also specific enough to detect cytological changes pathognomonic of human papilloma virus, which ordinarily is difficult to isolate under normal laboratory conditions, except by the use of special techniques like DNA hybridization, PCR amplification or viral culture[7-9].

There are a few previous reports on the prevalence of Candida albicans, Gardnerella vaginalis and Trichomonas vaginalis in cervical cytology specimens from some parts of Nigeria notably Ibadan [6] and Lagos [9] in he Southwestern part of the country; Maiduguri [10] in the North and from Enugu in the Southest[11,12]. This study investigates the prevalence of Gardnerella vaginalis, Candida albicans and Trichomonas vaginalis in randomly selected sexually active women attending various clinics in the Department of Obstetrics and Gynaecology of the University of Maiduguri Teaching Hospital and the influence of age, socioeconomic, educational and marital status on the prevalence of these genital infections.

MATERIALS AND METHODS

The subjects were 450 randomly selected sexually active women attending various clinics in the Department of Obstetrics and Gynaecology of the University of Maiduguri Teaching Hospital.

These included the antenatal, postnatal, Gynaecology and family planning clinics. They were recruited after consenting to participate and a formal approval had been given by the institution's ethics and research committee. The recruitment continued until a sample size of 450 was reached. This was calculated using the Epi Info version 6 programme for population or descriptive study using simple random sampling. It was based on a population of 4,342 patients/ clients attending the recruiting clinics from April 2001 to May 2002. The purpose, value and nature of the procedure was explained to each prospective patient and her consent obtained. All consenting patients had their pap smears taken using a moistened unlubricated Cusco's bivalve speculum and an Ayre's wooden spatula after a questionnaire containing the age, occupation, educational and marital status of the woman had been filled. The smears were immediately transported to the histopathology laboratory immersed in 95% ethanol for preparation, staining and reading. The smears were examined microscopically by a pathologist at the magnifications of 4, 10 and 100.

The WHO Epi Info statistical programme was used to compute and analyze the results. These included frequency distribution and tests of significance using the chi-square (). A P value of <0.05 was taken as being significant. The percentage of each infection was based on the total number of patients with each infection.

Inclusion criteria: All sexually active women attending the above clinics and who consented to participate in the programme were included until the sample size was reached.

Exclusion criteria: Women who declined to the consent were exempted, so were those who had never been sexually exposed. In addition, those with obvious cervical lesions, vaginal discharge and those who were menstruating were excluded from the study.

RESULTS

Table1 shows the cytology results of the Papanicolaou smears. Specific infections were identified in 66 of the 450 patients studied giving an overall prevalence rate of 14.7%. The contributions of Candida albicans, Gardnerella vaginalis and Trichomonas vaginalis to this overall prevalence rates is depicted in table 2, with Candida albicans constituting the highest prevalence of 7.1% of all infections. The distribution, by age of he patients is shown in Table 3. Age range 15-20 years had the highest prevalence of each of the infections, but this is not statistically significant (P> 0.05).

Table 4 shows the distribution of the sample population by age group. When compared and contrasted with table 3, it is seen that the prevalence of genital tract infections is not significantly associated with the patients' ages (P> 0.05).

Table 5 shows the distribution of the patients by occupation. The prevalence of each of the infections was highest among students and was lowest among housewives and business executives. These differences were statistically significant (P= 0.034).

The distribution of the educational attainment of the patients is shown in Table 6. It indicates that the prevalence of the specific genital infections increased with increasing educational level, being lowest among those with no formal education and highest in patients with post secondary educational qualifications. The difference was statistically significant (P=0.034, for linear trend= 0.90). One hundred and eight (108) of the 296 married women tested had evidence of genital infections compared to 64 of the 154 women who were not currently married. This difference, however, was not statistically significant (P>0.05).

Figure 1

Table 1. Result of Pap smear in 450 subjects

Class of Pap smear	No	% age
Normal	205	45.6
Specific Infections	66	14.7
Non specific information	58	12.9
CIN	73	16.2
HPV changes	48	10.7
Total	**450**	**100**

Figure 2

Table 2. Percentage distribution of the organisms

Organism	No	%
Candida albicans	32	7.1%
Gardnerella vaginalis	23	5.1%
Trichomonas vaginalis	11	2.4%
Candida albicans+ Gardnerella vaginalis	8	1.8%
Overall Prevalence	14.7%	N= **450**

Figure 3

Table 3. Prevalence of infections by age

Age (Years)	*C. albicans* No (%) n=32	*G. vaginalis* No. (%) N=23	*T. vaginalis* No. (%) N=11
15-20	10 (31.3)	6(26.1)	3(27.3)
21-26	7 (21.9)	5(21.7)	3(27.3)
27-32	5(15.6)	5(21.7)	2(18.2)
33-38	5(15.6)	3(13.0)	1(9.1)
39-44	3 (9.4)	2(8.7)	1(9.1)
>45	2(6.3)	2(8.7)	1(9.1)

Figure 4

Table 4. The distribution of the sampled population by age group

Age (Years)	No	%
15-20	90	20
21-26	84	18.67
27-32	81	18
33-38	78	17.33
39-44	59	13.11
>45	58	12.89
Total	**450**	**100**

Figure 5

Table 5. Prevalence of infections by occupation

Occupation	*C. albicans* No (%) n=32	*G. vaginalis* No. (%) n=23	*T. vaginalis* No. (%) n=11
Housewife	1 (3.1)	0 (0)	0(0)
Business executive	1 (3.1)	0 (0)	0(0)
Professional	1 (3.1)	1 (4.3)	0(0)
Civil Servant	4 (12.5)	3 (13.0)	1(9.1)
Petty Trader	5 (15.6)	4(17.4)	1(9.1)
Apprentice	5 (15.6)	4 (17.4)	2(18.2)
None	6 (18.8)	5 (21.7)	3(27.3)
Student	9 (28.1)	6 (26.1)	4(36.4)

Figure 6

Table 6. Prevalence of infections by educational level

Educational level	*C. albicans* No (%) n=32	*G. vaginalis* No. (%) n=23	*T. vaginalis* No. (%) n=11
None	6 (18.8)	3(13.0)	1(9.1)
Primary	5 (15.6)	4 (17.4)	0 (0)
Secondary	9 (28.1)	7 (30.4)	4 (36.4)
Post-secondary	12 (37.5)	9 (39.1)	6 (54.5)

DISCUSSION

The prevalence of specific genital infections in this study which was 14.7% is similar to the 13.7% and 14.2% reported by Konje et al [6] from Ibadan and Ngokere and Ofordile [11] from Enugu. The prevalence of Gardnerella vaginalis, the major aetiological organism of bacterial vaginosis, in this study of 5.1% is much lower than the 40.8% reported by Adinma et al [1] from Nnewi, 42% by Oji [13] from Lagos, and 10% by Chowdhury et al [14] in India. Variations in incidence are invariably related to the characteristics of the population studied, the period of study, the technique used in isolating the organisms and the presence or absence of symptoms of infections among the patients studied. The low prevalence of genital infections in this study compared to those in Adinma et al [1], Oji [13] and Abudu et al [15] is probably due to the fact that virtually all the patients (87%) were asymptomatic.

The prevalence of genital tract infections in this study was not statistically associated with the patients' ages (P> 0.05). This is an agreement with the finings of Adinma et al [1] and Konje et al [6]. There were also few cases occurring towards the end of reproductive life (>45 years) and this is also in concordance with the reports of Cristiano et al [16] and Bro[17]. These findings may probably be attributed to the reduction in general activity, including sexual performance, associated with this stage of life. This study shows that he highest incidence of sexually transmitted genital infections (e.g. T. vaginalis) occurred among students and those not currently engaged in any economic activity, while those with secured means of livelihood such as housewives and business executives were at least risk of contacting T. vaginalis. The underlying factor might be multiple sexual partners as those who engage in sexual promiscuity usually do so for economic reasons[18]. Married women, probably due to marital stability with one sexual partner have less likelihood of exposure to male carriers of genital infections compared to single sexually active women who would probably have multiple sexual partners and have greater chances of encountering a male carrier of these infections.

The prevalence of genital infections increased with increasing levels of educational qualification in this study and is indeed significantly higher among those who with tertiary compared to those who never had any form of formal education. Patients in secondary and tertiary institutions by reason of their age, and the influence of reduced or absent parental control are more likely to be more sexually promiscuous, especially in these days of worsening difficulty and decaying societal moral values.

This study had shown the place of cervical cytology in the diagnosis of genital tract infections and their association with some biosocial variables. Such socio-demographic factors may be useful in risk scoring. This is important because risk scoring systems have the potential for assisting the targeting of screening resources, as broad risk targeting of all sexually active women for sexually transmitted infections screening is not a viable option for developing countries due to paucity of both human and financial resources. Even in the industrialized nations of the West, the need for more precise targeting of high risk groups in order to improve the efficiency of sexually transmitted infections screening programmes and conserve funds have become a major issue[18]. There is need for an increased use of this cost effective and diagnostic tool in the diagnosis of genital tract infections, especially in centres with organized cervical cytology screening programmes and in low resource areas where there might be shortage of manpower and facilities might not be adequate since it is essentially an office procedure.

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