

Symptomatic Genital Mycoplasmal Infections Among Ante-Natal Women In An Urban Community Of Northern Nigeria And The Need To Possibly Widen The Scope Of Present Laboratory Investigations

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Citation

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Abstract

Aim To establish the incidence of symptomatic genital Mycoplasma infections among antenatal women in Jos, Nigeria. **Methods** High vaginal and Endocervical swabs (HVS/ECS) samples were obtained consecutively from 283 antenatal women that volunteered to enroll in the study. Samples were processed using standard laboratory procedures for the isolation of Mycoplasma species while information such as age, marital status, occupation and other clinical data were obtained using a questionnaire. The results obtained were analysed using SPSS 11.0 statistical methods and P values ≤ 0.05 were considered significant.

Results The overall incidence of genital Mycoplasma infection among the 283 antenatal subjects was found to be 32.5% (n=92); M. hominis was 12.7% (n=36), U. urealyticum 16.6% (n=47), other Mycoplasmas 3.5% (n=9), and mixed M. hominis and U. urealyticum 7.4% (n=21). There was no significant age difference and occupation with the rate of isolation of genital Mycoplasmas among the subjects ($P > 0.05$); however, there was a significant association of recovery of genital Mycoplasmas with a positive history of vaginal discharge while majority (>95%) of the non specific bacteria (Escherichia coli, Klebsiella spp., Proteus mirabilis and Enterococcus spp.) were recovered from women with background Mycoplasma infections ($p < 0.05$).

Conclusion Genital Mycoplasmas have been shown to be among the agents that cause, or influence symptomatic genitourinary infections among antenatal women; hence efforts should be made for their recovery especially on persistent isolation of non specific bacteria from genital specimens.

INTRODUCTION

The commonest species of Mycoplasma causing genital tract infections are Mycoplasma hominis, Ureaplasma urealyticum and Mycoplasma genitalium^{1,2}. This tissue and organ specificity has been linked with a set of closely related genetically defined factors responsible for tissue specificity of these Mycoplasmas^{3,4}. It is this same genetic disposition that has also been attributed to the association of Mycoplasma pneumoniae with the respiratory tract; although of recent M. genitalium has been isolated from the respiratory tract and M. pneumoniae from the genital tract; these are few exceptions^{5,6,7}.

Bacterial endometrialis which is a sub-clinical bacteria of the endometrium, which in most cases is due to prior bacterial vaginosis has been linked with several obstetric and

gynaecological disorders of Mycoplasma has played a significant role; these include: recurrent abortion, dysfunctional uterine bleeding, pelvic pain, premenstrual syndrome, premature labor, placental insufficiency and pre-eclampsia^{8,9,10}.

Mycoplasmas have been implicated in several cases of unexplained infertility; usually establishing such a diagnosis is not easy due to the level of skillful procedures required, and hence, plasma cells, which are evidence of chronic infection and foci of lymphocytes in the endometrium may be the sole clue of Mycoplasma endometritis^{11,12,13}. Koren and Spigland¹⁴ (Koren, & Spigland, 1978) found out that: endometrial washings taken from 59 women with unexplained infertility showed 16 patients (27%) to prove positive for Mycoplasma, and five (31%) of these conceived

within few months of the 7-day course of the antibiotic, doxycycline. Bercovici et al¹⁵ found out that, Mycoplasma was isolated from 18% of infertile women, though patients with evidence of Mycoplasma in the endometrium had no specific histologic feature. In another study, Idriss et al¹⁶ conducted on 161 consecutive infertility patients and 67 controls for *U. urealyticum*; of the patients with unexplained infertility, 55% had a positive culture from the endocervix compared with 32% of the controls.

In the tropical and sub-tropical parts of the world, little requests are often made by clinicians for the isolation of Mycoplasma in the investigation of nongonococcal urethritis/ cervicitis in general^{17,18,19}. Similarly, specific laboratory investigations for isolation of genital Mycoplasmas from genital samples in cases of unexplained infertility is rarely carried out in most parts of the developing world^{20,21}. The possibility of patients being under investigated and hence misdiagnosed with inappropriate treatment cannot be ruled out in such circumstances^{22,23,24,25}.

Considering the role Mycoplasmas play in cases of unexplained infertility and the outcome of pregnancies; and the fact that, routine search for the organism from genital samples in health centres in the tropical and subtropical parts of the world is still quite low; and the need to sustain the improvement in female reproductive health in these parts of the world: this study was set up to ascertain the vaginal mycoplasmal density among pregnant women. The findings will be a useful piece of information as regards the depth of colonization of the organism in the locality and probably raise some level of awareness for its existence and proper control.

MATERIALS AND METHODS

Settings The study was conducted in Jos between February and April 2006; Jos is the Plateau state capital. Based on 2006 population census, her population is estimated at 650,000 people. The weather is temperate in nature suitable for habitation and is endowed with interesting tourist sites; it is predominantly a Christian city but has a sizable number of Moslems, while believers of other faiths are much fewer; the majority of the occupants are traders, farmers, civil servants, students and applicants. There are three major hospitals in the city: Jos University Teaching Hospital (JUTH), Plateau State Specialist Hospital (PSSH), and Evangel Hospital.

Selection of Subjects An active hospital based survey was carried out at PSSH hospital, Evangel Hospital and

Nassarawa Medical Centre, Nassarawa Gwom all in Jos between December 2004- April 2005. All the willing ante-natal women attending the designated health centres for routine ante-natal visits within the four months study period were consecutively recruited for the study. Subjects without symptoms and signs of vaginal discharge, or itching, constituted positive control.

Procedure A well structured questionnaire was administered either self or interviewer and items such as: age, occupation, clinical symptoms such as vaginal discharge, itching and low abdominal pain was highlighted. Proper history on the subjects was able to differentiate clinical discharge from physiologic. High vaginal swab (HVS) and endocervical swab (ECS) samples were collected, transported, stored and processed using standard laboratory procedures^{1,26,27}. Control organisms for *M. hominis* and *U. urealyticum* were used while that of *M. genitalium* was unavailable. All the samples were processed at the National Veterinary Research Institute (NVRI) Vom, about 35 kilometres south of Jos city.

Ethical Considerations Ethical approval for the study was obtained from the Ethical committee of the Plateau state ministry of Health.

RESULTS

The incidence of genital Mycoplasma among the 283 ante-natal women studied in Jos was found to be 32.5% (n=92). Evaluation of cumulative genital Mycoplasma infections with age distribution pattern showed that, 1(50%), 3(30%), 10 (29.4%), and 25 (40.9%) were recovered from those who were <15, 16-20, 21-25, and 26-30 years respectively, and, 8 (25%), 2 (10.5%), and 2 (15.3%) from those who were in the age range 41-45, 46-50, and 51-55 years respectively. The rate of infection was generally lower at ages less than 25 and above 40 years but peaked at ages 26 to 40 years old. There was no significant age difference in the rate of recovery of the species of Mycoplasma ($P > 0.05$), (Table 1).

An analysis of the age distribution pattern and the species of Mycoplasma recovered from the antenatal women showed that, *M. hominis* and *U. urealyticum* were recovered from 12.7% (n=36) and 16.6% (n=47) subjects respectively. Other Mycoplasmas were recovered from 9 (3.5%) subjects, and, mixed *M. hominis* and *U. urealyticum* was recovered from 7.4% (n=21) of the subjects, (Table 1).

An analysis of genital Mycoplasma infection among the antenatal women based on occupation showed that: 10.6%

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(n=30) applicants, 6.4% (n=18 petty traders, 4.2% (n=12) teachers, 7.4% (n=21) farmers, 1.7% (n=5) businesswomen and 1.7% (n=5) medical workers were infected with genital Mycoplasmas. There was no significant association between rate of Mycoplasma infection and the various occupations of the respondents ($P > 0.05$), (Table 2).

Concerning the rate of recovery of genital Mycoplasmas from the ante-natal women based on the presence or absence of symptoms and signs of vaginal discharge, it was found that: of the 23 subjects with features of symptomatic vaginal discharge, 17 (83%) were infected with genital Mycoplasma compared to the 75 (28.8%) of the 260 subjects without such features ($p < 0.05$), (Fig. 1).

Microorganisms recovered from the 23 subjects with features of infection include; *Candida* spp. 6(26.1%), *Escherichia coli* 5(21.7%), *Klebsiella* spp. 4 (17.4%), *Proteus mirabilis* 3 (13.4%), and *Enterococcus* spp. 2(8.7%). All the bacteria were recovered from subjects with Mycoplasma infection, while Mycoplasma only was recovered from 3 (13.4%) subjects, ($P < 0.05$), (Fig. 2).

Figure 1

Table 1: Incidence of genital among antenatal women in Jos based on age distribution.

Age* (Years)	<i>M. hominis</i> ¹ (%)	<i>U. urealyticum</i> ² (%)	Others ³ (%)	NIL (%)	Total (%)
<15	0 (0.0)	1 (0.4)	0 (0.0)	1 (0.4)	2 (0.8)
16-20	0 (0.0)	3 (1.1)	0 (0.0)	7 (2.5)	10 (3.6)
21-25	3 (1.1)	6 (2.1)	1 (0.4)	24 (8.4)	34 (12.0)
26-30	12 (4.2)	11 (3.9)	2 (0.7)	36 (12.7)	61 (21.5)
31-35	11 (3.9)	9 (3.1)	3 (1.0)	43 (15.2)	66 (23.3)
36-40	4 (1.4)	13 (4.5)	1 (0.4)	27 (9.6)	45 (15.9)
41-45	4 (1.4)	3 (1.1)	1 (0.4)	24 (8.4)	32 (11.3)
46-50	2 (0.7)	0 (0.0)	0 (0.0)	17 (6.0)	19 (6.7)
51-55	0 (0.0)	1 (0.4)	1 (0.4)	11 (3.9)	13 (4.5)
> 55	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)	1 (0.4)
Total	36 (12.7)	47 (16.6)	9 (3.2)	191 (67.5)	283 (100)

NB: Mixed *M. hominis* and *U. urealyticum* was observed in 7.4% (n=21) of the subjects.

$P = 0.85$

Figure 2

Table 2: Rate of genital infection among ante-natal women in Jos based on occupation*.

Occupation	<i>Mycoplasma</i> present (%)	<i>Mycoplasma</i> absent (%)	Total (%)	P values
Applicant	30 (10.6)	45 (15.9)	75 (26.5)	> 0.05
Petty Trader	18 (6.4)	35 (12.4)	53 (18.7)	> 0.05
Teaching	12 (4.2)	26 (9.2)	38 (13.4)	> 0.05
Farming	21 (7.4)	39 (13.8)	60 (21.2)	> 0.05
Business	5 (1.7)	17 (6.0)	22 (7.8)	> 0.05
Medical worker	5 (1.7)	23 (8.1)	28 (9.9)	> 0.05
Others**	1 (0.4)	6 (2.1)	7 (2.5)	> 0.05
Total	92 (32.5)	191 (67.5)	283 (100)	

*Full time house wife was grouped under applicant.

** Administrative secretary, Typist, Student, Accountant.

Figure 3

Figure 1: Rate of recovery of Genital from antenatal women based on a positive history of vaginal discharge.

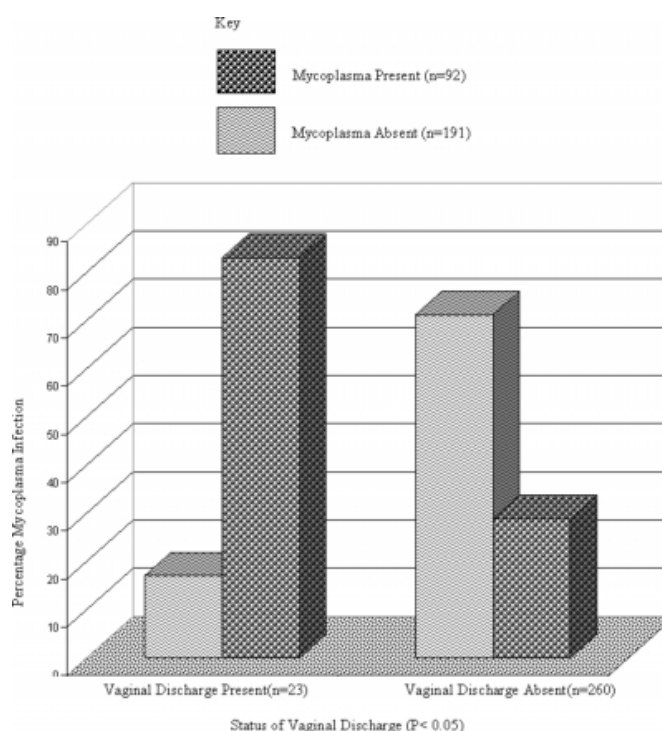
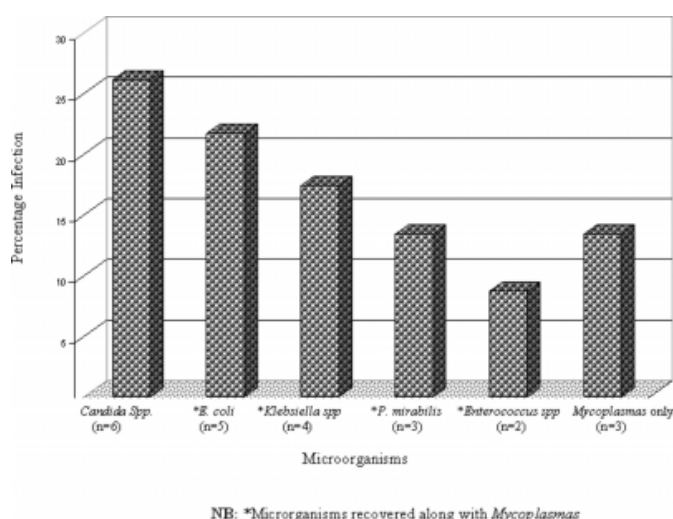


Figure 4

Figure 2: Microorganisms recovered from antenatal women with symptoms and signs of vaginal discharge



DISCUSSION

The incidence of genital Mycoplasma among antenatal women in Jos was 32.5%; *M. hominis*, 12.7%; *U. urealyticum*, 16.6%; mixed infection, 7.4%, and other Mycoplasmas, 3.5% with no significant age difference in the age of recovery ($P > 0.05$). This stresses how common genital Mycoplasma infections are among females in the community and the need to look out for them from genital samples.

The findings from this study compare well with that of: Casin, et al, in Paris, France²⁸ who reported a higher figure of 38% genital Mycoplasma from women using polymerase chain reaction (PCR); Kiche, et al, in Kirikkale, Turkey²⁹, who reported a much higher figure of 48% using Mycoplasma IST method; Japsin, et al, who reported 26.3% *M. genitalium* alone among female sex workers across west Africa³⁰; and Andrade-Rocha in Brazil³¹ who reported over 28% genital Mycoplasma infection among 234 semen samples of patients with varying urogenital symptoms. In addition to the varying sensitivities and specificities adopted in various study centres; which is capable of yielding varying results; the degree of risky sexual exposures could as well influence these outcomes³². Moreover, the study in France was conducted on a group more at risk of recovering such organisms compared to the present study. Similar findings were reported by: Cohen, et al, in Kenya³³, Morency, et al, in Bangui, Central African Republic³⁴, and Clegg, et al, in Papua New Guinea³⁵.

The rate of genital Mycoplasma infection was found to be

significantly ($P < 0.05$) associated with a positive history of vaginal discharge, as 83% of the 23 subjects with such symptoms harbored the organism. This association has also been reported by Dabattista et al,³⁶. The recovery of all the species of *Escherichia coli*, *Klebsiella* spp., *Proteus mirabilis* and *Enterococcus* spp. from women with background symptomatic Mycoplasma infections points to the need to look out for Mycoplasma on persistent isolation of such nonspecific organisms. The association of genital Mycoplasma with symptomatic isolation of non specific bacteria has also been reported by Casin, et al, in France²⁸, as well as Clegg, et al, in Papua New Guinea³⁵. The most appropriate choice of antibiotics for patients with this pattern of laboratory finding would require those targeted at Mycoplasmas for efficient treatment.

The lack of association of occupation with the rate of Mycoplasma infection in this community may be an incidental finding, since most sexually transmitted infections flow along socio-economic planes. It could also be a pointer to possibly, extra-sexual means of transmission of which further research would be required to establish the validity of the view.

The findings from this study are however different from that of: Alary, et al, in Cotonou, Benin Republic³⁷; Obiechina, et al, in Onitsha, Nigeria¹⁸; Oyelese, et al, in Ile-Ife³⁸, and Nwosu, et al, in a rural study in Nigeria³⁹ where Mycoplasmas were not recovered from urogenital samples. The methodologies employed for the processing of these genital samples were not conducive for the isolation of Mycoplasmas. In view of the roles Mycoplasmas play in the outcome of several obstetric and gynaecological problems, genital samples for culture should not be spared the right of isolation of Mycoplasmas by putting in place all the necessary laboratory procedures required for their isolation

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In conclusion, Mycoplasmas are not as rare causes of symptomatic female genital tract infections as might have been the thinking. Screening for them among both antenatal and generally women of reproductive age group would be a worthwhile exercise especially in cases of persistent symptomatic isolation of non specific bacteria from genitourinary samples. With appropriate subsequent treatment, this could forestall the anticipated obstetric problems that might arise thereafter due to mycoplasmal infections.

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