

Symptomatic and asymptomatic infections of the lower genital tract in pregnant and non-pregnant women of reproductive age

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Objectives

- To investigate the prevalence of bacterial and fungal pathogens in pregnant and non pregnant women of reproductive age over a two-year period

Materials and Methods (I)

- Between October 2009 and October 2011, 8,403 pregnant and non-pregnant women aged 16-42 years attending the department of Obstetrics and Gynecology of “Alexandra” Hospital of Athens were tested for bacterial and fungal pathogens of the lower genital tract
- Combined cervical and vaginal or vaginal and urethral swabs were obtained from non-pregnant and pregnant women respectively

Materials and Methods (II)

- The specimens were cultured onto chocolate agar, chromogenic sabouraud dextrose agar, Columbia CNA blood agar with colistin and nalidixic acid and A7 Mycoplasma agar
- *Chlamydia trachomatis* were detected in cervical or urethral specimens by immunofluorescence assay
- Vaginal swabs were used for wet mount microscopy (detection of yeasts, *Trichomonas vaginalis*, polymorphonuclear leucocytes, clue cells) and preparation of Gram stain
- Bacterial vaginosis (BV) was diagnosed based on at least three Amsel criteria and Nugent scoring system

Results (I)

- Pathogens were identified in 2,282 (40.68%) out of 5,610 non-pregnant and 1,039 (37.20%) out of 2,793 pregnant women examined
- The frequency of *Candida albicans*, non-*C. albicans*, BV, group B *Streptococcus* (GBS), group A *Streptococcus* (GAS), *C. trachomatis*, *M. hominis*, *U. urealyticum*, *T. vaginalis*, and mixed infection (more than one pathogen) was 29.14%, 17.88%, 16.87%, 10.08%, 0.44%, 8.28%, 0.22%, 3.47%, 1.70%, 11.92% in non-pregnant and 41.48%, 24.54%, 7.80%, 8.95%, 0%, 1.64%, 0%, 3.95%, 1.73%, 9.91% in pregnant women respectively (tables 1, 2)
- *Neisseria gonorrhoeae* was not detected in any specimen

tract infections in **non-pregnant** women of reproductive age

Pathogens	Leukocytes	
	No. (%)	No. (%)
<i>Candida albicans</i>	245 (32.36)	665 (29.14)
non- <i>C.albicans</i>	120 (15.85)	408 (17.88)
Bacterial vaginosis	108 (14.27)	385 (16.87)
Group B <i>Streptococcus</i> (GBS)	70 (9.25)	230 (10.08)
Group A <i>Streptococcus</i> (GAS)	0 (0)	10 (0.44)
<i>Chlamydia</i>	54 (7.13)	189 (8.28)
<i>M. hominis</i>	1 (0.13)	5 (0.22)
<i>U. urealyticum</i>	15 (1.98)	79 (3.47)
<i>T. vaginalis</i>	29 (3.83)	39 (1.70)
Mixed infection	115 (15.20)	272 (11.92)
Total	757/2282 (33.17%)	2,282

lower genital tract infections in pregnant women

	Leukocytes No (%)	Pregnant women No (%)
<i>Candida albicans</i>	156 (48.15)	431 (41.48)
non- <i>C.albicans</i>	66 (20.37)	255 (24.54)
Bacterial vaginosis (BV)	27 (8.33)	81 (7.80)
Group B <i>Streptococcus</i> (GBS)	13 (4.01)	93 (8.95)
Group A <i>Streptococcus</i> (GAS)	0 (0)	
<i>Chlamydia</i>	1	17
<i>M. hominis</i>	0	0 (0)
<i>U. urealyticum</i>	6 (1.85)	41 (3.95)
<i>T. vaginalis</i>	11 (3.40)	18 (1.73)
Mixed infection	44 (13.58)	103 (9.91)
Total	324/1,039 (31.18%)	1,039

Results (II)

- ❑ Leukocytes were detected in 33.17 % of non-pregnant and in 31.18% of pregnant women found positive for pathogens
- ❑ For a total number of non-pregnant (5,610) and pregnant women (2,793) studied, the prevalence of GBS was 4.09% and 3.33% respectively (table 3)
- ❑ Statistical analysis by χ^2 test showed statistically significant: (a) higher frequency of BV and *Chlamydia* infection in non-pregnant and (b) higher rate of *Candida* infection in pregnant women (table 4)

Table 3. Prevalence of group B *Streptococcus* (GBS) among non-pregnant and pregnant women

Women studied	Total number/ positive for GBS	Prevalence %	P, OR (odds ratio), 95% CI (confidence interval)
Non-pregnant	5,610/230	4.09	P=0.08; OR=1.25; 95% CI=0.97-1.6
Pregnant	2,793/93	3.33	

Table 4. Pathogens with statistically significant difference in infection rate among non-pregnant and pregnant women

Pathogens	Non-pregnant women No (%)	Pregnant women No (%)	P, OR (odds ratio), 95% CI (confidence interval)*
<i>Candida albicans</i>	665 (29.14)	431(41.48)	P<0.0001; OR=1.72; 95% CI=1.48-0.01
Non- <i>Candida albicans</i>	408 (17.88)	255 (24.54)	P<0.0001; OR=1.44; 95% CI=1.21-1.72
Bacterial vaginosis	385 (16.87)	81 (7.80)	P<0.0001; OR=2.40; 95% CI=1.87-3.09
<i>C. trachomatis</i>	189 (8.28)	17 (1.64)	P<0.0001; OR=38.8; 95% CI=23.2-64.8

*comparison of variables by chi-square test

Conclusions

- *Candida* spp is the most common pathogen in both groups with higher infection rate in pregnant women
- The frequency of BV and *Chlamydia* infection is higher in non-pregnant than in pregnant women, whereas there is no statistically significant difference in GBS prevalence among the two groups