



Frequency and antimicrobial susceptibility of *Ureaplasma urealyticum* and *Mycoplasma hominis* in 4 groups of patients with vaginal discharge over a decade



S. Baka, E. Saltaoura, S. Karkatzouli, V. Gennimata, A. Chasiakou, E. Kouskouni

Department of Biopathology, Aretaieio University Hospital, Athens, Greece

Objectives:

Ureaplasma urealyticum (Uu) and *Mycoplasma hominis* (Mh), members of a unique group of microorganisms that commonly colonize the female genital system, have been associated with a plethora of genital tract infections with different clinical manifestations such as pelvic inflammatory disease, salpingitis, bacterial vaginosis, infertility, ectopic pregnancy, obstetric pathologies and perinatal disorders. International research suggests an increase in genital mycoplasmas infections over the last decade while the reported prevalence varies significantly in different parts of the world. We aimed to study the prevalence and the susceptibility to antibiotics of Uu and Mh isolated from the vaginal secretions of 4 different groups of patients.

Methods: Vaginal samples from 5104 symptomatic patients presenting with vaginal discharge to the Outpatient Clinic of Aretaieion University Hospital from January 2004 to December 2013 were studied. Cases were divided into 4 age groups (girls 2-17 years old, reproductive age women 18-45 years, pregnant women and postmenopausal women >50 years old) and each group was studied during 2 time periods (2004-2008 and 2009-2013). For the isolation and susceptibility testing of both mycoplasmas the commercial kit *Mycoplasma* IST2 (BioMerieux, France) was used. After inoculation onto the respective nutrient medium, the samples were incubated at 36-37°C for 48h in aerobic conditions. Only concentrations of > 10⁴ CFU/ml at 48h were included as positive samples in the study.

Groups	2004-2008	2009-2013
Total samples	2750	2354
Positive samples	719 (26%)	464 (20%)
Uu	631 (88%)	418 (90%)
Mh	7 (1%)	5 (1%)
Uu+Mh	81 (11%)	41 (9%)
Girls	39 (5%)	22 (5%)
Reproductive age	530 (74%)	276 (59%)
Pregnant	19 (3%)	55 (12%)
Postmenopausal	131 (18%)	111 (24%)

Conclusions: Our study confirms the continuously changing antimicrobial resistance of genital mycoplasmas. The isolates studied were highly resistant to quinolones, due to the increased and irrational use in the last years. Interestingly, significantly decreased susceptibility to quinolones was observed in children. This finding must alarm clinicians to stop empirical treatment and adhere to strict criteria based on local patterns of antimicrobial resistance for optimal therapeutic approach.

Results: Out of the 5104 samples, 2750 were collected between 2004-2008 and 2354 during 2009-2013. During 2004-2008, 719 (26%) samples were positive for mycoplasmas (88% Uu, 7% Mh and 11% Uu+Mh). The distribution of the positive samples among groups was as follows: girls 5%, reproductive age women 74%, pregnant women 3% and postmenopausal women 18%. During 2009-2013, 464 (20%) samples were positive (90% Uu, 1% Mh and 9% Uu+Mh) while the distribution among groups was: girls 5%, reproductive age women 59%, pregnant women 12% and postmenopausal women 24%. As for the susceptibility testing to antibiotics, a tendency to increased antimicrobial resistance in the isolates of the second time period studied was noted. However, doxycycline, tetracycline, josamycin and pristinamycin displayed the lowest percentages of resistance. The macrolides clarithromycin, azithromycin and erythromycin displayed comparable rates of resistance in both periods studied. In contrast, the genital mycoplasmas tested showed decreased susceptibility to quinolones with significantly increased rates in the group of children in the second period studied.

2004-2008	DOT	JOS	OFL	ERY	TET	CIP	AZI	CLA	PRI
Girls	2,6	2,6	38,4	10,2	2,6	33,3	7,7	7,7	2,6
Reproductive age	1,9	1,9	48,3	21,5	2,8	81,8	20,7	12,2	5,6
Pregnant	2,6	10,5	31,5	15,8	5,3	84,2	15,8	10,5	2,6
Postmenopausal	3,8	3,5	49,6	23,6	3,8	90	17,5	21,3	6

2009-2013	DOT	JOS	OFL	ERY	TET	CIP	AZI	CLA	PRI
Girls	4,5	9	59	27	9	77	18	14	9
Reproductive age	0,4	0,7	63	19	2,5	88	21	15	6
Pregnant	1,8	1,8	38	18	3,6	89	14,5	18	5,5
Postmenopausal	1	1	51	16	3,6	84	14,5	7,2	1

(DOT: doxycycline; JOS: josamycin; OFL: ofloxacin; ERY: erythromycin; TET: tetracycline; CIP: ciprofloxacin; AZI: azithromycin; CLA: clarithromycin; PRI: pristinamycin)