

# Intra-amniotic infection: etiology and adverse pregnancy outcome

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## Abstract

**Objectives.** Intra-amniotic infection (IIA) is a symptomatic or subclinical complication of pregnancy that can lead to fatal consequences, especially for the fetus. The aim of this study was to describe the etiology of IIA in our hospital by analyzing amniotic fluid (AF) cultures as well as pregnancy outcome in a group of patients with genital mycoplasmas infection versus another group with other bacteria or yeast in the AF.

**Methods.** Patients admitted to our institution during the period 2009-2012 with preterm labor, premature rupture of membranes (PROM) and/or suspected IIA, and undergoing amniocentesis were included in this retrospective study. AF analysis consisted of culture for aerobic and anaerobic bacteria as well as for genital mycoplasmas. Pregnancy outcome were obtained from medical charts.

**Results.** Out of 632 samples from 546 pregnant women, 124 (19.6%) cultures were positive, corresponding to 120 (22.0%) patients. These patients were divided into two groups according to the results of AF culture: 45 (37.5%) pregnant women with positive AF culture only for genital mycoplasmas and 76 (62.5%) with a positive AF culture for other bacteria, yeasts or mixed microorganisms. The most frequent isolates were *Ureaplasma* spp in 43 (35.7%) cases, *Fusobacterium* spp in 12 (9.7%) and *Listeria monocytogenes* in 11 (8.9%). IIA was polymicrobial in 11 cases (8.9%). 4 patients had a second IIA after recovery from the first one. 13 pregnant women and 4 neonates in the group of non-mycoplasma isolates had positive blood cultures. All patients showed premature delivery.

**Conclusion.** *Ureaplasma* spp was the most prevalent microorganism isolated in AF from pregnant women with IIA. Adverse pregnancy outcomes occurred more frequently in women with positive cultures for nonmycoplasma or mixed microorganisms than in those with genital mycoplasmas alone. However, the results obtained suggest the need for routine performance of genital mycoplasmas culture in AF of pregnant women with suspected clinical or subclinical IIA.

## Objectives

Intra-amniotic infection (IIA) is a symptomatic or subclinical complication of pregnancy that can lead to fatal consequences, especially for the fetus. The aim of this study was to describe the etiology of IIA in our hospital by analyzing amniotic fluid (AF) cultures as well as pregnancy outcome in a group of patients with genital mycoplasmas infection versus another group with other bacteria or yeast in the AF.

## Methods

Patients admitted to our institution during the period 2009-2012 with preterm labor, premature rupture of membranes (PROM) and/or suspected IIA, and undergoing amniocentesis, were included in this retrospective study. AF analysis consisted of culture for aerobic and anaerobic bacteria as well as for genital mycoplasmas (Mycoplasma IST 2, bioMérieux) (Figure 1). Pregnancy outcome were obtained from medical charts. For statistical analysis the t-test, the Mann-Whitney U-test or the Chi-square test were used.

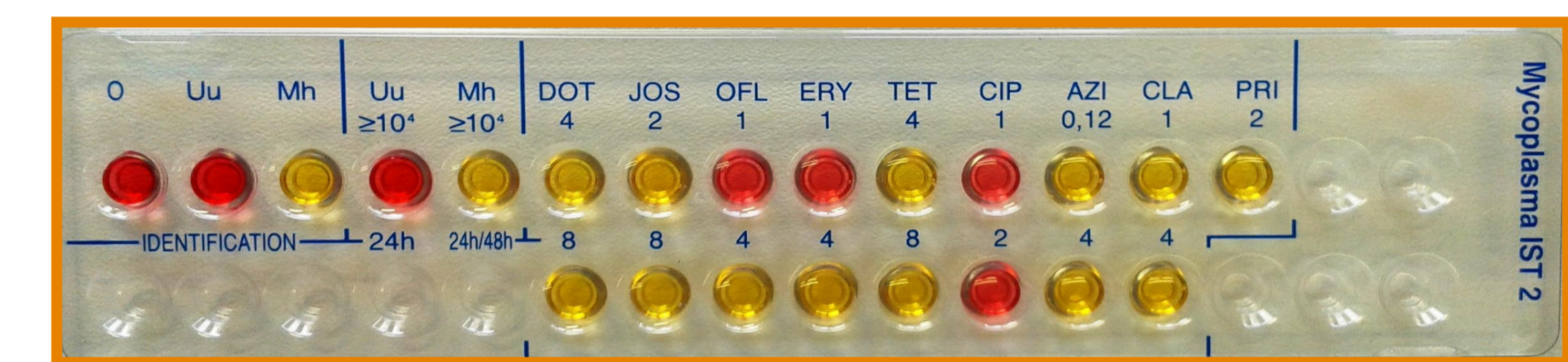


Figure 1. Positive Mycoplasma IST 2 gallery for *Ureaplasma* spp.

## Results

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Table 1. Identification and number (N) of isolates in the analyzed AF cultures.

ISOLATES	N		
<i>Ureaplasma</i> spp	43	Other anaerobis <sup>B</sup>	6
<i>Fusobacterium</i> spp	12	Polymicrobial: bacteria	5
<i>Listeria monocytogenes</i>	11	Other Gram negative bacteria <sup>C</sup>	5
Viridans group streptococci	9	<i>Ureaplasma</i> spp + <i>Mycoplasma hominis</i>	5
<i>Escherichia coli</i>	7	<i>Streptococcus agalactiae</i>	4
<i>Candida</i> spp <sup>A</sup>	7	Other Gram positive bacteria <sup>D</sup>	4
Polymicrobial: bacteria + mycoplasmas	6	<b>TOTAL</b>	<b>124</b>

A: 5 *Candida albicans*, 2 *C. glabrata*; B: *Bacteroides vulgatus*, *Peptostreptococcus* spp, *Peptophilus harei*, *Prevotella bivia*, *Porphyromonas* spp and *Propionibacterium* spp; C: 2 *Capnocytophaga sputigena*, *Campylobacter jejuni*, *Haemophilus influenzae* and *Morganella morganii*; D: *Staphylococcus epidermidis*, *S. caprae*, *Enterococcus faecalis* and *Gardnerella vaginalis*.

## Conclusion

*Ureaplasma* spp was the most prevalent microorganism isolated in AF from pregnant women with IIA. Adverse pregnancy outcomes occurred more frequently in women with positive cultures for nonmycoplasma or mixed microorganisms than in those with genital mycoplasmas alone. However, the results obtained suggest the need for routine performance of genital mycoplasmas culture in AF of pregnant women with suspected clinical or subclinical IIA.

Table 2. Comparison of data on pregnancy outcome between the two groups of patients (mean plus standard deviation or percentage).

	Mycoplasma group	Non-mycoplasma group	p
<b>Pregnant women (N)</b>	45	75*	
•Age (years)	31.0 ± 5.7	32.2 ± 5.4	0.4
•Twin pregnancies (%)	4.4	17.3	0.002
•Week of pregnancy at admission	28.5 ± 4.2	26,1 ± 5.3	0.009
•Week of pregnancy at PROM	28.9 ± 4.1	25.9 ± 5.4	0.002
•Week of pregnancy at amniocentesis	28.9 ± 4.3	26.3 ± 5.2	0.006
•Antibiotics received (%)	91.1	95.9	0.28
•Week of pregnancy at delivery	29.8 ± 3.7	26.6 ± 5.2	1.9*10 <sup>-4</sup>
•Delivery before 24 weeks (%)	8.9	23.0	0.05
•Intrapartum fever (%)	6.7	29.3	0.003
<b>Newborns (N)**</b>	47	87	
•Neonatal weight (g)	1486 ± 687	1078 ± 651	0.001
•Weight less than 1000 g (%)	25.5	55.2	0.001
•Intrauterine death (%)	8.5	23.0	0.04
•Neonatal death (%)	6.4	8.0	0.7
•Global death (%)	14.9	31.0	0.04

\* One patient was lost to follow up before delivery. \*\* 14.3% of twin pregnancies.