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Real Time Polymerase Chain Reaction (RT-PCR) for detection of *Toxoplasma gondii* DNA on amniotic fluid in primary infections during pregnancy: a safe and reliable diagnostic tool

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Introduction

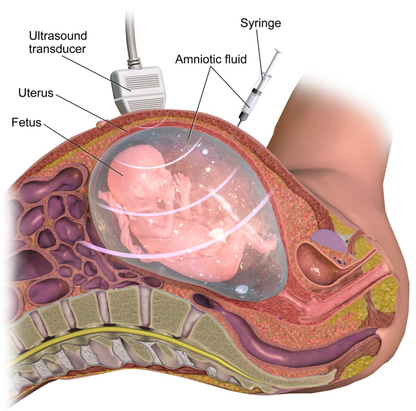
Primary *Toxoplasma gondii* infection during pregnancy can cause Congenital Toxoplasmosis (CT), which can lead to very different clinical outcomes, from asymptomatic to severely compromised newborns.

Monthly serological screening before and during pregnancy is essential for the rapid identification and the correct management of infections.

Detection of *T. gondii* DNA through Real Time Polymerase Chain Reaction (RT-PCR) on Amniotic Fluid (AF) is an important and affordable tool in order to adapt therapeutic and medical care.

The aim of our study was to evaluate sensitivity, specificity and safety of amniocentesis in a cohort of pregnant women with confirmed or suspected diagnosis of acute toxoplasmosis.

Material / Methods



[https://it.wikipedia.org/wiki/Amniocentesi]

We retrospectively reviewed results obtained by RT-PCR on a series of AF samples analyzed at the Parasitology Laboratory of IRCCS Policlinico San Matteo (Pavia), from 2018 to 2021.

Amniocentesis were performed under ultrasound guidance after 18 weeks of gestation and at least 4 weeks after maternal infection with mothers undergoing therapy.

After centrifugation of at least 10 mL of the AF and resuspension of the pellet obtained, samples were tested in duplicate by TOXOPLASMA ELITeMGB (ELITechGroup, Torino, Italy), ELITe InGenius®, a fully automated device, using the highly repeated Rep529 as gene target.

Results

We evaluated 219 amniocentesis (77.2% of infections during the first trimester and 22.8% during the 2nd trimester), of which 200 (91.3%) performed during the 2nd trimester of pregnancy and 19 (8.7%) during the 3rd trimester. No amniocentesis were performed for 3rd trimester infection. Two hundred and seventeen amniocentesis (99.1%) tested negative, and the results were confirmed by one year follow–up of the newborns in 136 cases (62.7%). We could not retrieve the pregnancy outcome in 81/217 (37.3%) cases.

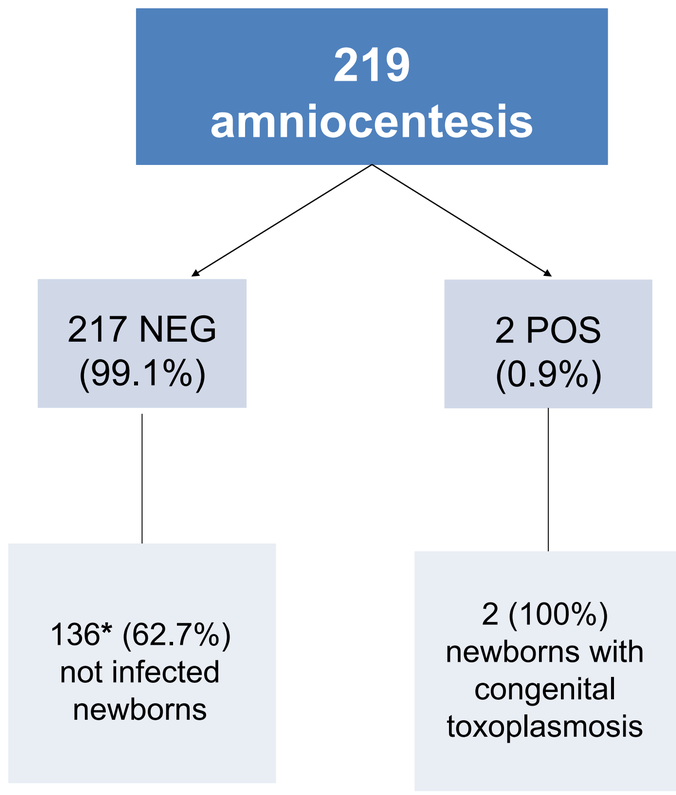
In our cohort no voluntary interruptions of pregnancy were recorded.

In 2 (0.9%) cases prenatal diagnosis tested positive; the first one was a seroconversion at 10 gestational weeks (GW) which led to miscarriage before the procedure. PCR performed on cord blood, placenta and aborted fetus were positive as well.

The second one was from mother's seroconversions at 22 GW, treated with pyremethamine-sulfadiazine and resulting in asymptomatic CT.

No procedure-related complications were recorded (0 fetal loss against 0.8% from literature) and no false positive or negative results were registered (sensitivity 100% CI 96.4-100 and specificity of 100%).

219 Amniocentesis	
2nd trimester (%)	3rd trimester (%)
200 (91.3)	19 (8.7)



Conclusions

In our cohort amniocentesis has proven to be a safe (no fetal loss was recorded) and reliable diagnostic tool when performed with a correct procedure in a highly experienced center in the management of *Toxoplasma gondii* infections during pregnancy. In our experience, the extremely low prevalence of CT is due to a majority of infections during the 1st trimester, a correct counselling, management and prompt treatment of our patients.

Preliminary data will be further supplemented as we would like to retrieve data regarding the outcomes of newborns we have lost at follow-up.

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