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JOURNAL ARTICLE

Dual energy metabolism-dependent effect of *Ureaplasma urealyticum* infection on sperm activity

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Genital *Ureaplasma urealyticum* infection is considered a sexually transmitted infection. It has long been debated whether the presence of *U. urealyticum* in semen may be a possible cause of infertility.

Long-term incubation (4 hours or overnight) of sperm cells with *U. urealyticum* in vitro resulted in a significant inhibition of sperm motility and membrane alteration whereas a short incubation (45

minutes) of sperm cells with ureaplasmas resulted in an acceleration of sperm velocity. The aim of this study was to understand these contradictory reports of *U. urealyticum* infection on sperm motility. Spermatozoa from fresh ejaculates of normozoospermic semen of men who were referred to the university Male Fertility Laboratory for semen analysis, with no history of genital tract infection, and from normal Assaf breed rams were infected in vitro with *U. urealyticum* serotype 8, at different pHs and O₂ concentrations. Sperm viability and motility and changes in extracellular pH were evaluated. A significant (16%-43%) increase in sperm activity was observed upon infection at alkaline pH (7.8) under aerobic or hypoxic conditions, and a 58% increase was observed under anaerobic conditions and pH 7.2. When the infection was conducted under aerobic conditions and acidic pH (6.3), or under hypoxic conditions at neutral pH (7.2), an 8%-25% inhibition of sperm activity was observed. These results indicate that when sperm activity depends on mitochondrial oxidative phosphorylation, usually at low pHs, *U. urealyticum* competes with mitochondrial energy production and therefore reduces sperm motility and viability. However, when sperm energy metabolism depends on glycolysis, usually at higher pHs, *U. urealyticum* stimulates glycolysis and sperm activity.

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