



RESEARCH ARTICLE

Clinical significance of asymptomatic urogenital *Mycoplasma hominis* and *Ureaplasma urealyticum* in relation to seminal fluid parameters among infertile Jordanian males

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Received 18 June 2009; accepted 29 October 2009

Available online 28 March 2010

KEYWORDS

PCR;
Mycoplasma hominis;
Ureaplasma urealyticum;
Seminal fluid;
Varicocele

Abstract Objectives: To investigate Mycoplasma prevalence rate among infertile Jordanian patients and determine the possible role of asymptomatic *Mycoplasma hominis* and *Ureaplasma urealyticum* as an infectious factor that might affect semen quality in infertility, mainly varicose-related one.

Setting: Medical Hussein City Hospital in Jordan.

Materials and methods: Seminal fluids obtained from 99 infertile patients were tested for the presence of *M. hominis* and *U. urealyticum* by polymerase chain reaction (PCR) and analyzed for motility, counts and viscosity. Cases involved were 33(27.5%) infertile with varicocele, 8(24.2%) with normal seminal fluid parameters, 25(75.8%) with abnormal, and 66(55%) infertile patients (all showed a decrease in sperm concentration and motility). Twenty-one fertile males (17.5%) were used as control. DNA primer pairs specific for 16S ribosomal RNA gene of *M. hominis* and urease gene of *U. urealyticum* were utilized for PCR.

Results: *M. hominis* and *U. urealyticum* were present in 9(27.3%), 4(12.1%) of seminal fluids of infertile-varicose patients, 12(18.2%), 11(16.7%) of infertile and only in 3(14.3%), and 0(0%) fertile male, respectively. The presence of the two species among infertility cases was significantly correlated ($p = 0.039$). A high percentage of *M. hominis* was recorded in varicose-infertile males. *U. urealyticum* was significantly associated with infertility cases (without varicocele) in comparison with control

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($p = 0.046$). It exerts a minor effect on the mean values of sperm motility by decreasing a and b grades' motility.

Conclusion: The differences in the occurrence of *M. hominis* were statistically insignificant among infertility and control groups, but it was significant for *U. urealyticum* ($p = 0.046$). *M. hominis* occurs more frequently in the semen of infertile-varicose male and normal seminal fluid quality. It seems to have no adverse effects on sperm motility but it might decline the fertility potential in such cases. *U. urealyticum* on the other hand have no clear significant impacts on sperm motility. The mean values for sperm motility, concentrations, and viscosity were not affected by the presence of the two species. Despite the significant presence of Ureaplasma among infertility, further studies were needed to clarify their potential effect on semen quality and infertility status.

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1. Introduction

Male factor accounts for up to half of all cases of infertility and affects one man in 20 in the general population (1). Varicocele was considered as one of male infertility causes present in 2–22% of the adult male population (2). In men with abnormal semen analysis, the prevalence of varicocele was about 25% (3). This condition has been linked to a series of biochemical changes in the epididymal fluid and sperm cells, and has a role in affecting sperm motility and morphology which lead to sperm dysfunction (4). It is characterized by the stasis of the internal spermatic vein, leading to elevated scrotal temperature, testicular hypoxia and retrograde blood flow of adrenal and renal metabolites (5). A reduction in the volume of the affected testicle has been detected mostly in such cases which could be restored after surgical treatment with an increase in sperm count and motility rate (6). However, varicocele, especially the high grade one, is not a progressive condition and some patients retain normal semen quality, after certain time (7). Immunologic factors and urogenital Infections appeared to have certain role in varicocele-related infertility (8). Data about their influence on seminal fluid parameters are contradictory, since males with varicocele showed infertility with variable semen finding. Moreover, some varicose male appeared fertile, but their fertility potential might decline gradually (9).

Infections of the male reproductive tract have been recognized to cause chronic damage to the organs where they are lodged and have been considered as one of the causes of male infertility (10,11). Different species of bacteria known to have an impact on spermatogenesis and participating in male infertility were identified. Beside their influence on spermatozoa, infectious mediators that appear to be responsible for specific molecular process in infections particularly affected the motility of the sperm (12). Mycoplasmas (*Mycoplasma hominis* and *Ureaplasma urealyticum*) are the smallest free-living, unusual, bacteria that possess a very small genome, and characterized by their strict dependence on the host for their nutrients. They have the capability to attach to spermatozoa and influence their motility in a negative fashion (13). Mycoplasmas are either commensal with a detectable percentage of 1/25 in healthy control (14) or benign pathogens associated with mild and chronic infections (15). This leads to the suspicion that chronic asymptomatic genital tract colonization with Mycoplasmas might contribute to human infertility. Dieterle, in 2008, found that sperm motility and viability were impaired by symptomatic urogenital infections, while no clear evidence have been reached concerning the adverse effect of asymptomatic

urogenital infection on male infertility (16). However, generations of subclinical genital infection or non gonococcal urethritis have been detected in 25% of infertile men. The most widespread species in the genital tract of both sexes was *U. urealyticum* (17). Its reported prevalence varied from 10% to 40% in the male seminal fluids (18,19) and showed to have a role in varicose-infertile male with higher rate in asthenozoospermia (20). The presence of *U. urealyticum* in the seminal fluid has a direct effect on sperm motility, density and morphology (21,22). Preincubation of spermatozoa with the supernatant of *U. urealyticum* culture decreases the human sperm-hamster egg penetration rate which suggests the presence of toxic factor that impairs sperm function. The extent of penetration inhibition varied considerably among ureaplasma serotypes (23).

The importance of Mycoplasmas is obscured by the presence of many asymptomatic persons from whom *M. hominis* and *U. urealyticum* can be isolated from urogenital specimens. However, there is no clear evidence that asymptomatic urogenital infections with Mycoplasmas have an adverse effect on seminal fluid quality. The amount of data which has been collected to support this concept failed to explain their influence on sperm quality. Studies in the field were hampered by the frequent isolation of ureaplasma from fertile groups (24). De-Jong et al., failed to find a significant difference between ureaplasma isolation rates from the semen of infertile and fertile men (25). It has been proposed that ureaplasma titer of 103 colony-forming units/ml of semen is significant, whereas lower titers are due to contamination by normal urethral colonization (26).

Varicocele and seminal fluid colonization with Mycoplasmas exert an effect on male fertility and semen quality. Mycoplasma infections are known to cause some reproductive problems which mean that chronic asymptomatic genital colonization might have an association with male infertility. In this study, we investigated the prevalence rate of *M. hominis* and *U. urealyticum* among infertile Jordanian patients (with or without varicocele) to determine if there is any role for Mycoplasmas on the semen quality in such cases.

2. Materials and methods

2.1. Study groups

Ninety nine infertile patients (33 with varicocele and 66 without) were enrolled in the study with mean duration of infertility of 3.0167 ± 0.2687 year. The patients were attending infertility department at Medical Hussein City Hospital in

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