Mycoplasma and ureaplasma infection and male infertility: A systematic review and meta-analysis

Huang Chuan1, Zhu Hailun1, Fan Liqing1,2 and Zhu Wenbing1,2

1.Institute of Reproductive & Stem Cell Engineering, Central South University, Changsha 410078, China
2.the Sperm Bank of Reproductive & Genetic Hospital, CITIC-XIANGYA, Changsha, 410078, China

Study question: The goals of this study were to evaluate the association between genital Ureaplasma (U. urealyticum and U. parvum), Mycoplasmas (M. genitalium and M. hominis) and risk of male infertility, and to compare the prevalence of genital Ureaplasma and Mycoplasmas infection in China relative to the world average?

Summary answer: Our analysis supports that U. urealyticum and M. hominis, but not U. parvum and M. genitalium is an etiological agent in male infertility.

What is known already: The correlation between Mycoplasmas, Ureaplasmas infection and male infertility has been studied widely. However, The role that U. urealyticum and M. hominis infections play in male infertility is controversial. Hitherto, M. genitalium and U. parvum have seldom been investigated in infertile men.

Study design, size, duration: There were 14 studies in this research between January 2000 and December 2014. 5 studies with 611 case and 506 controls were concerning U. urealyticum infection. and 9 studies with 2410 cases and 1223 controls were about M. hominis infection. Other two infection(U.parvum and M.genitalium) were studied in 5 and 3 studies, respectively.

Participants/materials, setting, methods: The major criteria were as follows: (a) case-control studies about the associations of genital Ureaplasma or Mycoplasmas with male infertility; (b) the patient group was men who were diagnosed with infertility. The major exclusion criteria were as follows: (a) duplicate data; (b) abstract, comment, review and editorial.

Main results and the role of chance: This meta-analysis indicated that the U. parvum and M. genitalium might be not associated with the risk of male infertility. However, U. urealyticum and M. hominis was significantly associated with increased risk of male infertility[ORs were 3.03 (1.02–8.99) P=0.046; 2.8 (0.93-3.64) P=0.025]. Compared to the world average, a significantly higher positive rate of U. urealyticum was observed in both the infertile and control groups in China. In contrast, a significantly lower positive rate of M. hominis was observed in both the infertile and control groups in China.

Limitations, reasons for caution: First, the sample size was small, which might potentially influence the combined results. Second, other environmental factors, such as smoking and drinking, were not considered in our meta-analysis due to data deficiency. Third, this meta-analysis was conducted based on case-control study that has risk of recall bias.

Wider implications of the findings: More detailed studies of these four species in China and the world could contribute to a better understanding of the epidemiology and pathogenesis, and facilitate the development of better strategies for treatment and prevention of male infertility.

Study funding/competing interest(s): Fundamental Research Funds for the Central Universities of Central South University(2015zzts102).

Trial registration number: None

Key words: Ureaplasma urealyticum; Ureaplasma parvum; Mycoplasma hominis; Mycoplasma genitalium; male infertility

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