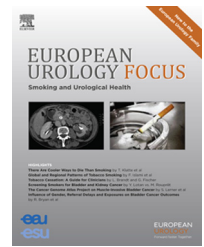


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Review – Andrology

Sexually Transmitted Disease and Male Infertility: A Systematic Review

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Abstract

Context: Theoretically, sexually transmitted diseases (STDs) have the potential to disrupt male fertility; however, the topic remains controversial.

Objective: To describe the possible association between STDs and male infertility and to explore possible pathophysiologic mechanisms.

Evidence acquisition: We performed a systematic literature review in accordance with the PRISMA guidelines. PubMed, Embase, and the Cochrane Library were searched for articles published before January 1, 2016, using the MeSH terms for a variety of STDs and infertility. The search was restricted to human studies performed in men and published in English. Studies were included if they contained original data on a possible association or a cause-and-effect relationship between STD and male infertility. Studies were considered only if they included an appropriate control group and/or comprehensive laboratory data. Due to heterogeneity in the literature, a qualitative analysis was performed.

Evidence synthesis: Relevant studies on *Chlamydia trachomatis*, genital mycoplasmas, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, and viral infections were identified. For all pathogens, the studies were contradictory and generally of limited quality. In studies confirming an association, there was a tendency for authors to perform multiple analyses without appropriate corrections and to subsequently focus solely on outcomes that seemed to suggest a positive association; however, the body of literature that does not confirm an association between STDs and male infertility is also of inadequate quality. The data regarding possible pathophysiologic mechanisms are inconclusive.

Conclusions: There may be an association between STDs and male infertility of unknown genesis and possibly with different pathogenic mechanisms for different pathogens. Alternatively, some STDs may cause male infertility, whereas others may not; however, there is hardly a strong correlation. High-quality studies of the subject are needed.

Patient summary: Sexually transmitted diseases may cause male infertility through unknown mechanisms; however, from the available research, we cannot be sure that there is an association, and more studies are needed.

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1. Introduction

Infertility is defined as the inability of a couple to achieve pregnancy despite unprotected intercourse for a period of >12 mo [1]. Approximately 15% of all couples are infertile, and it is estimated that a male factor plays a role in about half of the cases [2]. The components of male reproductive function include hormonal regulation of the hypothalamic–pituitary–gonadal axis, complete spermatogenesis, and unobstructed normal sperm transport and storage. Theoretically, sexually transmitted diseases (STDs) have the potential to disrupt several of these steps. Nevertheless, the main focus in studied STD-induced infertility tends to be on the female partner. This review aimed to describe the possible association between various STDs and male infertility. In addition, possible mechanisms by which STDs may influence male fertility have been explored and discussed.

2. Evidence acquisition

We performed a systematic literature review in accordance with the PRISMA guidelines. PubMed, Embase, and the Cochrane Library were searched for articles published before January 1, 2016, using the MeSH terms for a variety of STDs and infertility (Fig. 1). The search was restricted to human studies performed in men and published in English. Studies were included if they contained original data on a possible association or a cause-and-effect relationship between STD and male infertility. To reduce bias, studies were considered only if they included an appropriate control group and/or comprehensive laboratory data. Titles and abstracts were screened, and the full text of relevant articles was subsequently reviewed before inclusion. The primary author (M.F.) performed the initial screening, and all authors approved the final selection. Results of the literature search are illustrated in Figure 2. We extracted data regarding the prevalence of relevant STDs, fertility status, and traditional semen parameters as well as any data on seminal functional status or presence of antisperm antibodies. When nothing else was mentioned in the text, *infertility* was defined as the inability to conceive for a period of at least 12 mo, and *fertility* was defined as a history of parenthood and/or a currently pregnant partner. In studies in which participants were reported to have symptomatic urinary tract infections, this detail is specifically mentioned. Due to heterogeneity of

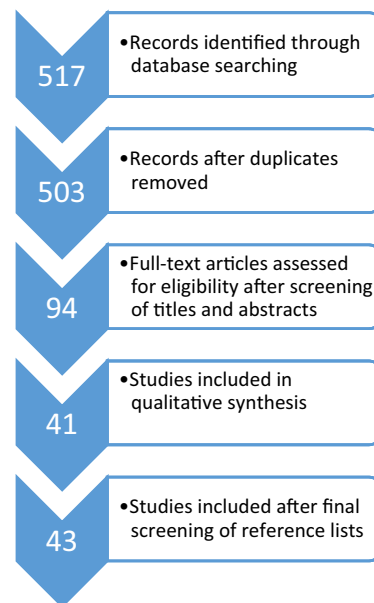


Fig. 2 – Flow diagram illustrating results of the literature search.

the study methods and data, no meta-analyses were performed.

3. Evidence synthesis

Studies investigating STDs and fertility status and/or semen quality are summarized in Tables 1–4 according to pathogenic agents. The studies are further described in the text. Studies investigating possible causative links between STDs and infertility are described in the text only.

3.1. *Chlamydia trachomatis*

3.1.1. *Chlamydia trachomatis*: studies investigating association with infertility

Some studies have indicated that the incidence of chlamydia may be higher in infertile men compared with those with normal fertility. In one such study, serum samples were obtained from men from 52 couples with unexplained infertility and from 72 expectant fathers [3]. Men from the infertile couples were significantly more likely to be seropositive for chlamydia antibodies at a high titer; however, there was no difference between groups in the

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((((((((((("Sexually transmitted diseases"[Mesh]) OR "Chlamydia trachomatis"[Mesh]) OR
"Neisseria gonorrhoeae"[Mesh]) OR "herpes genitalis"[Mesh]) OR "Ureaplasma
urealyticum"[Mesh]) OR "Mycoplasma hominis"[Mesh]) OR "hepatitis B"[Mesh]) OR
"hepatitis C"[Mesh]) OR "HIV"[Mesh]) OR "Treponema pallidum"[Mesh]) OR "herpes
simplex"[Mesh]) OR "cytomegalovirus"[Mesh]) OR "Trichomonaas vaginalis"[Mesh]) AND
"infertility"[Mesh])
```

Fig. 1 – The full search strategy of MeSH terms used for searching PubMed.

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