Study Letters

Increase in prevalence of *Ureaplasma* spp. in patients with genital tract infections in a tertiary care hospital of North India

Sir,

Due to lack of population-based studies and adequate laboratory infrastructure, information regarding the profile of sexually transmitted infections is largely inadequate and relies essentially on hospital-based data in most of the regions. Recent reports suggest declining prevalence of traditional sexually transmitted pathogens, while genital mycoplasma infections are gaining more importance. *Ureaplasma* spp., which are commensals in the genital tract, are now being increasingly recognized as contributors and causative agents for urogenital infection. Recent data from Greece and Turkey have reported higher prevalence of *Ureaplasma* spp. compared to other sexually transmitted infections.[1,2] If left untreated, it may lead to sequelae such as pelvic inflammatory disease, infertility and ectopic pregnancy.[2] However, its role is often underestimated due to the difficulty associated with isolating and identifying it.

A previous study at our centre, in 2014 demonstrated a prevalence rate of 6.1, 15.2 and 5.5% for *C. trachomatis, Ureaplasma* spp. and *Mycoplasma hominis* respectively.[3] The present study was planned to detect the prevalence of these sexually transmitted infective agents in genital specimens of symptomatic patients attending our sexually transmitted disease (STD) clinic and to compare the prevalence of *Ureaplasma* spp. to our previous report and that of the world average. This analysis was intended to determine whether the general rise in trend reported from several countries worldwide represent a similar picture in India.

A retrospective analysis was undertaken for a period of 7 months (January 2017 and July 2017), in which sexually active heterosexual males and females were included belonging to the age group 18–46 years. Samples included endocervical swabs in women and urethral swabs and urine samples in men. Semi-quantitative culture was done in pleuropneumonia-like organism, broth pleuropneumonia-like organism containing urea and arginine for *Ureaplasma* and *M. hominis* respectively. A multiplex polymerase chain reaction targeting the urease gene of *Ureaplasma* spp. and 16Sr DNA of *M. hominis* was performed. A polymerase chain reaction was also performed to detect *Mycoplasma genitalium* by targeting the 140 kDa adhesin gene. *Ureaplasma* isolates were further biotyped based on polymerase chain reaction amplification of multiple banded antigen gene.[4] Laboratory diagnosis of *C. trachomatis* was based on performing a DNA polymerase chain reaction targeting the cryptic plasmid. The prevalences were expressed as proportions (%). Chi-square test was used to compare the prevalences between two time periods. Stata 14.2 was used for statistical analysis.

Among the 221 samples tested, at least 1 pathogen was detected in 38.9% (86) of the samples. The rate of detection of *C. trachomatis*, *Ureaplasma* spp., *M. hominis* and *M. genitalium* was 4.5%(10), 29.0%(64), 5.0%(11) and 0.5%(1), respectively [Table 1]. The overall positive incidence of genital mycoplasmas was 34.4% (76 cases. *Ureaplasma* spp. was detected in 53 (29.0%) samples in which a single pathogen was detected and in 11 (10.4%) samples multiple pathogens were detected. Nearly 13 (12.3%) patients had co-infection with more than one pathogen, amongst which, co-infection with *C. trachomatis* and *Ureaplasma* spp. was predominant. On evaluation of the biovar of *Ureaplasma* spp., it was found that 45 (59.2%) belonged to biovar 2, i.e. *Ureaplasma urealyticum.*

We found no significant differences in prevalence of *C. trachomatis* and *M. hominis* compared to our previous studies (P value = 0.49 and 0.63). However, a significantly higher infection rate by genital mycoplasmas was found in the overall population (P = 0.01). *U. urealyticum* was the most common infective organism in our study. When compared to previous years there is a significant rise in *Ureaplasma* spp. (P = 0.01) and a shift toward biovar 2 (P < 0.01). Mono-infection with ureaplasma was detected in 53 patients (23.9%) with significantly higher rate (P < 0.05) than associated infections 11 (4.9%). Association of *C. trachomatis* with urogenital mycoplasmas was significantly higher (P < 0.01) than other co-infections.

The proportion of patients positive for *U. parvum*/*U. urealyticum* was significantly higher compared to our previous study (29.0% vs 15.2%, P = 0.001) and also for overall mycoplasma infection (35.4% vs 20.7%, P = 0.002). However, the pattern of

Table 1: Comparison of the prevalences of the sexually transmitted infection agents in patients with urethral and endocervical discharge

Infection type	Period		*P*
	January-September, 2014 (%)	January-July, 2017 (%)	
Overall positivity	47/164 (28.7)	86/221 (38.9)	0.04
Genital mycoplasma	37/164 (22.6)	76/221 (34.4)	0.01
Ureaplasma spp.	25/164 (15.2)	64/221 (29.0)	0.06
Mycoplasma hominis	9/164 (5.5)	11/221 (5.0)	
Mycoplasma genitalium	3/164 (1.8)	1/221 (0.5)	
Chlamydia trachomatis	10/164 (6.1)	10/221 (4.5)	0.49

infection remains the same. Our results are consistent with other studies from various parts of the world.[1,2,5] Regarding increased prevalence of co-infection with *C. trachomatis* and *Ureaplasma* spp., recent studies have demonstrated certain survival advantages for *C. trachomatis* probably through direct or indirect supply of tryptophan to overcome its intracellular depletion by interferon γ exposure, although the exact mechanism remains obscure.[6] Compared to our previous studies, which had only biovar 1 isolates, our present study showed a predominant shifting trend towards biovar 2. U. urealyticum (biovar 2) is more significantly associated with nongonococcal urethritis. U. parvum is more commonly found in asymptomatic healthy subjects.

Limitations of our study include its retrospective design and collection of data from a single center only. Also, we were unable to perform antimicrobial susceptibility testing of the Ureaplasma isolates due to financial constraints.

To conclude, this initial data mirrors the upward trend of genital mycoplasma infections, asbeing observed worldwide. Our analysis supports the increasing prevalence of genital mycoplasmas, especially *Ureaplasma* spp. as etiologic agents in patients with genital tract diseases. More detailed studies in India could contribute to a better understanding of the epidemiology and pathogenesis and facilitate the development of better strategies for their treatment and prevention.

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Conflicts of interest
There are no conflicts of interest.

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