

Isolation of *Ureaplasma urealyticum* and *Mycoplasma hominis* from Patients with Genitourinary Tract Infection^{*}

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ABSTRACT

The isolation rate of *Ureaplasma urealyticum* in males was 45.3% in patients with urethritis, 43.9% with prostatitis, and 37.5% with cystitis, respectively. These values were significantly high compared with the rate of 28.8% in healthy control. The incidence of this organism in females was generally higher than that in males. It was 57.4% in patients with vaginitis, 47.8% with other genitourinary diseases, 51.6% in pregnant women, and 34.0% in healthy control. In prostitutes, the rate was as high as 77.6%. The isolation rate of *Mycoplasma hominis* was relatively low in both sexes, and no clear difference was observed between the patients and healthy controls. However, the rate was extremely high in prostitutes, amounting to 79.1%.

INTRODUCTION

Since the discovery of *Ureaplasma urealyticum* in human²³⁾, the etiological role of this microbe to urogenital tract infections has been investigated by many research workers^{2, 3, 6, 16, 30, 31)}. Although the role has not yet been worked out, recent studies have proposed a concept that *U. urealyticum* is one of the etiological agents for reproductive failure^{11, 29)} and infertility^{1, 32)}, and for such infections of human urogenital tract as nongonococcal urethritis^{5, 16, 28)}, placentitis⁸⁾, chorioamnionitis^{21, 27)}, and intrauterine infection⁷⁾.

Mycoplasma hominis has also been frequently found in female urogenital tract^{9, 15)}, although it is difficult to determine its pathogenicity. Mårdh and Weström¹⁷⁾ succeeded in isolating

M. hominis in pure culture from fallopian tubes. Serologic evidence for the presence of *M. hominis* and its possible association with pyrexia and signs of genital tract infection has been described^{12, 18)}. The organism was isolated from amniotic fluid of amnionitis⁴⁾.

Tully and his coworkers³³⁾ suggest that *U. urealyticum* and *M. hominis* might be etiologically associated with the relatively common nonspecific postpartum fever.

The present paper describes the occurrence of *U. urealyticum* and *M. hominis* in the urogenital tract of persons living in Daejeon, Korea.

MATERIALS AND METHODS

Specimen. Male urine specimens were collected as clean voided midstream in sterilized

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bottles from 90 healthy adults, 97 patients with urethritis, 66 with prostatitis, and 48 with cystitis. Cervical swab specimens were obtained from 97 healthy adult females, 54 patients with vaginitis, 23 with the other urogenital diseases, 62 women of pregnancy, and 67 prostitutes. The swabs were soaked in 2 ml of the liquid medium described below. All the specimens were immediately delivered to the laboratory and processed within 2 hr of sampling.

Medium. Standard liquid medium 10-B was prepared according to Shepard and Lunceford²⁰. A 2-ml portion of the medium was aseptically distributed into screwcapped tubes and stored at -20°C . Differential agar medium A7 was formulated as described by Shepard and Lunceford²⁵. The agar plates were stored in a refrigerator at 4°C .

Cultivation and identification. The specimens were serially 10-fold diluted in 2 ml of the

liquid medium, incubated at 37°C , and inspected daily for 7 days. When a color change to red was observed, a 0.1-ml of the culture was inoculated onto the differential agar plate and incubated for 2 days in a Gas-Pak system. The plate with ureaplasma growth, as observed under 100-fold magnification, was tested by the direct urease test by Shepard²⁴. *M. hominis* was identified with the large colony without color change by the urease test.

RESULTS

The occurrence of *U. urealyticum* and *M. hominis* in the specimens is summarized in Tables 1 and 2. The isolation rate of *U. urealyticum* was 45.3, 43.9, and 37.5% in the patients with urethritis, prostatitis, and cystitis, and 28.8% in healthy male control, respectively. In females, it was 57.4, 47.8, 51.6, 77.6, and 34.0% in the group of vaginitis, the other

Table 1. Isolation of *Ureaplasma urealyticum* and *Mycoplasma hominis* from urine of male subject

Subject	No. of case	<i>Ureaplasma</i> only (%)	<i>Mycoplasma</i> only (%)	<i>Ureaplasma</i> + <i>Mycoplasma</i>	Total	
					<i>Ureaplasma</i>	<i>Mycoplasma</i>
Urethritis	97	39(40.7)	3(3.1)	5(5.2)	44(45.3)	8(8.2)
Prostatitis	66	25(37.8)	3(4.5)	4(6.1)	29(43.9)	7(10.6)
Cystitis	48	16(33.3)	1(2.0)	2(4.2)	18(37.5)	3(6.3)
Total of patient	211	80(37.9)*	7(3.3)	11(5.2)	91(43.1)*	18(8.5)
Healthy control	90	23(25.5)	2(2.2)	3(3.3)	26(28.8)	5(5.6)

* $p < 0.05$ compared with healthy control

Table 2. Isolation of *Ureaplasma urealyticum* and *Mycoplasma hominis* from vaginal swab

Subject	No. of case	<i>Ureaplasma</i> only (%)	<i>Mycoplasma</i> only (%)	<i>Ureaplasma</i> + <i>Mycoplasma</i>	Total	
					<i>Ureaplasma</i>	<i>Mycoplasma</i>
Vaginitis	54	26(48.1)	3(5.5)	5(9.3)	31(57.4)	8(14.8)
Others	23	9(39.1)	1(4.3)	2(8.7)	11(47.8)	3(13.0)
Total of patient	77	35(45.4)*	4(5.2)	7(9.1)	42(54.5)*	11(14.2)
Pregnancy	62	28(45.1)	1(1.6)	4(6.4)	32(51.6)	5(8.0)
Prostitute	67	3(4.5)	4(5.9)	49(73.1)**	52(77.6)**	53(79.1)**
Healthy control	97	28(28.9)	4(4.1)	5(5.2)	33(34.0)	9(9.3)

* $p < 0.05$ and ** $p < 0.01$ compared with healthy control

urogenital diseases, pregnancy, prostitutes, and healthy adults, respectively. The isolation rate averaged 43.1% with the male patients and 54.5% with the female patients. Both the rates were significantly higher than those of healthy controls ($p < 0.05$).

The incidence of *M. hominis* averaged 8.5% with the male patients which was almost the same as that with healthy control. In females, the incidence averaged 14.2% with the patients, 8.0% with pregnancy, 79.1% with prostitutes, and 9.3% with healthy persons.

The isolation of both the organisms was extremely high in prostitutes compared with the other female groups.

DISCUSSION

The isolation rate of *U. urealyticum* in male patients with urogenital tract infection was lower in the present study than those reported previously by Piot²³ (40 to 57%), Markham et al.²¹ (76%), and Jansson and associates¹¹ (58%). The incidence of this organism in female patients was also lower than in the reports by Kundsinn¹³ (80%) and Markham et al.²⁰ (60 to 85%), but it was almost the same as that by Mårdh and Weström¹⁹ (55.4%). Mårdh and Weström¹⁹ reported the highest incidence of the organism in pregnancy to be as high as 68.4% and assumed that local changes accompanying pregnancy might offer favorable environment for the growth of the organism. In the present study, however, the incidence of this microbe in pregnancy was not higher than the other female groups except the prostitutes. The incidence of the organism in prostitutes was comparable with those of earlier reports. The isolation rate was consistently higher in females than in males. McCormack and his coworkers¹¹ reported that *U. urealyticum* was acquired through sexual contact and was a part of vaginal flora of healthy sexually active women.

The isolation rate of *M. hominis* in the present study was also lower than in the reports by earlier investigators, but the incidence in prostitutes was rather higher.

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