

## ISOLATION OF *UREAPLASMA UREALYTICUM* FROM UROLOGICAL OUT PATIENTS

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*Ureaplasma urealyticum* was isolated in 25.5% of the patients with urethritis and in 12.9% of the patients with prostatitis. The organism was isolated more frequently in non-gonococcal urethritis than in gonorrhoeal urethritis. It may thus be said that the isolation rate was higher among patients with overt signs or symptoms as compared with the common isolation rate in urine reportedly being about 10%.

**Key words:** *Ureaplasma urealyticum*, NGU, STD, Prostatitis

*Ureaplasma urealyticum* is frequently demonstrated in the urine of man and in the semen as well, but much remains unclear as to its pathogenicity<sup>1-4</sup>). We isolated *U. urealyticum* chiefly from urine of male patients, with comments on clinical manifestations of infection by this organism and on its pathogenicity.

### MATERIALS AND METHODS

The subjects studied were male patients who had experienced sexual intercourse and who were outpatients at the Department of Urology, Tokai University Hospital, Isehara, Japan, during the recent four years. Most of these patients had urethritis and/or prostatitis, or male sterility. Also included were those who attended the clinic for examination for venereal disease though without symptoms.

Bacteriological examination was performed by the Taylor-Robinson test<sup>5</sup>). As the test is based on the principle of colour reaction for enzymatic urea decomposition, urine may show a false positive test if it contains bacteria capable of urea breakdown. In the present study, therefore, portions of urine samples were cultured and patients whose urine cultures showed a growth of urease-producing bacteria were excluded from the study.

The laboratory test of urine was per-

formed on 518 patients, on a total of 970 occasions because of repeated tests, post-treatment retesting and collection of two or more different types of specimens from the same patient. No females were included in the present series.

### RESULTS

Table 1 summarizes the statistical data concerning Taylor-Robinson tests of urine and other clinical specimens<sup>6</sup>). Tests of samples of urine voided after prostate massage were included among the 780 urine specimens examined of the 4 samples classified under "other", two were effusions from hydrocele testis, one was urethral discharge, and the other one, pus from chronic epididymitis<sup>7</sup>). Table 2 shows the *U. urealyticum* isolation rates according to clinical entity. Most of the cases classified under "others" were of male infertility.

### DISCUSSION

These high rates of isolation of *U. urealyticum* from the male urethra eventually implies a great probability of its being sexually transmitted disease (STD) and a high likelihood that the organism causes ascending urinary tract infection<sup>7-10</sup>) with consequent deterioration of the characteristics of semen, thereby giving rise to male

Table 1. Isolation of *U. urealyticum* from the different specimen of patients with STD or related disease.

Specimen	No. of specimens	U. urealyticum .....positive	
		No.	%
Urine	874	144	16.5
Semen	92	12	13.0
Others	4	2	50.0
Total	970	158	16.3

Table 2. Isolation of *U. urealyticum* from the urine of patient with STD and related disease.

Diagnosis	No. of patient	U. urealyticum .....positive	
		No.	%
Urethritis	294	75	25.5
Prostatitis	138	18	12.9
Others	85	21	24.7
Total	517	114	22.0

sterility<sup>11,12</sup>). Thus the organism would have to be eradicated. Therapeutic responses of the patients treated will be reported elsewhere, tetracyclines and erythromycins have been described to be usually effective against *U. urealyticum* and, in fact, we observed satisfactory therapeutic responses in patients given these antibiotics<sup>13-17</sup>).

Concurrence of *U. urealyticum* with *Chlamydia trachomatis* or *Trichomonas vaginalis* has often been documented in the literature<sup>12,17-21</sup>). These organisms are all transmissible by sexual intercourse and, therefore, it is natural that they coexist in certain milieus. However, it appears very unlikely that they mutually influence each other. Changes in pH and promotion of the growth of other organisms by metabolites in culture may occur, but it seems improbable that such interrelations take place *in vivo*.

There was no clinical evidence of inflammation in virtually any *U. urealyticum* positive case<sup>11,22-24</sup>). This would suggest that the organism is not pathogenic at least for urethritis. The possibility that the organism harbours specifically in the prostate or is causative of prostatitis seems to be ruled out, since it was isolated from urine after prostatic massage as frequently as or less frequently than from spontane-

ously voided urine. In *T. vaginalis* infection, for example, trichomonads are detected in post-prostatic massage urine with a significantly higher frequency than in spontaneously voided urine and that the urine often presents findings indicative of inflammatory reactions<sup>25</sup>).

In women, discharges from the uterine cervix have usually been subjected to detection of *U. urealyticum* whereas urine specimens have not been used. The influence of the organism on the female urinary tract remains unknown.

### REFERENCES

- 1) Schepard MC: Nongonococcal urethritis associated with human strains of "T" mycoplasmas. JAMA 211: 1335-1340, 1970
- 2) Bennett AH, Kundsinn RB and Shapiro SR: T-strain mycoplasmas, the etiologic agent of non-specific urethritis; A venereal disease. J Urol 109: 427-429, 1973
- 3) Klousia JM, Madden DL, Fucillo DA, Traub RG, Mattson JM and Krelewicz AG: The etiology of non-specific urethritis in active duty marines. J Urol 120: 67-70, 1978
- 4) Oriol JD: Role of genital mycoplasmas in nongonococcal urethritis and prostatitis. STD 10-S: 263-270, 1983
- 5) Taylor-Robinson D, Evans RT, Coufalik ED, Prentice MJ, Munday PE, Csonka GW and Oates JK: *Ureaplasma urealyticum* and *Mycoplasma hominis* in chlamydial and non-chlamydial nongonococcal urethritis. Br J Vener Dis 55: 30-35, 1979
- 6) Shiramizu M, Kawashima T, Kawamura N and Ohkoshi M: Detection of *Ureaplasma urealyticum* from urine specimen. Jpn J Clin Urol 36: 647-649, 1982
- 7) Toth A, Swenson CE and O'Leary WM: Light microscopy as an aid in predicting urealyticum infection in human semen. Fertil Steril 30: 586-591, 1978
- 8) Friedlander AM and Braude AI: Production of bladder stones by human T mycoplasmas. Nature 247: 67-68, 1974
- 9) Scott D and Francke E: Cystitis with ureteral reflux caused by *Ureaplasma urealyticum*. Urology 25: 171-173, 1985
- 10) Grenado L, Claes G, Hedelin H and Pettersson S: Rapidly recurrent renal calculi caused by *Ureaplasma urealyticum*. J Urol 135: 995-997, 1986
- 11) Weidner W, Krause W, Schiefer HG, Brunner HG and Friedrich HG: *Ureaplas*

- mal infections of the male urogenital tract in particular prostatitis, and semen quality. *Urol Int* **40**: 5-9, 1985
- 12) Shalhoub D, Abdel-Latif AF, Fredericks CM, Mathur S and Rust PF: Physiological integrity of human sperm in the presence of *Ureaplasma urealyticum*. *Arch Androl* **16**: 75-80, 1986
  - 13) Prentice MJ, Taylor-Robinson D and Csonka GW: Non-specific urethritis; a placebo-controlled trial of minocycline in conjunction with laboratory investigations. *Br J Vener Dis* **52**: 269-275, 1976
  - 14) Matheus CD, Clapp KH, Tansing JA and Cox LW: T-mycoplasma genital infection: The effect of doxycycline therapy on human unexplained infertility. *Fertil Steril* **30**: 98-99, 1978
  - 15) Blenk H: Diagnostik und Therapie der nicht-gonorrhoeischen Genitalinfektionen. *Urologe B* **19**: 278-285, 1979
  - 16) Toth A and Lesser ML: *Ureaplasma urealyticum* and infertility; the effect of different antibiotic regimens on the semen quality. *J Urol* **128**: 705-707, 1982
  - 17) Aznar J, Caballero MC, Lozano MC, de Miguel C, Palmares JC and Perea EJ: Activities of new quinoline derivatives against pathogens. *Antimicrob Agents Chemother* **27**: 76-78, 1985
  - 18) Kawamura N, Hoshino H and Nakajima N: Clinical trials on minocycline in urinary tract infection of *Ureaplasma urealyticum* *Prog Med* **4**: 1123-1126, 1984
  - 19) Bowie WR, Wang SP, Alexander E, Floyd J, Forsyth P S, Pollock MM, Lin J-SL, Buchanan TM and Holmes KK: Studies on the role of *Ureaplasma urealyticum* and *Mycoplasma hominis* in prostatitis. *J Clin Invest* **59**: 735-742, 1977
  - 20) Brunner H, Weidner W and Schiefer H-G: Studies on the role of *Ureaplasma urealyticum* and *Mycoplasma hominis* in prostatitis. *J Infect Dis* **147**: 807-813, 1983
  - 21) Alfa MJ and Robertson JA: The co-existence of genital mycoplasmas and *Neisseria gonorrhoeae* isolated from the male urethra. *STD* **11**: 131-136, 1984
  - 22) Traub RG, Madden DL, Fuccillo DA and McLean TW: The male as a reservoir of infection with cytomegalovirus, herpes and mycoplasma. *New Engl J Med* **289**: 697-698, 1973
  - 23) Viarengo JJ, Herbrant Fand Piot P: *Ureaplasma urealyticum* in the urethra of healthy men. *Brit J Vener Dis* **56**: 169-172, 1980
  - 24) Meseguer MA, Martinez-Ferrer M, de Rafael L and Baquero GF: Differential counts of *Ureaplasma urealyticum* in male urologic patients. *J Infect Dis* **149**: 657-658, 1984
  - 25) Kawamura N: Studies on *Trichomonas vaginalis* in urological field. *Jpn J Urol* **60**: 15-24, 1969

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## 和文抄録

### われわれの *Ureaplasma urealyticum* 検出率について

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東海大学病院における *Ureaplasma urealyticum* の検出率を検討した。尿道炎から25.5%, 前立腺炎から12.9%の検出率であった。非淋菌性尿道炎からの検出率が淋菌性尿道炎からのそれより高かった。通常, 尿

からの検出率は10%位といわれているので, 症状のある患者からはこのようにやや高率に見出されるのであろう。

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