

## Prevalence of *Trichomonas vaginalis* in Korean military Personnel\*

Chong Yoon Joo and Dong Wik Choi

Department of Parasitology, Kyungpook National University School of Medicine, Taegu, Korea

### INTRODUCTION

Since Donne's description of the *Trichomonas vaginalis* in 1836, the reports of numerous observers have emphasized its very frequent occurrence in women and its being a cause of purulent vaginal discharge of women with severe vaginitis.

Epidemiological, clinical, and therapeutic studies of *T. vaginalis* among pregnant and non-pregnant women in Korea have been reported by many investigators (Song, 1956; Shin and Kim, 1957; Kim, 1962; Chae, 1965; Kim *et al.*, 1969; Chung *et al.*, 1969; Chang and Choi, 1976), but only few studies of this parasite in men have been published (Chu *et al.*, 1974; Kim, 1977).

Chu and co-workers (1974) made a survey of trichomoniasis among in- and out-patients in Kyunghee University Hospital, using urine wet smears, and reported that the incidence of *T. vaginalis* was found to be high, and that the men with trichomoniasis usually presented no symptom or physical sign. Recently, Kim (1977) in his observations on the *T. vaginalis* in men with some noticeable symptoms in lower urinary tract, found a high incidence. However, the incidence of the trichomoniasis in

military personnel was unknown. It was therefore considered worthwhile to study the frequency of occurrence of *T. vaginalis* among the personnel.

The present study attempts to determine the prevalence of *T. vaginalis* in asymptomatic military personnel and obtain information concerning the prevention and eradication of trichomoniasis.

### MATERIALS AND METHODS

This study was conducted in the Department of Parasitology, Korean Army Medical General Laboratory during a period from May, 1975 to October, 1977. In the in- and outpatients clinics of the Army General Hospital, nine hundred and seventy seven patients without any noticeable symptoms in the genitourinary tract, were examined.

#### Urine wet smear:

Specimens of urine were collected in sterilized bottles, and of each specimen, 10ml was centrifuged for 5 minutes at 3,000 revolutions per minute. The supernatant fluid was discarded except for about 0.5 ml in which deposit was suspended. The deposit was put on the culture-microslide, and examined microscopically for *T. vaginalis* by observation of the characteristic motility. Most of the specimens were examined immediately upon collection, the others within two hours.

\* The results of this study were presented at the 1977 annual meeting of the Korean Society for Parasitology.

### Prostate secretion culture:

Samples of prostate secretion were collected by doctors and examined by a trained laboratory assistant. In doubtful cases the results of the examination were rechecked.

Urinary sediments after prostate massage were immediately used to inoculate a culture by rinsing it in a tube of Roiron-Rattner medium (1957/8). The approximate amount of inoculated culture was taken to the parasitology laboratory and placed in the 37°C incubator for 3 to 5 days, and then examined once or twice at 24 hour-interval after inoculation. A drop of the sediment in the bottom of the culture was placed on a slide glass without cover slip and examined in the same manner as a wet smear.

The medium used in this study has been described briefly by Roiron-Rattner, and it was supposed to be most suitable for cultivation of *T. vaginalis* from the genito-urinary tract of the male.

It is composed of: 20 gm pepton, 1 gm asparagin, 5 gm glucose, 10 ml liver extract, 490ml meat extract, 2 gm sodium phosphate dibasic, 2.5gm sodium phosphate dibasic, 2.5gm sodium chloride, 1gm ascorbic acid and 500ml distilled water.

After dissolving and mixing all the above ingredients, it is adjusted to pH 6.0 and the stock medium dispensed in 5ml aliquots into test-tubes(15×150mm), which are then autoclaved. Just before it is used, it is mixed with 1ml inactivated horse serum and standard doses of penicillin and streptomycin.

## RESULTS

Table 1 gives the numbers and percentages of incidence for *T. vaginalis* in the various age groups. The overall infection rate for *T. vaginalis* in 977 cases was found to be 3.4 per cent. The pattern of the infection rates by

age group was appreciably varied; 2.1 per cent in the 20-24 year age group and 5.1 per cent in the 25-29 age group. The rate subsequently increased and reached a maximum, 5.7 per cent in the 40 and over age group. There was no case under the age of 19 years.

**Table 1.** Prevalence of *Trichomonas vaginalis* among Korean military personnel (1977)

| Age group (year) | Number examined | Number infected | Per cent positive |
|------------------|-----------------|-----------------|-------------------|
| 15~19            | 29              | 0               | 0                 |
| 20~24            | 516             | 11              | 2.1               |
| 25~29            | 237             | 12              | 5.1               |
| 30~34            | 77              | 4               | 5.2               |
| 35~39            | 48              | 2               | 4.2               |
| 40~              | 70              | 4               | 5.7               |
| Total            | 977             | 33              | 3.4               |

The comparison of results of *T. vaginalis* by means of the culture and wet smear is shown in Table 2. Demonstration of trichomonads by prostate culture was 3.1 per cent, and by urine wet smear 2.6 per cent. These data indicate that the prostate culture method, in male trichomoniasis, is more likely to give a positive result than the urine wet smear.

**Table 2.** Comparison of detecting rate for *Trichomonas vaginalis* by means of prostatic secretion culture technique and urine wet smears (1977)

| Method                     | Number tested | Number positive | Per cent positive |
|----------------------------|---------------|-----------------|-------------------|
| Prostate secretion culture | 977           | 31              | 3.1               |
| Urine wet smear            | 977           | 25              | 2.6               |

In Table 3, the distribution of *Trichomonas* positive cases in military personnel is listed. 23 cases(69.7 per cent) were positive in both prostate culture and urine wet smear, 8 cases positive by culture but negative by wet smear, and 2 cases were positive only by wet smears.

**Table 3.** Distribution of 33 *Trichomonas vaginalis* positive cases in prostate culture and urine wet smear (1977)

| Results   | No. case | % to total |
|---|----------|------------|
| Positive only in prostate culture                     | 8        | 24.2       |
| Positive only in urine wet smear                      | 2        | 6.1        |
| Positive both in prostate culture and urine wet smear | 23       | 69.7       |

## DISCUSSION

The epidemiological, clinical, and therapeutic studies on the subject of *T. vaginalis* have been carried out by many investigators since Donne's description on this flagellate in 1836.

As shown in Table 4, the incidence of *T. vaginalis* in males shows a wide variation. This may be due to technical difficulties in securing adequate specimens for demonstration of this parasite.

In military personnel, the overall infection rate was found to be 3.4 per cent. The results obtained in the present study generally provide uncontested evidence that the incidence of trichomoniasis in Korean males was high, and confirm the view that *T. vaginalis* represented a public health problem of considerable magnitude in men.

In earlier studies on *T. vaginalis* among the male population, Drummond(1936) reported that from the prostates of husbands whose wives were suffering from *Trichomonas* vaginitis could be cultivated the *Trichomonas* trophozoites, and he reached the conclusion that the males infected with trichomoniasis usually presented no symptoms or physical signs.

A study of Liston and Lees(1940) reported that approximately 16.0 per cent of males suffering from non-gonorrheal urethritis were cases of *T. vaginalis* infection and claimed that this flagellate microorganism infection in males was generally a trivial disease and in some instances would pass unnoticed.

Feo(1944) conducted a study of trichomoniasis in males, using urine wet smears, and reported that the infection rate of this flagellate was found to be 15.5 per cent and that the important transmitter of *T. vaginalis* was male. Similar results in males have been obtained by Whittington(1951) and Iridoya(1959).

In the present study there is a total of 33 cases harboring *T. vaginalis* in 977 specimens examined (3.4%). The results in this study are similar to those reported by Ohmura(1960) 4.4 per cent in Japanese. However, it is different from those reported by Feo(1944) in the United States, by Block(1959) in Sweden, and

**Table 4.** The reported incidence of *Trichomonas vaginalis* in males

| Reporters                | No. tested | Incidence(%) | Materials and Methods                              |
|--------------------------|------------|--------------|--|
| Nitschke(1936)           | 40         | 12.5         | Urine wet smear in NGU* cases                      |
| Liston & Lees(1940)      | 400        | 16.0         | Urine wet smear in NGU cases                       |
| Feo(1944)                | 926        | 15.5         | Urine wet smear in NGU cases                       |
| Whittington(1951)        | 326        | 15.3         | Urine wet smear in NGU cases                       |
| Kostic(1958)             | 98         | 6.1          | Prostatic secretion                                |
| Iridoya(1959)            | 126        | 12.6         | Urine wet smear in NGU cases                       |
| Ohmura(1960)             | 609        | 4.4          | Wet smear in semen                                 |
| Chu <i>et al.</i> (1974) | 9,617      | 0.5          | Wet smear in urine                                 |
| Authors(1977)            | 977        | 3.4          | Urine wet smear and culture in prostatic secretion |

\*NGU: Non-gonorrheal urethritis

Iridoya(1959) in Japan.

The main factors contributing to the incidence for male trichomoniasis were considered to be firstly, lack of understanding and inadequate education in regard to transmission of *Trichomonas* infection, secondly, difficulties in eradication of prostatic infection of this microorganism, and absence of any specific remedy and thirdly, lack of concern in prevention of *T. vaginalis* infection.

The pattern of the infection rates by age groups showed the highest infection in the 40 and over age group, and no case under the age of 19 years. This is corroborated in other studies such as those of Chu and co-workers(1974), who noted that out of 47 positive cases, 28 were in the 40 and over age group. The reasons for the high rate in the 40 and over age group, and the absence of any case of trichomoniasis under the age of 19 years are not readily apparent.

In general, it is known that *Trichomonas* infections can be spread by sexual intercourse, and some authors believe that trichomoniasis should be regarded as a venereal disease.

In the the present survey, upon questioning the *Trichomonas* positive cases, the majority of them have had sexual intercourse with local prostitutes several times a year, with no concern for the prevention and treatment of trichomoniasis.

The frequency of *Trichomonas* infections in the male partner of women with trichomoniasis reported in literature varies from 12.5 to 61.5 per cent(Drummond, 1936; Iridoya, 1959; Block, 1959).

The results presented in Table 2 and 3 indicate that although the prostatic secretion culture and urine wet smear methods in male trichomoniasis give a fairly accurate estimation of the presence of *T. vaginalis*, the former provides us with by far the most accurate method of detecting the presence of this parasite.

It is found that *T. vaginalis* in military personnel is one of the important parasitic disease with a high incidence, and clearly emphasized the fact that the prevention of this disease is possible with extensive public health education and the administration of specific therapeutic agents to patients with trichomoniasis.

## SUMMARY

A study of *Trichomonas vaginalis* in Korean military personnel, based on the discovery of motile trophozoites by prostate culture and urine wet smear methods, has been carried out during the period from May, 1975 to October, 1977.

In the Army General Hospital clinics, specimens of prostatic secretion and urine were provided by the in- and out-patients without any noticeable genito-urinary symptoms.

In a total of 977 specimens 33 cases were revealed positive for *Trichomonas vaginalis*. Of these, 23 cases were positive in both prostate culture and urine wet smear methods, 8 positive in the culture but negative in the wet smear, and 2 positive only in the wet smear.

In comparing the demonstration rates for trichomonads by culture with those by smears, the former was more likely to give a positive result than the latter.

The pattern of the incidence rate by age group was appreciably varied; 2.1 per cent in the 20-24 age group and 5.1 per cent from 25 to 29 and subsequently increased and reached a maximum of 5.7 per cent in the 40 and over age group.

It was found that *Trichomonas vaginalis* in Korean military personnel is one of the important diseases with a high incidence, and that the eradication of this disease is possible with extensive public health education and the administration of specific therapeutic agents to patients with trichomoniasis.



## LITERATURE CITED

- Block, E.(1959) Occurrence of *Trichomonas* in sexual partners of women with trichomoniasis. *Acta Obst. et Gynec. Scand.*, 38:398-403.
- Chae, F.J.(1965) Investigation of *Trichomonas vaginalis*(in Korean, English summary). *Korean J. Obst. & Gynec.*, 8:153-155.
- Chang, S.S., and Choi, D.W.(1976) Demonstration of *Trichomonas vaginalis* in Taegu, Korea. *Kyung-pook Univ. Med. J.*, 17:76-81.
- Chu, J.K., Chang, M.C., Chung, S.B. and Cho, M.J. (1974) Urinary tract infection with *Trichomonas vaginalis* in men (in Korean, English summary). *Korean Centr. J. Med.*, 26:325-330.
- Chung, P.R., Lee, J.H. and Lee, J.H.(1969) Prevalence of *Trichomonas vaginalis* and *Candida* in vagina of the prostitutes at Yosu and Kunsan(in Korean, Abstract). *Korean J. Parasit.*, 7:84.
- Drummond, A.D.(1936) *Trichomonas* infestation of prostate gland. *Am. J. Surg.*, 31:98-103.
- Feo, L.G.(1944) The incidence and significance of *Trichomonas vaginalis* infestation in the male. *Am. J. Trop. Med.*, 24:195-198.
- Iridoya, A.(1959) Studies on *Trichomonas vaginalis* infection(in Japanese, English summary). *Cited by Ohmura, K., Jap. J. Parasit.*, 9:510-514, 1960.
- Kim, I.S., Chung, J.K. and Rim, H.J.(1969) Study on the status of *Trichomonas vaginalis* among Korean females. *Korean J. Parasit.*, 7(2):83-84 (Korean Abstract).
- Kim, S.G.(1977) Observation on trichomoniasis in the lower urinary tract in the male *Korean J. Urol.*, 18:41-46 (in Korean, English summary).
- Kim, Y.C.(1962) Incidence of *Trichomonas vaginalis* and *Candida* in vagina of women, using saline-glucose diagnostic medium *Korean J. Obst. & Gynec.*, 5:203-208 (in Korean, English summary).
- Liston, W.C., and Lees, R.(1940) *Trichomonas vaginalis* infestation in male subjects. *Brit. J. Vener. Dis.*, 16:34-55.
- Nitschke, P.H.(1936) *Trichomonas vaginalis* infection in the male. *J.A.M.A.*, 107:12-14.
- Ohmura, K.(1960) Studies on the *Trichomonas vaginalis* infection in male genito-urinal tracts *Jap. J. Parasit.*, 9:510-514 (in Japanese, English summary).
- Roiron-Rattner, V. (1957/8). "Infestation a *Trichomonas*"(Reim), 244-252.
- Shin, H.S., and Kim, Y.C.(1957). Clinical observations on *Trichomonas vaginalis*, vaginitis among Korean women *Korean Mod. Med. J.*, 2:282-283 (in Korean, Abstract).
- Song, M.D.(1956) A study of vaginal *Trichomonas* among Korean women *J. Obst. & Gynec. of Sudo Med. College.*, 1:3-10 (in Korean, English summary).
- Whittington, M.J.(1951) The incidence of *Trichomonas vaginalis* in a sample of the general population. *J. Obst. Gynec. Brit. Empire*, 58:398-405.

= 國文抄錄 =

國軍 將兵들에서의 질트리코모나스 有病率

慶北大學校 醫科大學 寄生蟲學教室

朱 鍾 潤・崔 東 翊

國軍 將兵들에서의 질트리코모나스의 感染率을 알기 위해 1975年 5월부터 1977年 10月까지 國軍病院 外來 및 入院患者를 調査對象으로 選定하여 小便塗抹檢査와 前立腺 分泌液을 Roiron Rattner 培養液에 培養하여 調査하였다.

總 被檢者 977名中 질트리코모나스陽性率은 3.4%였으며, 感染者中 23名에서는 培養法과 塗抹法으로 本蟲을 모두 檢出할 수 있었으며, 8名에서는 培養法으로는 檢出되었는데 塗抹法으로는 檢出할 수 없었으며, 2名에서는 塗抹法으로만 檢出되었다.

年齡群別 感染率에 있어서는, 20~24歲群에서는 2.1%, 25~29歲群에서는 5.1%였으며, 年齡이 많아질수록 그 率도 增加하여 40歲 以上 年齡群에서는 最高值 5.7%를 나타내었다.

以上の 成績으로 미루어 보아 國軍將兵들에서 질트리코모나스는 感染率이 높은 原蟲類 疾病임을 알았다.