el Seoud F., M. M. Abbas, et al. (1998). “Study of trichomoniasis among Egyptian male patients.” J Egypt Soc Parasitol **28**(1): 263-70.

> In the present study, Trichomonas vaginalis was diagnosed in 28.8% male patients with urethral discharge and in 8.2% suffering from impotence and infertility. Diagnosis was based on examination of urethral discharge, urine, semen and prostatic massage fluid by wet mount, stained films and culture inoculation. Diamond's culture proved to be the method of choice.

el-Sharkawy, I. M., S. M. Hamza, et al. (2000). “Correlation between trichomoniasis vaginalis and female infertility.” J Egypt Soc Parasitol **30**(1): 287-94.

> Trichomoniasis vaginalis is one of the common parasitic infection in females. The present results showed that infertile women with T. vaginalis with or without pathogenic microorganisms have decreased C3 & C4, increased IgA level in vaginal discharge and increased serum prolactin. So. T. vaginalis is incriminated as one of the causes of their infertility.

El-Shazly, A. M., H. M. El-Naggar, et al. (2001). “A study on Trichomoniasis vaginalis and female infertility.” J Egypt Soc Parasitol **31**(2): 545-53.

> A total of 280 patients, 240 infertile and 40 pregnant were subjected to thorough history taking, general and local examination for exclusion of organic lesion, laboratory investigations to exclude parasitic, bacterial and fungal infections. Sterile vaginal swab from the posterior fornix was taken, and examined by wet smear preparation, Giemsa staining and cultivation on C.P.L.M. medium for trichomoniasis infection. The mean age of the infertile group was 25.75+/-3.92, and of the control group was 21.6+/-2.38 (in years). The mean duration of infertility was 2.81+/-1.51 (years). Out of 240 infertile women, 18.75% complained of discharge, 17.5% itching, 15.42% dysuria, 14.58% dyspareunia, and 10% had cervical lesion. Of the 40 controls, 5% complained of discharge, 2.5% complained of itching, dysuria, dyspareunia, but none had cervical lesion. Of the total cases (280), 36 (12.9%) had T. vaginalis. The clinical data observed were significantly higher among the infertile group than the control group. Cultures were positive in 14.58% of the infertile group and 2.5% in the control group. The difference between the 2 groups was statistically significant. No doubt, T. vaginalis plays an important role in female infertility.

Grodstein, F., M. B. Goldman, et al. (1993). “Relation of tubal infertility to history of sexually transmitted diseases.” Am J Epidemiol **137**(5): 577-84.

> We studied the history of sexually transmitted diseases in 283 nulliparous women diagnosed with infertility due to tubal adhesions or occlusion and 3,833 women admitted for delivery at seven collaborating hospitals. The adjusted risks of tubal infertility associated with the history of each sexually transmitted disease were estimated by the odds ratios obtained by multiple logistic regression. Women who reported prior infection with gonorrhea were at a significantly increased risk of tubal infertility (relative odds = 2.4, 95% confidence interval 1.3-4.4). In addition, the risk of tubal infertility was almost twice as high in women who recalled previous trichomoniasis compared with women with no such infection (relative odds = 1.9, 95% confidence interval 1.3-2.8). Furthermore, there was a trend of increasing risk with an increasing number of episodes of gonorrhea or trichomoniasis.

Jarecki-Black, J. C., W. B. Lushbaugh, et al. (1988). “Trichomonas vaginalis: preliminary characterization of a sperm motility inhibiting factor.” Ann Clin Lab Sci **18**(6): 484-9.

> This study determined the effects of Trichomonas vaginalis trophozoites, subcellular fractions, and medium from axenic T. vaginalis cultures on human sperm motility and viability. Spent medium (pH 7.0) caused complete cessation of sperm motility after 15 minutes incubation. Trophozoite soluble fraction or formalin-killed trophozoites caused a 50 percent reduction in sperm motility, compared to 25 percent reduction caused by the trophozoite particulate fraction or the sterile medium and three percent by saline (control). Spent medium from T. vaginalis cultures reaching stationary growth phase produced the greatest reduction in sperm motility, suggesting that potency was related to time in culture and trophozoites per ml. The T. vaginalis spermicidal activity was heat-stable, trypsin-sensitive, and had a molecular weight of 12-15,000 by gel filtration. This proteinaceous substance was present in and secreted by T. vaginalis trophozoites during normal growth in axenic culture. Since this T. vaginalis byproduct rapidly killed sperm in vitro, its effects in humans may contribute to infertility in infected couples.

Okonofua, F. E., K. A. Ako-Nai, et al. (1995). “Lower genital tract infections in infertile Nigerian women compared with controls.” Genitourin Med **71**(3): 163-8.

> OBJECTIVE--To investigate the possibility that infertile Nigerian women have a higher rate of cervical colonisation with pathogenic and facultative organisms than fertile controls. DESIGN--The prevalence of common microorganisms in the vagina and endocervical canals of infertile women was compared with that of pregnant controls. SETTING--The Obafemi Awolowo University Hospital Maternity Centre. SUBJECTS--92 infertile women were compared with 86 pregnant controls. MAIN OUTCOME MEASURES--rates of isolation of Neisseria gonorrhoeae, Candida albicans, Trichomonas vaginalis and other facultative organisms in cases and controls. RESULTS--The rate of isolation of Neisseria gonorrheae was 17.4% among infertile women compared with 10.5% in the group of pregnant women ($p > 0.05$). There was no significant difference between the groups in the rate of isolation of Candida albicans, Trichomonas vaginalis and other facultative organisms. High rates of isolation of microorganisms were observed in both groups. However, women with secondary infertility had higher rate of carriage of Neisseria gonorrheae, Candida albicans and Staphylococcus aureus as compared with women with primary infertility. Nearly 15% of infertile women had previous episodes of pelvic inflammatory disease and 26% had had induced abortions. A positive history of vaginal discharge was a poor predictor of vagina and endocervical carriage of microorganisms. CONCLUSIONS--High rates of pathogenic organisms exist in the lower genital tract of infertile women and controls. Women with secondary infertility are more likely to have pathogenic organisms than women with primary infertility. A policy of routinely screening women for lower genital tract infections should be pursued in this population because of the high rate of infection.

Passey, M., C. S. Mgone, et al. (1998). “Community based study of sexually transmitted diseases in rural women in the highlands of Papua New Guinea: prevalence and risk factors.” Sex Transm Infect **74**(2): 120-7.

> OBJECTIVE: To estimate the prevalence of sexually transmitted diseases (STDs) and determine their risk factors/markers among a rural population of women in the highlands of Papua New Guinea. METHODS: Community based random cluster sample of women of reproductive age were interviewed and examined and had specimens collected for laboratory confirmation of chlamydial and trichomonal infection, gonorrhoea, syphilis, and bacterial vaginosis. RESULTS: Chlamydia

trachomatis was detected in 26%, Trichomonas vaginalis in 46%, Neisseria gonorrhoeae in 1%, syphilis in 4%, pelvic inflammatory disease (PID) (diagnosed clinically) in 14%, and bacterial vaginosis in 9% of 201 women. 59% of the women had at least one STD. In a multivariate logistic regression analysis taking the clustered sampling into account, independent risk factors for chlamydial infection were age < or = 25 years, < four living children, visualization of yellow mucopurulent endocervical secretions on a white swab, and bacterial vaginosis. Being married to a man who did not have other wives was protective. For trichomonal infection, independent risk factors were having no formal education, infertility, more than one sexual partner in the previous 12 months, treatment for genital complaints in the previous 3 months, abnormal vaginal discharge detected on examination, and chlamydial infection. Similar levels of trichomonal infection were found in all age groups. Among married women, rates of infection correlated with their perception of their husband having had other sexual partners in the previous 3 months, and this relationship was significant for chlamydial infection among women over 25. CONCLUSION: STDs are a major problem in this population, with the risk factors varying by outcome. Current treatment regimens are inappropriate given the high prevalence of trichomonal infection, and the available services are inadequate. Effective interventions are required urgently to reduce this burden and to prevent the rapid transmission of HIV.

Sherman, K. J., J. R. Daling, et al. (1987). “Sexually transmitted diseases and tubal infertility.” Sex Transm Dis **14**(1): 12-6.

To evaluate the association of genital herpes, genital warts, gonorrhea, and trichomoniasis with the occurrence of subsequent tubal infertility, 321 women who had tubal infertility were interviewed concerning their history of these sexually transmitted diseases (STD). The responses were compared to those of women who conceived children during the period the infertile women began trying to become pregnant. By a multivariate analysis, the comparisons were controlled for several confounding variables (e.g., use of an intrauterine device, cigarette smoking, number of prior pregnancies, number of sexual partners, and a history of the other STD). The risk of tubal infertility in women who reported at least one episode of gonorrhea after their last pregnancy, relative to that among other women, was 2.8 (95% confidence interval = 1.3-5.7). The relative risk of tubal infertility was also higher among women who reported a history of trichomoniasis (relative risk = 1.4; 95% confidence interval = 1.0-2.5) or genital warts (relative risk = 1.9; 95% confidence interval = 1.0-3.6).