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## Trichomonas Vaginalis among Parturient Sudanese women in Kassala Hospita, Eastern Sudan

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**Abstract: Background:** Trichomoniasis in the women is usually asymptomatic however the disease might be manifested as vaginitis, cervicitis, urethritis, pelvic inflammatory disease (PID), and adverse birth outcomes.

**Methods:** A case-control hospital based study conducted at Kassala Hospitals, eastern Sudan during the period from 1st January 2015 to 30th June 2015 to investigate the prevalence rate of Trichomoniasis during pregnancy and its impact on neonatal outcome. **Results:** During the study period there were 199 infected women with *T vaginalis* among 2374 deliveries yielding a prevalence rate of 8.3%. The vast majority (140/199, 70.4%) was asymptomatic while the rest presented with vaginal discharge (33/199, 16.6%), itching (16/199, 8%) and dysuria (10/199, 5%). With regard to membranes status and neonatal outcome higher proportion of infected women presented with premature ruptured membranes (30, 15.1% Vs 6, 3%;  $P = 0.000$ ) and gave preterm birth (31, 15.6% Vs 7, 3.5%;  $P = 0.000$ ). Using logistic regression analysis the study showed significant association between Trichomoniasis, preterm birth (CI= 1.1 – 13.6, OR= 3.9,  $P = 0.030$ ) and premature rupture of the amniotic sac before 4 centimeter dilatation (CI= 1.0 3.2, OR= 1.8,  $P = 0.025$ ). **Conclusion:** Trichomoniasis is highly prevalent among parturient women in eastern Sudan, and there is significant association between Trichomoniasis, preterm birth and premature ruptured membranes.

**Keywords:** Trichomoniasis; Infection; Preterm; Pregnancy; Sudan.

### 1. Introduction

Trichomoniasis is a major sexually transmitted disease caused by the protozoan parasite *Trichomonas vaginalis*. *Trichomonas vaginalis* has neither been the focus for intensive studies nor for active control programs in sub-Saharan Africa and this neglect likely due to the relatively mild nature of the disease. However available evidence suggests a critical role of the disease in HIV transmission and dynamics as well as its adverse pregnancy outcomes and that it persists for many years if not treated [1]. It is more common than the bacterial sexually transmitted infections such as Chlamydia, gonorrhea and syphilis [1]. The infection in the women is usually asymptomatic however the disease might be manifested as vaginitis, cervicitis, urethritis, pelvic inflammatory disease (PID), and adverse birth outcomes [2]. It has been reported that the infection is associated with bacterial vaginosis [3] and the infected persons with *T. vaginalis* are at a higher risk of HIV than those who are not infected with *T. Vaginalis* [4]. Worldwide the prevalence of the disease ranged between 5 – 74% in the women with the highest rate reported among those who have other sexually transmitted infections [5]. *Trichomoniasis* during pregnancy has been linked to many obstetric complications such as premature rupture membranes, preterm birth and low birth weight [6]. In Sudan little data exist on *Trichomoniasis* during pregnancy [7] and the infection is a substantial public health burden. Thus this study was designed and directed to investigate the prevalence of *Trichomoniasis* during pregnancy and its impact on neonatal outcome.

### 2. Materials and Methods

A case-control hospital based study conducted at Kassala Hospitals, eastern Sudan during the period from 1<sup>st</sup> January 2015 to 30th June 2015. Kassala, eastern Sudan, is 42282 square kilometer, populated by 1.8 million and it is nearly 600 kilometer from Khartoum, capital of Sudan. Kassala Hospital is specialized, governmental teaching hospital for Obstetrical and Gynecological services and providing free health services for the community. The

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hospital has daily patients turnover ranged from 100-150 patients and referral cases from different rural hospitals in Kassala State. The hospital facilities consist of (100) beds shared between obstetrical and gynecological cases, and also has (4) beds high dependency, (3) beds for intensive care unit (ICU), (2) equipped theatres and (4) delivery tables. There is also a good established Family Planning clinic. In the hospital there are blood bank facilities available for 24 hours, voluntary counseling & testing clinic for HIV/AIDS screening, and laboratory for routine and specific investigations.

In the study area there is no available data on the risk factors for the sexual transmitted infections however the overall seroprevalence of HIV, HBV, HCV and syphilis was 3%, 4.3%, 3.1% and 2.7% respectively [8].

The entire parturient women presented to the labor ward was approached to investigate the prevalence rate of *trichomoniasis* among pregnant women, to identify its different symptoms and to investigate the neonatal outcome of infected women in term of preterm birth, low birth weight and stillbirth. We excluded those who refused to participate in the study and patients who were recently diagnosed as having sexual transmitted infection and on treatment. Two groups were the: parturient women with *trichomoniasis* and healthy (free of *T. vaginalis*) parturient women volunteers were used in this study. After signing informed consent, structured questionnaires were administered to collect information about socio-demographic data (age, education, residence and occupation), parity, symptoms (vaginal discharge and its characteristic, pruritus, dysuria), history of chronic medical disease, history of sexually transmitted infection and risk factor. The fetal weight as well as the gestational age of the newborn babies was recorded to investigate the association of *T. vaginalis* to the preterm birth and low birth weight. Urine sample was obtained to identify the motile parasite during microscopic examination (wet mount). Because the organism rapidly loses its characteristic tumbling motility, the urine sample was suspended in 0.85% normal saline and immediately examined by expert personnel. The gestational age was calculated from the last menstrual period or ultrasound and clinical estimation if last period was not known. Preterm delivery was defined as birth occurring before 37 weeks of gestation. The neonates were weighed immediately to nearest 50g and low birth weight was considered when the neonatal weight was less than 2.5kg. Stillbirth defined as the delivery of a neonate after 28 weeks of gestation with no signs of life. All infected women received single dose of tinidazole according to the hospital protocol.

#### Statistics

The different variables were compared between the women with *T. Vaginalis* and those who were free of the parasite using logistic regression analysis. Data were entered into a computer database and SPSS software (SPSS Inc., Chicago, IL, USA, version 16.0) and double checked before analysis. Univariate and multivariate analyses were performed. *Trichomoniasis* was the dependent variable and socio-demographic characteristic, neonatal outcome was independent variables. Confidence intervals of 95% were calculated and  $P < 0.05$  was considered significant. In case of discrepancy between the results of univariate and the results of multivariate analyses, the later was taken as final

#### Statistics

#### Ethics

The study received ethical clearance from the Ethical Committee at Sudan Medical Specialization Board (SMSB, Khartoum, Sudan) and Ministry of Health, Kassala State.

### 3. Results

During the study period there were 199 infected women with *T vaginalis* among 2374 deliveries yielding a prevalence rate of 8.3%. The majority of these patients were of urban residence (101\199, 50.8%), housewives (164\199, 82.4%) and unbooked (107\199, 53.8%). In comparison with the healthy control group (199 in each arm) the mean (SD) age, parity and gestational age of the infected women was {34.2 (4.3) Vs 34.1 (6.1),  $P=0.859$ }, {3.4 (1.9) Vs 3.4. (1.7),  $P=0.366$ } and {38.2 (1.7) Vs 38.1 (1.9),  $P=0.847$ } respectively. The vast majority (140/199, 70.4%) was asymptomatic while the rest presented with vaginal discharge (33/199, 16.6%), itching (16/199, 8%) and dysuria (10/199, 5%). Almost all of those who presented with vaginal discharge (97.6%) claimed that the discharge was green in colour and offensive in odour. Three patients (1.5%) had history of diabetes mellitus; otherwise no significant medical history was reported among the infected women. With regard to membranes status and neonatal outcome higher proportion of infected women presented with premature ruptured membranes (30, 15.1% Vs 6, 3%;  $P = 0.000$ ) and gave preterm birth (31, 15.6% Vs 7, 3.5%;  $P= 0.000$ ) on the other hand higher proportion of the healthy women gave low birth weight (15, 7.5% Vs 49, 24.6%;  $P= 0.000$ ), table 1. Using logistic regression analysis the study showed significant association between *Trichomoniasis*, preterm birth ( $CI= 1.1 - 13.6$ ,  $OR= 3.9$ ,  $P= 0.030$ ) and premature rupture of the amniotic sac before 4 centimeter dilatation ( $CI= 1.0 3.2$ ,  $OR= 1.8$ ,  $P= 0.025$ ), table 2.

### 4. Discussion

To our knowledge this is the first published data on *T Vaginalis* infection's prevalence and impact on pregnancy outcome in eastern Sudan. The current study showed clearly the high prevalence of *Trichomoniasis* among parturient Sudanese women and the higher proportion of infected patients presented with premature ruptured membranes and gave preterm birth. *Trichomonas vaginalis* is a common health problem with an estimated worldwide incidence of 248 million new cases per year [6]. Sudan has high burden of reproductive health in many aspects; the sexually transmitted infections are one of the major challenges that attributed to many reproductive health morbidities. The prevalence rate of *Trichomoniasis* in this study is in line with what was reported in Upper Egypt (8.7%) and far away from what was observed in Lagos, Nigeria (74.5%) [9, 10]. This discrepancy in the prevalence rate might be

attributed to the different methods used for the diagnosis of the infection also may be due to the presence or absence of the risk factors among the different populations. The identification of the organism using the wet mount method after obtaining urine sample is easy, rapid and cheap however it is of low sensitivity [11]. Our finding is of great value for the health care providers and stake holders; this because of the fact that *Trichomoniasis* facilitates spread of the HIV epidemic [12]. One theoretical calculation concludes that if infection with *T vaginalis* increased the risk of HIV transmission by 90% in a population with 25% prevalence of *Trichomoniasis*, approximately 20% of cases of HIV would be attributable to *Trichomoniasis* [13]. This fact should be considered by programme managers when they put the strategic implementation for the prevention of HIV. The Centers for Disease Control and Prevention (CDC) guidelines recommend that all women presented with vaginal discharge should be investigated for *Trichomoniasis*. Infected women with HIV should be screened for *T. vaginalis* infection [12]. In addition, screening can be considered for asymptomatic women at high risk (with multiple sexual partners, with history of sexually transmitted infection). In the present study the vast majority of the patients were asymptomatic and this is in contrast with what was observed among Nigerian women report which demonstrated that 74% of women who presented with vaginal discharge were infected with *T vaginalis* [10] while in Zimbabwe 75% of women denied symptoms on direct questioning and 16% of these women had *Trichomoniasis* [14]. Dysuria was observed in 5% of infected women, *T vaginalis* is not only restricted to the vagina but also might invade the urinary system. Dysuria was observed in 29% of South African women diagnosed with *T vaginalis infection* [15]. Therefore we have to consider the women who presented with dysuria and the symptom should be regarded as one of the main clinical presentation of *Trichomoniasis*. In the present study there was a significant positive correlation between *Trichomoniasis*, preterm birth and premature ruptured of amniotic sac. Recently, Peterman *et al.*, proved that; without appropriate treatment the *T.vaginalis* may persist for months to years [16] and our findings are in line with what was reported in the literature which found strong association between *Trichomoniasis*, premature rupture of the amniotic sac and preterm labor [17, 18]. Women living in polygamous marriage may be at a greater incidence of STDs however and in contrast to what was written in the literature our results showed no significant association between *T.vaginalis* and polygamous marriage, thus more research in this area is needed [19]. One of the limitations of this study was the use of only one method for the diagnosis of the *Trichomoniasis*, with respect to other methods, the availability of an alternative method will increase the sensitivity for the diagnosis.

## 5. Conclusion

*Trichomoniasis* is highly prevalent among Sudanese parturient women in eastern Sudan and there is a significant association between *Trichomoniasis*, preterm birth and premature ruptured membranes. Because this infection increases the risk of HIV transmission and is associated with adverse pregnancy outcomes, there is increased need for provision of health education, awareness raising, screening and prompt treatment of *T. vaginalis* to the community.

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## Competing Interest

The authors declare that they have no competing interests.

## References

- [1] World Health Organization, 2011. "Prevalence and Incidence of selected sexually transmitted infections, Chlamydia trachomatis, Neisseria gonorrhoeae, syphilis and Trichomonas vaginalis: Methods and Results Used by WHO to Generate 2005 Estimates." Available: [http://whqlibdoc.who.int/publications/2011/9789241502450\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241502450_eng.pdf)
- [2] Swygard, H., Se-na, A. C., Hobbs, M. M., and Cohen, M. S., 2003. "Trichomoniasis: clinical manifestations, diagnosis and management." *Sex Transm Infect*, vol. 80, pp. 91–95.
- [3] Franklin, T. L. and Monif, G. R., 2000. "Trichomonas vaginalis and bacterial vaginosis. Coexistence in vaginal wet mount preparations from pregnant women." *J Reprod Med*, vol. 45, pp. 131–4.
- [4] Allsworth, J. E., Ratner, J. A., and Peipert, J. F., 2009. "Trichomoniasis and other sexually transmitted infections: results from the 2001–2004 national health and nutrition examination surveys." *Sex Transm Dis*, vol. 36, pp. 738-744.
- [5] WHO, 2001. *Global prevalence and incidence of selected curable sexually transmitted infections*. Geneva, Switzerland.
- [6] Secor, W. E., Meites, E., Starr, M. C., and Workowski, K. A., 2014. "Neglected parasitic infections in the United States: Trichomoniasis." *Am.J.Trop.Med.Hyg*, vol. 90, pp. 800-804.
- [7] Ortashi, O. M., El Khidir, I., and Herieka, E., 2004. "Prevalence of HIV, syphilis, Chlamydia, trachomatis, Neisseria gonorrhoea Trichomonas vaginalis and candidiasis among pregnant women attending an antenatal clinic in Khartoum Sudan." *J Obstet Gynaecol*, vol. 24, pp. 513-515.

- [8] Abdallah, T. M. and Ali, A. A., 2012. "Seroprevalence of transfusion- transmissible infectious diseases among blood donors in Kassala, eastern Sudan." *J. Med. Med. Sci*, vol. 3, pp. 260-262.
- [9] Sullam, S. A., Mahfouz, A. A., Dabbous, N. I., el-Barrawy, M., and el-Said, M. M., 2001. "Reproductive tract infection among married women in Upper Egypt." *Estern Mediterranean Health Journal*, vol. 7, pp. 130-146.
- [10] Anorlu, R. I., Fagbenro Beyioku, A. F., A., F. T., and Galdanci, H. C., 2001. "Prevalence of Trichomonas Vaginalis in Patient with vaginal discharge in Lago , Nigeria." *Niger Postgrd Med J*, vol. 8, pp. 183-6.
- [11] Wendel, K. A., Erbeling, E. J., and Gaydos, C. A., 2002. "Trichomonas vaginalis polymerase chain reaction compared with standard diagnsotic and therapeutic protocols for detection and treatment of vaginal trichomoniasis." *Clin Infect Dis*, vol. 35, pp. 576–80.
- [12] Workowski, K. A. and Berman, S. M., 2010. "Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines." *Clin Infect Dis*, vol. 53, pp. S59–S63.
- [13] Sorvillo, F., Smith, L., and Kerndt, P., 2001. "Trichomonas vaginalis, HIV and African- Americans." *Emerg Infect Dis*, vol. 7, pp. 927–32.
- [14] Mbizvo, E. M., Msuya, S. E., and Stray-Pedersen, B., 2001. "Determinants of reproductive tract infections among a symptomatic women in Harare, Zimbabwe." *Cent Afr J Med*, vol. 47, pp. 57–64.
- [15] Pepin, J., Sobela, F., and Deslandes, S., 2001. "Etiology of urethral discharge in West Africa: the role of Mycoplasma genitalium and Trichomonas vaginalis." *Bull World Health Organ*, vol. 79, pp. 118–26.
- [16] Peterman, T. A., Tian, L. H., C.A., M., Satterwhite, C. L., Malotte, C. K., DeAugustine, N., Paul, S. M., Cross, H., Rietmeijer, C. A., *et al.*, 2006. "High incidence of new sexually transmitted infections in the year following a sexually transmitted infection: a case for rescreening." *Ann Intern Med*, vol. 145, pp. 564–572.
- [17] Minkoff, H., Grunebaum, A. N., Schwarz, R. H., Feldman, J., Cummings, M., Crombleholme, W., Clark, L., Pringle, G., and McCormack, W. M., 1984. "Risk factors for prematurity and premature rupture of membranes: a prospective study of the vaginal flora in pregnancy." *Am J Obstet Gynecol*, vol. 150, pp. 965–972.
- [18] Mann, J. R., McDermott, S., and Gill, T., 2010. "Sexually transmitted infection is associated with increased risk of preterm birth in South Carolina women insured by Medicaid." *J Matern Fetal Neonatal Med*, vol. 23, pp. 563–568.
- [19] Ashby, B. and Gupta, S., 2013. "Sexually transmitted infections in polygamous mating system." *Phil. Trans. R. Soc. B*, vol. 368. DOI: 10.1098/rstb.2012.0048.

**Table-1.** comparison between infected and non-infected women with *Trichomoniasis* in Kassala Hospital, Sudan using chi-square test.

| Variables           | Infected women (N=199) | Non infected women (N=199) | P     |
|---------------------|------------------------|----------------------------|-------|
| Preterm birth       | 31(15.6)               | 7 (3.5)                    | 0.000 |
| PROM                | 30(5.1)                | 6(3)                       | 0.000 |
| LBW, <2.5kg         | 15(7.5)                | 49(24.6)                   | 0.000 |
| History of STI, yes | 28(14.5)               | 9(4.5)                     | 0.001 |
| Antenatal care, yes | 92(46.2)               | 91(45.7)                   | 0.500 |

Data are shown as number (%) as applicable

**Abbreviation:** PROM=premature ruptured of membranes; STI=sexual transmitted infection; LBW=low birth weight.

**Table-2.** comparison between infected and non-infected women with *Trichomoniasis* in Kassala Hospital, Sudan using univariate and multivariate analyses.

| Variable              | Univariate analyses |          |        | Multivariate analyses |         |         |
|-----------------------|---------------------|----------|--------|-----------------------|---------|---------|
|                       | OR                  | 95% CI   | P-valu | OR                    | 95% CI  | P-value |
| Age, ≥35              | 0.9                 | 0.9-1.0  | 0.856  | 0.9                   | 0.9-1.0 | 0.562   |
| Parity ≥5             | 0.9                 | 0.8-1.0  | 0.365  | 0.8                   | 0.7-1.0 | 0.052   |
| Rural residence       | 0.9                 | 0.8-1.1  | 0.871  | 0.9                   | 0.8-1.1 | 0.664   |
| Education, <secondary | 1.2                 | 0.7-2.2  | 0.398  | 1.4                   | 0.7-2.5 | 0.274   |
| Occupation, housewife | 0.8                 | 0.9-1.1  | 0.736  | 0.9                   | 0.8-1.1 | 0.489   |
| Polygamy              | 1.3                 | 0.5-3.1  | 0.452  | 1.5                   | 0.7-3.3 | 0.942   |
| ANC, yes              | 1.0                 | 0.6-1.4  | 0.986  | 1.3                   | 0.8-2.0 | 0.171   |
| Preterm birth         | 0.5                 | 2.1-11.6 | 0.000  | 3.9                   | 1.1-13  | 0.030   |
| LBW, <2.5kg           | 0.2                 | 0.1-0.4  | 0.000  | 0.3                   | 0.1-0.4 | 0.000   |
| PROM                  | 5.6                 | 2.3-13.8 | 0.000  | 1.8                   | 1.0-3.2 | 0.025   |

Abbreviations: OR, Odds Ratio; CI, confidence interval; ANC, antenatal care; LBW, low birth weight; PROM, premature ruptured membranes.