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ORIGINAL ARTICLE

Trichomonas vaginalis / AWARENESS OF TRICHOMONIASIS IN WOMEN ATTENDED BY THE HEALTH SERVICE OF BAGÉ, RS, BRAZIL

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ABSTRACT

This study aimed to measure the level of awareness of *Trichomonas vaginalis* / trichomoniasis and other sexually transmitted diseases (STDs), in 300 women from 19 municipalities in the southwest region of Rio Grande do Sul, Brazil, who sought the gynecology sector of the Basic Healthcare Centers in the Municipality of Bagé from January to June 2013. The data were collected through a semi-structured questionnaire, and the results were tabulated and organized using Excel® 2010 software. Only 5.7% of the participants said they were aware of *T. vaginalis* / trichomoniasis and had a little information on HIV and Aids in reference to other STDs. Schooling alone was significant ($p = 0.0135$), as women who had a high school diploma or higher education were 6.6 times more likely to be aware of *T. vaginalis*. There is, therefore, a need to devise better educational campaigns, addressing this and other STDs, such as trichomoniasis, given the lack of knowledge about this parasite, its high frequency and possible escalation.

KEY WORDS: Sexually transmitted diseases (STD); trichomoniasis; knowledge.

INTRODUCTION

Approximately 340 million people are afflicted by curable sexually transmitted diseases (STDs) every year, mainly those caused by *Neisseria gonorrhoeae, Chlamydia trachomatis* and *Trichomonas vaginalis*. Among these infections, trichomoniasis is the most common non-viral STD worldwide and has been associated with increased HIV transmission (McClelland et al., 2007).

According to the World Health Organization (WHO), there are 170 million cases of trichomoniasis worldwide in people between 15 and 49 years of age, most of them in women (92%) (Maciel et al., 2004). Studies in Brazil have shown that the prevalence of *T. vaginalis* infection varies from 2.6% to 20% in women evaluated in primary care centers in different regions of the country (Ambrozio et al., 2016).

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The protozoan *T. vaginalis* affects both sexes, colonizing the epithelium of the genitourinary tract; however, it is predominant in women. The main symptoms are fetid and foamy vaginal discharge, vulvar pruritus, burning urination and discomfort during sexual intercourse (Lima et al., 2013; Secor et al., 2014). The disease, when left untreated, may lead to serious health hazards, including premature birth, low birth weight, infertility and pelvic inflammation (Javanbakht et al., 2013; Mielczarek & Blaszkowska, 2016).

Male infection can be divided into: an asymptomatic state, which is worrying, since they then become disseminators of the parasite, spreading the infection further; an acute state, whose main symptom is purulent urethritis and a mild asymptomatic disease, difficult to differentiate from other causes of urethritis. In the symptomatic state, discharge, dysuria, penile ulceration, pruritus and a burning sensation after sexual intercourse may also occur (Petrin et al., 1998; Bowden and Garnett, 1999; Muzny et al., 2014). In addition to being noted as one of the causes of non-gonococcal urethritis (NGU), the infection has been associated with prostate cancer and infertility (Schwebke and Hook, 2003; Seo et al., 2014; Mercer et al., 2016).

T. vaginalis protozoan is an important co-factor in the increase of HIV transmission, as the infection causes an aggressive local cellular immune response causing inflammation of the vaginal epithelium in women and the urethra in men, inducing a large infiltration of leukocytes, to which the HIV virus can connect and gain access. In addition, this parasite usually causes bleeding points in the mucosa, which allows the virus direct access to the circulatory current (Maciel et al., 2004; Kissinger and Adamski, 2013). Female patients with trichomoniasis are estimated to be up to six times more likely to acquire HIV infection than uninfected women (Hook, 1999; Poole and McClelland, 2013).

Although it is spread worldwide, trichomoniasis is a neglected condition due to limited awareness of the parasite, its sequelae and lack of understanding of its public health impact (Meites, 2013; Secor et al., 2014). A study conducted in 2014 found that women, especially those single, are at risk of contracting trichomoniasis and other STDs owing to lack of information regarding infection and its parasitic agent, and the non-use of preventive measures (Neto et al., 2014). This parasitic disease is easy to diagnose and prevent, nonetheless there is great prevalence both nation and worldwide. This may be due to the women's lack of awareness of their vulnerabilities. An example of this is a pregnant women study at a University Hospital in Rio de Janeiro, where incorrect forms of prevention were mentioned, such as having only one sexual partner and the use of hormonal contraceptives (Fonte et al., 2012).

Thus, given the lack of research on women's awareness of this parasitic disease, this study aimed to measure the level of information on trichomoniasis and other STDs in women attended by the Unified Health System in southern Brazil.

MATERIAL AND METHODS

The study was carried out in the municipality of Bagé, located in southwestern Rio Grande do Sul (RS) State, Brazil (54º06'25''O / 31º19'31 ''S) seat of the 7th Regional Health Coordination of the State. The studied population consisted of adult women living in Bagé as well as neighboring municipalities who sought the gynecology department of Basic Healthcare Centers in the municipality from January to June 2013.

Data collection started after participants signed an Informed Consent Form. They were then asked to answer a previously tested, semi structured questionnaire including the following items: (i) Socioeconomic and behavioral variables - age, schooling, marital status, family income, place of residence, oral contraceptive use, condom use in intercourse, and the number of partners over the last 12 months; (ii) Information Variables - "Do you know/have you heard of *Trichomonas vaginalis* / trichomoniasis?"; "Do you know/have you heard of STD?"; "Where did you hear of *Trichomonas vaginalis* / trichomoniasis or STD?"; "Do you believe there is lack of information on these topics?". Collection and analysis of vaginal secretion was also performed with a view to identifying eventual *T. vaginalis* infection and its risk factors, however, these results were reported in another stage of the research (Ambrozio et al., 2016).

The study was authorized by the Bagé Municipal Health Department and sanctioned by the Research Ethics Committee of the Medical School of the Federal University of Pelotas (UFPel) under Protocol n. 284.006. After the questionnaire was applied, material was distributed with further information on trichomoniasis and the most usual forms of preventing STDs in Brazil.

All information collected was transferred to the Microsoft Office Excel® 2010 software. To verify statistical significance between groups, the chi-square (χ^2) and the Odds Ratio (OR) tests were used to analyze different variables.

RESULTS

Three hundred women from 19 municipalities in southwest Rio Grande do Sul State were interviewed. When asked if they were aware of trichomoniasis or *T. vaginalis*, 283 (94.3%) said they had never heard of it or did not know anything about it, this knowledge being restricted to 5.7% of the interviewees. As for the variables tested, only schooling was significant ($p = 0.0135$), and those women who had finished high school or had higher education were 6.6 times more likely to be aware of the existence of *T. vaginalis* (Table 1).

As for trichomoniasis positivity, all interviewees who were diagnosed with *Trichomonas vaginalis* (27 or 9%) stated that they did not know of this infection; on the other hand, those who reported knowing about the parasite were negative except for one who had the protozoan. Of the respondents who

were aware of the protozoan, 47% (8) had learned about the parasite at school, 23% (4) at the health centers, 11.7% (2) had been informed by their doctors, 5.8% (1) by relatives or neighbors, while three of them worked in healthcare. Of those who were informed on STDs, the majority (55.5%) reported having learned about the topic at school.

As for the women's awareness of STDs, the results were quite different, with 90.7% (272) of women reporting being aware of them. However, this knowledge was non-specific and, as a rule, respondents defined them as "diseases acquired through sex", and only HIV or AIDS were cited spontaneously. It is worth mentioning that no other diseases, such as syphilis, gonorrhea, chlamydia, or HPV, was reported. When questioned if they lacked information on the subject, 63.7% (191) stated that they did and that they would like to be better informed (*T. vaginalis* / other STDs).

Table 1. Variables of women interviewed (n = 300) associated with awareness of *Trichomonas vaginalis* / Trichomoniasis in southwestern Rio Grande do Sul State, Brazil.

Variables	Total	Knew*	%	p-value	OR (CI)
Age group:					-
18-39	200	11	5.5	0.8599	
40 ou >	100	06	6.0		
Fixed family income:**					
Up to 1 minimum wage	135	07	5.2	0.5771	-
2 to 7 minimum wages	165	10	6.1		
Education:					
Elementary school	140	02	1.4	0.0135	6.56 (1.47 – 29.19)
High school or superior	160	15	9.4		
Marriage Status:					
Married	123	07	5.7	0.9878	-
Single or divorced or widow	177	10	5.6		
T. vaginalis:					
Positive	27	00	0.0	0.3612	-
Negative	273	17	6.2		

*Knew about *Trichomonas vaginalis*/Trichomoniasis **only 13 people received more than three minimum wages

DISCUSSION

In this study, only schooling showed statistical significance on *T. vaginalis* / trichomoniasis awareness, which is in agreement with a study by Miranda et al. (2013), who found that people with higher education had more information regarding STD. However, our results did not agree with those of Neto et al. (2014), who conducted a study in the city of Parnaíba, State of Piauí, Brazil, and concluded that schooling is irrelevant to the awareness of *T. vaginalis*.

The results of this study indicate that, regardless of age, marital status and family income (Table 1), trichomoniasis awareness does not differ significantly, unlike a study by Neto et al. (2014), in which married, older and higher class women were better informed about the parasite. This parasite affects mainly low-income populations, further contributing to its classification as a neglected parasitic infection (Secor et al., 2014). In this study, since there were few interviewees who earned more than three minimum wages (4.3% or 13 people), the difference in income was possibly not relevant to the point of improving the quality of life of those surveyed, inasmuch as people living on one to three minimum wages tend to have a relatively similar standard of living.

Regarding where the interviewees learned about *T. vaginalis* or STD, school was the most commonly mentioned alternative, which shows that, in spite of all the structural problems, school still plays an important role in sex education, indicating that health promotion projects should also be developed in this environment, even as a means of upgrading them (Fonseca, 2002). It is likely, therefore, that women with higher levels of schooling were significantly more aware of the subject.

Pubmed, Scielo, and Academic sites were investigated by using keywords (knowledge, perceptions, attitudes) on the *Trichomonas vaginalis* / trichomoniasis topic, and only a few articles were found on the subject, which limited the present discussion on evaluations of this nature (Gerhard et al., 2008; Neto et al., 2014; Sekirime et al., 2001). It should be noted that most studies on *T. vaginalis* deal with prevalence, epidemiology and diagnosis, while more specific research focusing on "knowledge, attitudes and practices" associated with STDs usually refer to HIV/AIDS (Bretas et al., 2009; Carleto et al., 2010; Lazarotto et al., 2008; Shokoohi et al., 2016). It is noteworthy that research carried out in Kampala, the capital and largest city of Uganda, detected that 33.5% of the women had already heard of *T. vaginalis* but, in spite of previous knowledge of this parasite or other STDs, did not alter their sexual behavior (Sekirime et al., 2001). This rate can be considered high in comparison with this study. The difference may be due to the fact that the Kampala study was conducted with college students, who represented only 1.7% of our sample, as only 5 women reported having either incomplete

or complete higher education. Better information was reported on STD, highlighting previous HIV or AIDS knowledge. Similarly, a study done with adolescents by Bretas et al.(2009) showed that most teenagers had some information on STDs, with a higher reference to AIDS; the worrying aspect, though, according to the authors, was the lack of knowledge on other sexually transmitted diseases such as trichomoniasis, candidiasis and condylomata acuminata (Human Papillomavirus-HPV). Gerhardt et al. (2008) also carried out research on STD awareness, and the most frequently mentioned disease was AIDS, followed by syphilis and gonorrhea. In another study by Romero et al. (2007), the most frequent disease referred to was, again, AIDS (39%), whereas other diseases such as candidiasis, HPV and soft chancre were hardly remembered. References to trichomoniasis as an STD were rare.

This shows that the general population is not informed on *T. vaginalis* and other STDs, other than the HIV virus and AIDS, which can be related to the absence of informative materials on trichomoniasis and other STDs both in health centers and in the Secretariat of Health of the municipality of Bagé. Even on the internet, information on the subject is scarce. The lack of educational campaigns on *T. vaginalis* may entail additional public health costs, since pregnancy complications and an increase in probable HIV infection, among other health alterations, have been confirmed due to this parasitic disease (Secor et al., 2014). Even with regard to other venereal diseases, despite the fact that most of the interviewees in this study claimed to be aware of STDs, 63.7% (191), they also reported they would like to know more on the subject and see this information disseminated. In this regard the health professionals' own approach to their patients could be adapted since, in general, women's health care is restricted to technical procedures such as breast, cytopathology and prenatal care examinations, without really discussing issues related to women's vulnerability to STDs, thus clarifying incorrect notions on some diseases , while enabling the interchange of information and offering guidance (Rodrigues et al., 2011). Campaigns to encourage the use of condoms in sexual relations should be intensified, which is a major task to be carried out by health teams (Taquette et al., 2004). As for trichomoniasis, Passos et al. (2006) stated it is a classically neglected epidemic which is nevertheless curable; yet, it is not a public health issue that is about to be addressed due to the present negligence regarding this condition.

It could be concluded that the awareness of *T. vaginalis* among the women interviewed in southwestern Rio Grande do Sul State is very low (5.7%). This study suggests that educational campaigns are commonly targeted at HIV and AIDS; however, sex education activities aimed at health promotion should be strengthened and expanded, addressing other sexually transmitted diseases, such as trichomoniasis, due to the great lack of awareness on this parasitic disease, its high frequency, and the eventual severity it can take on.

REFERENCES

1. Ambrozio CL, Nagel AS, Jeske S, Bragança GCM, Borsuk S, Villela MM. *Trichomonas vaginalis* prevalence and risk factors for women in Southern Brazil. *Rev Inst Med Trop Sao Paulo 58*: 1-5, 2016.
2. Bowden FJ, Garnett GP. Why is *Trichomonas vaginalis* ignored? *Sex Transm Infect 75*: 372-374,1999.
3. Bretas JRS, Ohara CVS, Jardim DP, Muroya RL. Conhecimento sobre DST-AIDS por estudantes adolescentes. *Rev Esc Enferm USP 43*: 551-557, 2009.
4. Carleto AP, Faria CS, Martins CB, Souza SP, Matos KF. Conhecimentos e Práticas dos Adolescentes da Capital de Mato Grosso quanto às DST/Aids. *J Bras Doenças Sex Transm 22:* 206-211, 2010.
5. Fonseca A. Prevention of Sexually Transmitted Diseases and AIDS in the school environment. *Interface Comunic Saude Educ 6*: 71-88, 2002.
6. Fonte VR, Spindola T, Martins ER, Francisco MT, Clos AC, Pinto RC. Conhecimento de gestantes: prevenção DST/AIDS. *Rev Enferm UERJ 20*: 493-499, 2012.
7. Gerhardt CR, Nader SS, Pereira DN. Doenças Sexualmente Transmissíveis: conhecimento, atitudes e comportamento entre os adolescentes de uma escola pública. *Rev Bras Med Fam e Comum 3*: 257-270, 2008.
8. Hook EW. *Trichomonas vaginalis*. No Longer A Minor STD. *Sex Transm Dis 26*: 388-389, 1999.
9. Javanbakht M, Stirland A, Stahlman S, Smith LV, Ruel MC. Prevalence and Factors Associated with *Trichomonas vaginalis* Infection among High-risk Women in Los Angeles. *Sex Transm Dis 40*: 800-807, 2013.
10. Kissinger P, Adamski A. Trichomoniasis and HIV interactions: a review. *Sex Transm Infect 89*: 426-433, 2013.
11. Lazzarotto AR, Kramer AS, Hadrich M, Tonin M, Caputo, P, Sprinz E. O conhecimento de HIV-AIDS na terceira idade: estudo epidemiológico no Vale dos Sinos, Rio Grande do Sul, Brasil. *Cien Saude Colet 13*: 1833-1840, 2008.
12. Lima MC, Albuquerque TV, Neto AC, Rehn VN. Prevalência e fatores de risco independentes à tricomoníase em mulheres assistidas na atenção básica. *Acta Paul Enferm 26*: 331-337, 2013.
13. Maciel GDP, Tasca T, De Carli GA. Aspectos clínicos, patogênese e diagnóstico de *Trichomonas vaginalis. J Bras Patol Med Lab 40*: 152-160, 2004.
14. McClelland RS, Sangare L, Hassan WM, Lavreys L, Mandaliya K, Kiarie J, Ndinya-Achola J, Jaoko W, Baeten JM. Infection with *Trichomonas vaginalis* Increases the Risk of HIV-1 Acquisition. *J Infect Dis 195*: 698-702, 2007.
15. Meites E. Trichomoniasis: The "Neglected" Sexually Transmitted Disease. *Infect Dis Clin North Am 27*: 755-764, 2013.
16. Mercer F, Diala FGI, Chen YP, Molgora BM, Ng SH, Johnson PJ. Leukocyte Lysis and Cytokine Induction by the Human Sexually Transmitted Parasite *Trichomonas vaginalis*. *PloS Negl Trop Dis 10*: 1-19, 2016.
17. Mielczarek E, Blaszkowska J. *Trichomonas vaginalis*: pathogenicity and potential role in human reproductive failure. *Infection 44*: 447-458, 2016.
18. Miranda AE, Ribeiro D, Rezende EF, Pereira GF, Pinto VM, Saraceni V. Associação de conhecimento sobre DST e grau de escolaridade entre conscritos em alistamento ao Exército Brasileiro. Brasil, 2007. *Cien Saude Colet 18*: 489-497, 2013.
19. Muzny CA, Blackburn RJ, Sinsky RJ, Austin EL, Schwebke JR. Added benefit of nucleic acid amplification testing for the diagnosis of *Trichomonas vaginalis* among men and women attending a sexually transmitted diseases clinic. *Clin Infect Dis 59*: 834-841, 2014.

20. Neto PM, Silva SN, Carvalho FP, Burgos, VO. Inquérito comportamental Sobre Fatores de Risco a *Trichomonas vaginalis. Unopar Cient Cient Biol Saude 16*: 9-13, 2014.
21. Passos MRL, Barreto NA, Varella RQ, Arze WN, Godefroy P, Nogueira JS, Padrão PS. Estudo comparativo da eficácia de esquema oral, vaginal e oral e vaginal combinados para tratamento de vulvovaginites. *Rev Bras Med 63*: 163-173, 2006.
22. Petrin D, Delgaty K, Bhatt R, Garber, G. Clinical and microbiological aspects of *Trichomonas vaginalis. Clin Microbiol Rev 11:* 300-317, 1998.
23. Poole DN, McClelland RS. Global epidemiology of *Trichomonas vaginalis. Sex Transm Infect 89:* 418-422, 2013.
24. Rodrigues LM, Martiniano CS, Chaves AE, Azevedo EB, Uchoa SA. Abordagem às doenças sexualmente transmissíveis em unidades básicas de saúde da família. *Cogitare Enferm 16*: 63-69, 2011.
25. Romero KT, Medeiros EHGR, Vitale MSS, Wheiba J. O conhecimento das adolescentes sobre questões relacionadas ao sexo. *Rev Assoc Med Bras 53*: 14-19, 2007.
26. Schwebke JR, Hook EW. High rates of *Trichomonas vaginalis* among men attending a sexually transmitted diseases clinic: implications for screening and urethritis management. *J Infect Dis 188:* 465-468, 2003.
27. Secor WE, Meites E, Star MC, Workowski KA. Neglected Parasitic Infections: Trichomoniasis. *Am J Trop Med Hyg 90*: 800-804, 2014.
28. Sekirime WK, Tamale J, Lule JC, Mangen FW. Knowledge, attitude and practice about sexually transmitted diseases among University students in Kampala. *Afr Health Sci 1*: 16-22, 2001.
29. Seo JH, Yang HW, Joo SY, Song SM, Lee YR, Ryu JS, Ryu JS, Yoo ES, Lee WK, Kong HH, Lee SE, Lee WJ, Goo YK, Chung D, Hong Y. Prevalence of *Trichomonas vaginalis* by PCR in men attending a primary care urology clinic in South Korea. *Korean J Parasitol 52*: 551-555, 2014.
30. Shokoohi M, Karamouzian M, Mirzazadeh A, Haghdoost A, Rafierad A, Sedaghat A, Sharifi H. HIV Knowledge, Attitudes, and Practices of Young People in Iran: Findings of a National Population-Based Survey in 2013. *PloS One 14*: 1-15, 2016.
31. Taquette SR, De Vilhena MM, De Paula MC. Doenças sexualmente transmissíveis na adolescência: estudo de fatores de risco. *Rev Inst Med Trop Sao Paulo 37*: 210-14, 2004.