



Research Article

Profile of *Chlamydia trachomatis* and *Treponema pallidum* Infections in Patients Aged from 18 To 50 Years Old: Cases of CHU-RN

Tanssoube Ndeune, Tariam Djibangar Agnes*, Djimadoum Kimassoum, Bessimbaye Nadlaou, Bakaranga-Via Issakou, Brahim Boy Otchom, Abdelsalam Tidjani

¹National Reference University Hospital Center Laboratory (CHU-RN), Chad

²Faculty of Human Health Sciences of the University of N'Djamena, Chad

***Corresponding author:** Tariam Djibangar Agnes, National Reference University Hospital Center Laboratory (CHU-RN), Chad.

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Abstract

Introduction: The *Chlamydia trachomatis* is a bacterium responsible for the urogenital infections. Untreated, it can drag some complications including endometriosis, salpingitis, the pelvic inflammatory syndromes, the chronic pelvic pains and the extra uterine pregnancies at the women. Syphilis is a chronic infectious disease caused by the spirochete, *Treponema pallidum*. It causes ulcerative genital lesions that promote the transmission of HIV infection. **Objective:** Material and methods: This study was of the prospective and analytical type which involved 120 patients from which 64 men and 56 women aged from 18-50 years old. The used biological material was blood, and the data compilation technique was based on an interview of patients from a card pre-established with survey variables. **Results:** The prevalence of the infection to *Chlamydia trachomatis* and *Treponema pallidum* was 42.5%. The female gender and the age group from 18 to 38 years old were respectively the most affected with 59% and 14.7%. Some risk factors have been put in evidence: the low social level, the illiteracy (40%), the celibacy (66.7%), the non-use of the condoms (42.5%) and the fact of multiplying partners (71, 8%). **Conclusion:** The infection to *Chlamydia trachomatis* and *Treponema pallidum* is a problem of public health in Chad. It is necessary to lead an awareness against this sexually transmitted infection.

Keywords: STIs; *Chlamydia trachomatis*; *Treponema pallidum*; prevalence; Ndjamen; Chad.

Introduction

STIs are sexually transmitted infections. They represent a worldwide public health problem because of their frequency, their after-effects risks and their role in HIV facilitated transmission. The WHO estimates 357 million new cases of curable STIs in 2012

[1,2]. In developing countries and particularly in Sub-Saharan Africa (SSA), specifically in Chad, STIs are common and remain a public health problem. The consequence of these infections is sterility at men side. The infections Data are scarce given the expensive and often unavailable diagnostic means [3].

Chlamydia trachomatis is a strictly human pathogenic bacterium, with an obligatory intracellular multiplication, at a worldwide distribution. There are 19 serovars of *C. trachomatis*.

Urogenital *Chlamydia trachomatis* infection is the most common bacterial sexually transmitted infection (STI) in France and Europe. It most often affects women under 25 and men under 30. The frequency of asymptomatic forms facilitates its preading [4,5].

Chlamydia trachomatis infection is the highest rate of sexually transmitted bacterial infections. Its management is made difficult by the fact that 50% of cases in men and up to 80% in women are asymptomatic [6,7].

Syphilis is a sexually transmitted systemic bacterial infection caused by *Treponema pallidum* (spirochete bacteria); the disease can be acquired or congenital. A recent increase in the number of cases of syphilis has been noted since the early 2000s. Transmission occurs mainly through sexual contact with mucosal or skin lesions [8].

Early syphilis is defined by an evolution dating back less than a year (J0 being by definition the first day of the chancre). It is the period of the richest syphilis in treponemes.

These infections cause manifestations, the most serious of which is sterility.

As part of an analytical approach, we are interested in these infections because of their pathogenicities which deserve to be studied.

This is why the current study aims at contributing to the early management of *Chlamydia trachomatis* and *Treponema pallidum* infections at CHU-RN and more specifically to:

- ✓ Detect bacteria in blood
- ✓ Identify the factors favoring the transmission of these infections
- ✓ Determine the prevalence of *Clamydia trachomatis* and *Treponema pallidum* infections in the CHU-RN medical analysis laboratory

Methods

Type and place of study

The study of 120 samples for the detection of *Chlamydia trachomatis* and *Treponema pallidum*.

This was a prospective study with an analytical aim which lasted 8 months (from July 2022 to February 2023) at the CHU-RN

Study population

Were included in this study, all patients aged from 18 to 50 years old coming for a blood test at the CHU-RN laboratory agreeing to participate to the study and were excluded from this study all patients who are less than 18 years old and over 50 years

old coming for a blood test at the laboratory. The variables that were studied were:

Age, gender, occupation, multiple partner, education level, marital status, use of condoms.

Blood sample

All patients have benefited from a blood sample that helped to look for Clamydia trachomatis and Treponema pallidum with Rapid Lals Clamydia Rapid Test Device Reference D-CHLAGD20 Lol CHL21040027 and Rapid Lals (Syphilis) Quality Diagnostic Products Reference D reagents. -TPD40 Lol SYP22020022. There is no reference test for the test used.

Principle:

The ultra-rapid Syphilis and Chlamydia test strip (blood, serum, plasma) is a qualitative immunological test consisting of a membrane strip and allows the detection of TP and CT Ab (IgG and IgM) in blood, serum or plasma. In this test, the antigen is fixed in the test area. After the sample is added to the strip, it reacts with Ag-coated particles that have been deposited. This mixture migrates chromatographically along the strip and reacts with the fixed antigens.

The dual antigen format of the test can detect IgG and IgM in samples. If the sample contains TP, TC antibodies, no red line appears indicating a negative result.

As a control procedure, a colored line will always appear in the control area. If the control line does not appear, the result is invalid

Statistical analysis:

Data typing was carried out thank to Microsoft Excel software. Statistical analysis by the means of SPS software. The comparison of patients with infection was carried out by using the Pearson chi-square test depending on the case, a value of P = 0.05 was considered as the significance threshold.

Ethical Considerations

The investigation was carried out after obtaining informed and written consent from the patients. The anonymity of the investigation and the confidentiality of the information obtained were guaranteed. The university ethics committee gave its approval under reference 051.

Results

Table I summarizes the general data of the population composed of 120 samples. The gender ratio was 1.10 (M/F). Women were the most represented in the age group of 28 to 38 years old, i.e., 24.2%, and men in the age group of 18 to 28 years old, i.e., 19.2%.

Picture card 1 shows the analysis of patients according to condom use out of a population of 120, people who had never used condoms were more represented with 43.3% of men and 40.8% of women compared to 9.2% of men and 6.7% of women using condoms regularly. ; i.e. a total of 84.2% of people who have never used condom compared to 15.8%.

Picture card 2 shows the analysis of *Chlamydia trachomatis* and *Treponema pallidum* infections by age group.

Patients in the age group of 18 to 38 years old were more infected with *Chlamydia trachomatis*, i.e. a prevalence of 14.2%, whereas the age group of 28 to 38 years old was contaminated by *Treponema pallidum*, i.e. a prevalence of 7.5%.

Picture card 3 shows the analysis of *Chlamydia trachomatis* and *Treponema pallidum* infections according to sexual partners.

Patients who had multiple partners were more infected with *Chlamydia trachomatis* and *Treponema pallidum* with a prevalence of 71.8% and 81.09% respectively.

Age group	Female		Male		Total	
	N	%	N	%	N	%
[18-28]	16	13,3%	23	19,2%	39	32,5%
[28-38]	29	24,2%	21	17,5%	50	41,7%
[38-48]	12	10,0%	19	15,8%	31	25,8%
Total	57	47,5%	63	52,5%	120	100,0%

Table 1: Distribution of patients by age group and gender.

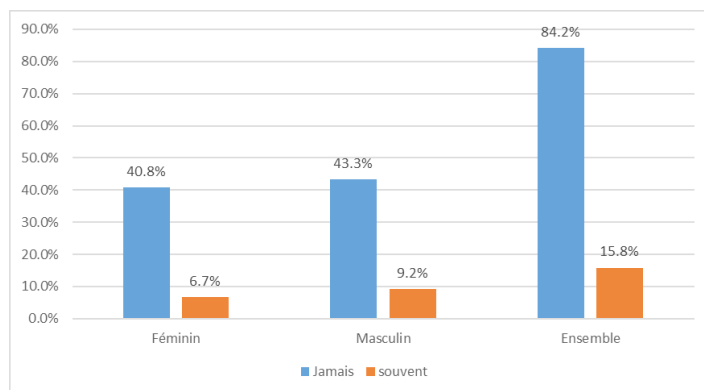


Figure 1: Distribution of patients according to condom use.

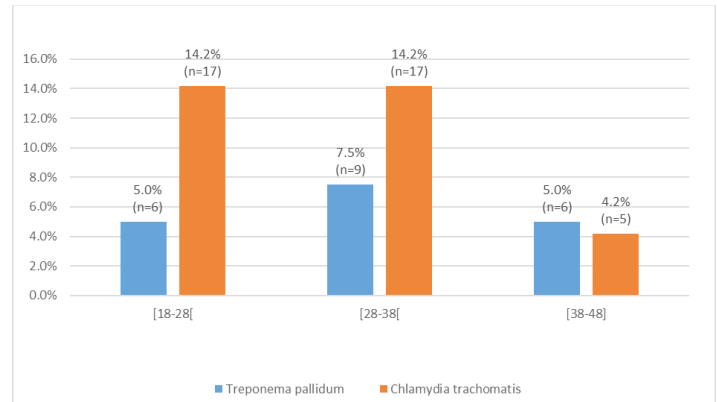


Figure 2: prevalence of *Chlamydia trachomatis* and *Treponema pallidum* infections by age group.

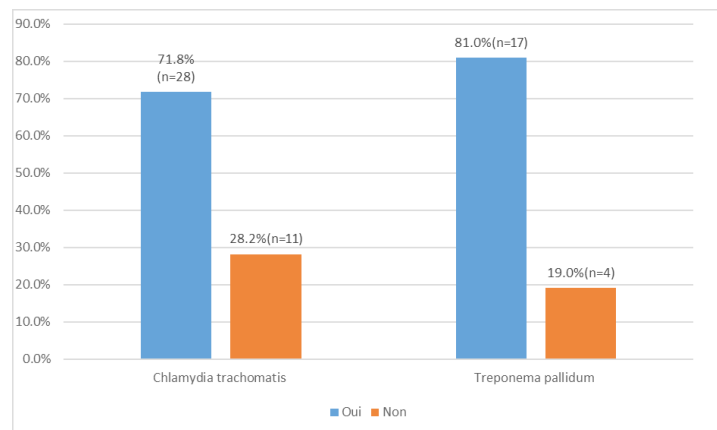


Figure 3: prevalence of infections according to multiple sexual partners.

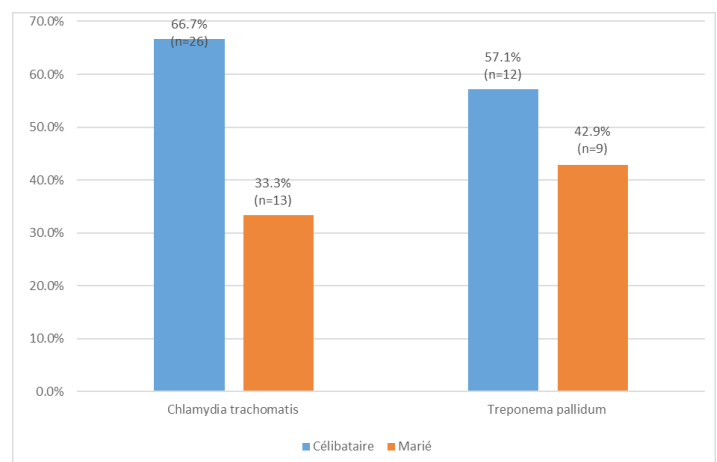


Figure 4: prevalence of *Chlamydia trachomatis* and *Treponema pallidum* infections according to marital status.

Discussion

At the end of the data collection period in the medical analysis laboratory department of CHU-RN, 120 samples were examined out of 137 samples which met the inclusion criteria. 51 were positive, representing a prevalence of 42.5% for *Chlamydia trachomatis* and *Treponema pallidum*.

In our study, the most represented age group was that of 28 to 38 years old with a frequency of 24.2% for women followed by the group of 18 to 28 years old with a frequency of 19.2% for men.

Our results overlap with those of Thiam D in Senegal [9] who found the maximum peak located between 16 and 30 years old; Keita [10], Soumaré [11], Coulibaly and al [12] in Mali who found respectively 50%, 49.4%, 48.91% in the age groups of 15 to 28 years old, 14 to 30 years and 23 to 30 years old.

Our study showed that patients in the age group of 18 to 28 years old were more infected with *Chlamydia trachomatis* with a prevalence of 14.2% compared to 5% for *Treponema pallidum*. On the other hand, patients in the age group of 28 to 38 years old were more infected with *Treponema pallidum* with 14.2% compared to 7.5% with *Chlamydia trachomatis*.

This could be explained by the fact that in these age groups, young people were sexually active.

Out of a total of 120 patients, patients who had never used condoms were more represented with a frequency of 84.2%, i.e., 43.3% of men and 40.8% of women compared to 15.2% of patients who used condoms regularly, i.e., 9.2% of men and 6.7% of women.

The result of this study is that no cases of positivity were reported among people who often use condoms during sexual intercourse (0%).

Our results corroborated those of Cissé [13] in Dakar who showed that the prevalence of people using condoms was zero (0%). Likewise, subsequent studies have shown a strong decrease in the incidence of infections among regular condom users. It has been described in the literature that the risk factors associated with urogenital infection with *Chlamydia trachomatis* and *Treponema pallidum* was the absence of condom use [14-18].

Regarding infection, single people were more infected with *Chlamydia trachomatis* and *Treponema pallidum*, with a respective prevalence of 66.1% and 57.1%.

This could be explained by the multiplicity of partners observed among single people.

Our results corroborated those obtained by Cissé in Dakar [13] and Grosskurth et al in Tanzania [19]. It has been described in the literature that the risk factors for urogenital infection with

Chlamydia trachomatis and *Treponema pallidum* is the multiplicity of partners [19,20].

Conclusion

Chlamydia trachomatis and *Treponema pallidum* infection are sexually transmitted infections, which constitute a public health problem particularly in Chad. The complication of these infections led to sterility in humans, demonstrating the impact of infection with *Chlamydia trachomatis* and *Treponema pallidum*.

Our results showed high rates of *Chlamydia trachomatis* and *Treponema pallidum* infections among single people, multiple sexual partners and non-condom users. It is therefore necessary to consider other complementary studies to assess the impact of these infections on the population and the improvement of patient care.

References

1. WHO (2012) Strategies and analytical methods for strengthening surveillance of sexually transmitted infections 2012.
2. Anonymous (2020) Infectious diseases, especially sexually transmitted diseases. Common Residency course, August 2020. Validation number 084420202.40P.
3. CEDAW (2015) Sexually transmitted infections. Ann dermatol venerol 142: S101-104.
4. Lewis S (2007) Risk factor for HIV/AIDS infection in women. 62P
5. Delfosse A (2020) Prevalence and factors associated with *Treponema pallidum* infections among patients consulting the Screening Center in Reunion over the period from January 2017 to March 2020. [Med Thesis] University of Reunion. 2020: 93
6. Nzou Ngoma E, Kusuman A, Mboloko J.E (2018) Persistence of *Chlamydia trachomatis* infection: contributing factors in sub-Saharan Africa. Ann Med 11:2948.
7. Barbeyrac B, peuchant O, the Hive, Bébear C (2013) Genital infections caused by *Chlamydia trachomatis*. The infectious disease letter. Volume XXVII edition.2013:105.
8. High Authority of Health (2007) A priori evaluation of syphilis screening in France. Summary and perspectives. Saint-Denis la plaine: HAS / SEMESP/ 2007:493.
9. Coulibaly MT (1975) Sexually transmitted diseases in Senegal. Public health problem. [Med Thesis]; 1975, Dakar; No. 9.
10. Ms. Keita A (1981) Contribution to the study of vaginal trichomonas vulvovaginitis regarding 448 observations. Thesis Med. Faculty of Medicine and Pharmacy of Bamako, 1981, No. 22.
11. Soumare D (1988) Lower genital infections in consultation at the gynecology-obstetrics department of Point G hospital (157 observations). [Med Thesis].Ecole Nationale de Médecine de Bamako, 1988, No. 10.
12. Coulibaly M T, Kéita Fasiré S, Ouattara Zanafon, Dao S, Dolo G (2017) Evaluation of the diagnostic and therapeutic management of sexually transmitted infections at the Gabriel Touré University Hospital. Mali Medical.2017; Volume XXXII (1): 7.
13. Cissé C (2002) Determination of the prevalence of *Chlamydia*

- trachomatis* and *Neisseria gonorrhoeae* infections in rural areas (Niakhar) using the Amplicor technique. [Doctoral thesis in pharmacy], Cheikh AntaDiop University, Dakar, 2002; N°72,80p.
14. Tampa M, Sarbu I, Matei C, Benea V, Georgescu SR (2014) Brief History of syphilis. J Med Life 7:4-10.
 15. Shimelis T, Lemma K, Ambachew H, Tadesse E (2015) Syphilis among HIV-infected people in southern Ethiopia: seroprevalence and risk factors. BMC Infect Dis 15:189.
 16. Jawetz E, Melnick JL, Adelberg EA (1973) Spirochetes and other microorganisms. In: Medical Microbiology. Paris: Librairie Maloine 283-287.
 17. College of Infectious and Tropical Diseases Academics. Syphilis and other treponematoses. In E. Pilly. 24th ed. Paris, Vivactis Plus; 2012. 331-335.
 18. Janier M, Dupin N, Bauscarat F, Spenatto N, Bertolotti A, et al., (2016) Late syphilis. In: French Society of Dermatology. Diagnostic and therapeutic recommendations for sexually transmitted diseases. SFD 43-49.
 19. Grosskurth M, Mayand P, Mosha F, Todd J, Senkorok, et al., (1996) Asymptomatic gonorrhoea and Chlamydial infection in rural Tanzanian men. BMJ 312:227-280.
 20. Crichton J, Hickman M, Campbell R, Batista-Ferrer H, Macleod J (2015) Socioeconomic factors and other sources of variation in the prevalence of genital chlamydia infections: A systematic review and meta-analysis. BMC Public Health 15:729.