

Jaccr Infectiology

ISSN 2712-6412

<https://infectiology.jaccrafrica.com>

Volume 7, Numéro 3 (Juillet, Août, Septembre 2025)



Jaccr Infectiology ISSN 2712-6412 est une revue de Jaccr Africa qui est spécialisée dans les Maladies Infectieuses Tropicales en Afrique.

La revue est trimestrielle en parution en ligne. Le délai entre la soumission et la décision finale (Acceptation ou Rejet) est de 04 semaines en moyenne. Cependant un article accepté est publié en ligne en moyenne dans les deux semaines suivant l'acceptation.

Les maladies infectieuses notamment le Paludisme, le VIH Sida, la Tuberculose, Ebola et récemment Coronavirus, constituent un problème majeur de santé publique en Afrique à travers la mortalité et l'impact sur le développement socio-sanitaire dont sont responsables ces maladies.

Selon l'OMS, on estime à plus de 200 millions le nombre de cas de Paludisme dans le monde, avec plus 400. 000 décès. Environ 90 % des décès imputables à cette maladie transmise par des moustiques se produisent sur le continent notamment en Afrique sub-saharienne, tandis que le reste de la mortalité se répartit entre l'Asie du sud-est , l'Amérique du sud, le Pacifique occidental et la Méditerranée orientale.

Jaccr Infectiology voudrait à travers ses publications contribuer à la lutte contre ces maladies dont outre les épidémies, leurs mutations, les nouvelles voies de contamination et la problématique autour des médicaments anti-infectieux sont autant de défis exigeant une formation continue des professionnels de santé fondamentalistes, cliniciens généralistes et spécialistes de tous bords du fait du caractère transversal de ces pathologies pouvant intéresser plusieurs organes.

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**Original article**

**Treatment outcomes for multidrug-resistant tuberculosis in Guinea:
a retrospective cohort study from 2016 to 2019**

Résultats du traitement de la tuberculose multirésistante en Guinée :
étude de cohorte rétrospective de 2016 à 2019

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Résumé

Introduction : Notre objectif était d'évaluer le dépistage et l'évolution de la TB-MR en Guinée de 2016 à 2019.

Méthodologie : Il s'agissait d'une étude de cohorte historique de 4 ans (01 janvier 2016 au 31 décembre 2019). Nous avons inclus les patients tuberculeux multi-résistants, dépistés en Guinée de Janvier 2016 à Décembre 2019. Nous avons procédé à une analyse unie et multivariée pour mettre en exergue les principaux facteurs associés au succès au fil des années de prise en charge.

Résultats : Nous avons observé un accroissement du nombre de cas de TB-MR allant de 137 en 2016 à 225 cas en 2019. La population atteinte de la TB-MR était jeune avec une prédominance masculine (71 %). La majorité des cas ont été notifié au Centre

Antituberculeux de Référence de la carrière (34 %) et au Centre de Dépistage et de Traitement de Tombolia (33 %). La sérologie rétrovirale était positive chez 21 % des patients. L'évaluation du traitement nous a montré que 35 % des patients sont guéris par contre 16 % sont décédé. L'analyse comparative des différentes années, nous a permis d'observer une différence significative entre les résultats de notification par centre ($p_value < 0,001$), le résultat de la sérologie rétrovirale ($p_value < 0,001$), la prise d'ARV ($p_value = 0,001$) la mise du patient sous le cotrimoxazol ($p_value = 0,003$) et on notait également une baisse progressive du délai de mise sous traitement ($p_value < 0,001$). A l'analyse multivariée l'année 2017 ($p_value = 0,034$), la prise en charge au CDT de Tombolia ($p_value < 0,001$) et la positivité sérologie rétrovirale était statistiquement associé au

succès du traitement.

Conclusion : La TB-MR a augmenté progressivement entre 2016 et 2019, les facteurs associés au succès du traitement ont été la sérologie rétrovirale, la prise d'ARV, la prise au Cotrimoxazol et le délai du traitement.

Mots-clés : TB-MR, succès thérapeutique, Guinée.

Abstract

Introduction: Our objective was to assess the detection and evolution of MDR-TB in Guinea from 2016 to 2019.

Methodology: This was a 4-year historical cohort study (January 01, 2016 to December 31, 2019). We included multidrug-resistant tuberculosis patients, screened in Guinea from January 2016 to December 2019. We conducted a united, multivariate analysis to highlight the main factors associated with success over the years of care.

Results: We observed an increase in the number of MDR-TB cases from 137 in 2016 to 225 cases in 2019. The MDR-TB population was young and predominantly male (71%). The majority of cases were reported to the Career Reference Tuberculosis Centre (34%) and the Tombolia Screening and Treatment Centre (33%). Retroviral serology was positive in 21% of patients. The evaluation of the treatment showed us that 35% of the patients were cured and 16% died. The comparative analysis of the different years allowed us to observe a significant difference between the results of the notification by center ($p_value < 0.001$), the result of retroviral serology ($p_value < 0.001$), the use of ARVs ($p_value = 0.001$), the initiation of the patient on cotrimoxazol ($p_value = 0.003$) and there was also a gradual decrease in the time to treatment ($p_value < 0.001$). In the multivariate analysis in 2017 ($p_value = 0.034$), management at the Tombolia CDT ($p_value < 0.001$) and retroviral serology positivity were statistically associated with treatment success.

Conclusion: MDR-TB increased gradually between 2016 and 2019, the factors associated with treatment success were retroviral serology, ARV use,

Cotrimoxazol intake and treatment delay.

Keywords: MDR-TB, therapeutic success, Guinea.

Introduction

Multidrug-resistant tuberculosis (MDR-TB) or XR-TB is a global public health problem [1]. They represent a major challenge on a human, financial and organisational level. The duration of treatments, their costs, their toxicity, their availability, and the associated logistics are all potential obstacles to the success of treatment [1]. Globally in 2017, Morris et al [2], reported 458,000 new cases of MDR-TB, globally, with evidence of an increase in incidence each year.

According to the WHO, over the past decade, the number of MDR-TB cases in Europe has tripled among those already treated for tuberculosis and increased fivefold among newly diagnosed TB [3]. In India, the study by Polu Giri et al. [4] in 2019 showed resistance in 51.65% of patients observed. In Africa, in 2019 carried out by Nomonde R et al.[5] A study of monoresistance to Isoniazid and Rifampicin in areas with very high multidrug resistance found that 18,352 cases, or a frequency of 20.7%, developed resistance to Isoniazid. The same study showed that rifampicin monoresistance increased from 15.3% in 2011 to 21.4% in 2014, while isoniazid was borderline between 13.8% and 21.1%. In Ethiopia (2019), 17.3% of MDR-TB had treatment failure, while 16.8% had an unknown treatment outcome and the remainder had a favourable outcome [6]. Guinea is facing the emergence of forms of resistance to the major 1st line molecules rifampicin and isoniazid. The 1999 survey of resistance in the country reported a primary multi-resistance rate of 0.5% and an acquired resistance rate of 51.59% [7]. The diagnosis of multidrug-resistant tuberculosis has made a lot of progress in recent years with the acquisition of Gen-Xpert devices in all administrative regions. Thus, the number of cases of multidrug-resistant tuberculosis detected increased from 17 in 2006 to 178 in 2016 and then from 219

cases in 2017 to 265 in 2018. [7]

Thus, the increase in the incidence of multi-drug resistance, the need to evaluate the effectiveness of the means undertaken in the fight against anti-tuberculosis drug resistance, we undertook this study to evaluate the detection and evolution of MDR-TB in Guinea from 2016 to 2019.

Methodology

• Study Type

This was a retrospective cohort study of data from multidrug-resistant tuberculosis patients followed in four care sites between January 2016 and December 31, 2019.

• Study framework

Guinea is a West African country with a population of about 13 million people[14]. It is one of the middle-income countries with the majority (65%) of the population living in rural areas[14]. The health context has been impacted by the following factors: the Covid-19 pandemic that has been raging since 2020, several epidemics including the Ebola virus disease epidemic declared in early 2014 and the change of political regime that occurred in September 2021. These factors have had a negative impact on the overall health situation in the country[15]. The incidence of tuberculosis has not improved, rather it has increased between 2016 and 2021, from 176 to 179/100,000 inhabitants. DOTS coverage of the country began in 1990. By 2024, there are fourteen (14) sites for the management of TBMR. The country has had a National Reference Laboratory for Mycobacteria (NRML) that has been operational since 1996. He performs the rapid diagnostic test (Xpert MTB /RIF, LPA), cultures and antibiograms. Diagnosis of TBMR cases (12) east provided by the CDTs with the Xpert device, the regional laboratories and the NMRL. All confirmed patients are treated within 24 hours in a centre closer to their residence. The most widely used treatment regimen since 2016 is the short regimen of 09 to 11 months with regular clinical and bacteriological follow-up. This treatment

included an intensive phase of at least 4 months with administration of: moxifloxacin (Mfx), kanamycin (Km)/amikacin, clofazimine (Cfz), prothionamide (Pto), pyrazinamide (Z), ethambutol (E) and high-dose isoniazid (Hh), and a 5-month maintenance phase with Mfx, Cfz, Z and E.

Since 2021 we have switched to the fully oral regimen with an initial treatment phase: 4-6 bedaquilline (Bdq), Pto, -Hh-Cfz-Mfx-E-Z and a maintenance phase: 5 Mfx-Cfz-E-Z (4). The present study was carried out in four sites with a large cohort of TBMR patients, which are the pneumo-phthisiology department of the Ignace Deen National Hospital and the outpatient tuberculosis centers of the quarry, Tombolia and Macenta located respectively in the communes of Kaloum, Matam, Matoto and in a region of the country (Nzérékoré Region). They are responsible for diagnosing and treating cases of tuberculosis, including multidrug-resistant forms in Guinea. But the anti-tuberculosis center for outpatient care in Tombolia is supported by a Belgian NGO called “Damien Action” which provides a particular context for the follow-up of patients in this center (nutritional support and transport costs for patients, continuous capacity building and an incentive bonus for health personnel, regular implementation and monitoring of care registers).

• Population

This study involved all TBMR patients diagnosed and treated at the study sites between 2016 and 2022, regardless of age, gender, and provenance for which information on treatment outcome was available.

• Data collection

This study analyzed MDR-TB patient data from the National Anti-Tuberculosis Program (PNLAT) Guinea database. The data collected were:

- Socio-demographic **data** (Age in completed year, Sex, occupation), location of tuberculosis (extra-pulmonary, lymph node and pulmonary), **History of TB of patients** (2nd line drug already received), Serology (HIV), Cotimoxazol intake, Rifampicin resistance.
- Data on the outcome **of the treatment:**

- Cure: 3 or more cultures performed at least 30 days apart were negative,
- Treatment completed: treatment completed but no record indicating that 3 or more consecutive cultures taken ≥ 30 days apart are negative after the intensive phase,
- Death: a patient who dies for any reason during treatment,
- Treatment failure: discontinuation of treatment or need for a change of at least two anti-tuberculosis drugs due to: lack of conversion at the end of the intensive phase, or bacteriological reversion in the maintenance phase after conversion to negative, or evidence of additional resistance to fluoroquinolones or second-line injectable drugs, or adverse drug reactions.
- Lost to follow-up: a patient whose treatment has been interrupted for two consecutive months or more.
- Not assessed: A patient for whom no treatment outcome is assigned, this includes cases that are “transferred” to another treatment unit and whose treatment outcome is unknown.
- Therapeutic success: Corresponds to cured patients and patients who have completed their treatment.

• Data analysis

All analyses were performed at bilateral alpha 5% risk using R software.

Qualitative variables were described by their number and proportion (percentage).

Quantitative variables by their mean and standard deviation. The chi-square or exact Kruskal-Wallis-Fisher test was used as indicated to assess associations. Then a multivariate analysis of significance at 0.05 at 95% confidence intervals was performed.

Ethics: Ethical approval was sought and obtained under number 112/CNERS/23 from the National Ethics Committee for Health Research of Guinea, prior to the start of data collection and patient data was used anonymously.

Results

We observed an increase in the number of MDR-TB cases from 137 (19%) in 2016 to 225 cases (30%) in 2019 (Figure 1).

The population with MDR-TB was young, with a mean age of 30 ± 24.4 years and a predominance of men (71%). Workers and the unemployed were the most represented, at 32% and 31% respectively. The majority of cases were reported to the quarry CAT (34%) and the Tombolia CDT (33%). The pulmonary location was the most predominant (99%). Second-line treatment was used in 2.3% of patients. Retroviral serology was positive in 21% of patients (Table I).

Evaluation of treatment showed that 35% of patients were cured and 16% died (Table II).

Table III presents the data of the univariate analysis of treatment success according to the evolution of multidrug-resistant tuberculosis and the characteristics of patients in Guinea from 2016 to 2019, it allowed to observe a significant difference between the results of notification by center ($p_value < 0.001$), the result of retroviral serology ($p_value < 0.001$), the use of ARVs ($p_value = 0.001$), the initiation of the patient on cotrimoxazol ($p_value = 0.003$) and there was also a gradual decrease in the time to treatment ($p_value < 0.001$). The treatment success rate, which differed from one centre to another ($p_value < 0.001$), was associated with retroviral serology ($p_value < 0.001$), ARV use ($p_value = 0.001$) and initiation of the patient on Cotrimoxazol ($p_value < 0.001$). In the 2017 multivariate analysis ($p_value = 0.034$), management at the Tombolia CDT ($p_value < 0.001$) and retroviral serology positivity was statistically associated with treatment success.

Table IV presents the results of the multivariate analysis of treatment success according to the evolution of multidrug-resistant tuberculosis and the characteristics of patients in Guinea from 2016 to 2019, it observed a significant difference between the results of the years and the treatment center, 2017 ($P = 0.034$), CS of Tombolia ($P < 0.001$) and HIV infection ($P = 0.019$).

Table I: characteristics of MRBT patients in Guinea from 2016 to 2019 (N=740)

	Actual	%
Average age and extremes	30 (24, 40)	
Sex		
Feminine	215	29
Masculine	525	71
Profession		
Private civil servant	5	0,7
No	294	40
Professional	355	48
Public Servant	86	12
Treatment Center		
Career	248	34
Ignace Deen	193	26
Macenta	57	7,7
Tombolia	242	33
Localization		
Extrapulmonary	4	0 ,5
Pulmonary	736	99
Patient Type		
New	144	19
Reprocessing	596	81
ATCD 2nd line treatment		
No	733	97,7
Yes	17	2,3
Serology (HIV)		
Unknown	31	4,2
Negative	551	74
Positive	158	21
Taking ARVs		
No	612	83
Yes	128	17
Taking Cotrimoxazole		
No	605	81,8
Yes	135	18,2

Table II: Evaluation of the treatment of TBMR patients in Guinea from 2016 to 2019 (N=740)

	Actual	%
Treatment Result	684	
Death	110	16
Failed	10	1,5
Cured	241	35
No rating yet	52	7,6
Lost from sight	74	11
Processing completed	192	29
Therapeutic success	684	
No	246	36
Yes	438	64

Table III: Univariate analysis of treatment success according to the evolution of TBMR and Characteristics of patients in Guinea from 2016 to 2019

	Unsuccessfully, N = 2461	Success, N = 4381	P-value2
Age	32 (25, 40)	30(24,39%)	0.10
Sex			0.3
Feminine	80 (33%)	123 (28%)	
Masculine	166 (67%)	315 (72%)	
Profession			0.11
Private civil servant	2 (0.8%)	1 (0,2%)	
No	95 (39%)	188 (43%)	
Professional	125 (51%)	190 (43%)	
Public Servant	24 (9.8%)	59 (13%)	
Treatment Center			<0.001
Career	99 (40%)	127 (29%)	
Ignace Deen	78 (32%)	102 (23%)	
Macenta	13 (5.3%)	43 (9,8%)	
Tombolia	56 (23%)	166 (38%)	
Localization			0.14
Extrapulmonary	3 (1,2%)	1 (0,2%)	
Pulmonary	243 (99%)	437 (100%)	
Patient Type			0.13
New	54 (22%)	74 (17%)	
Reprocessing	192 (78%)	364 (83%)	
ATCD 2nd line treatment			0.060
No	232 (96%)	407 (99%)	
Yes	10 (4.1%)	6 (1.5%)	
Serology (HIV)			<0.001
Unknown	4 (1.6%)	26 (5.9%)	
Negative	166 (67%)	341 (78%)	
Positive	76 (31%)	71 (16%)	

Taking ARVs			<0.001
No	185 (75%)	377 (86%)	
Yes	61 (25%)	61 (14%)	
Taking Cotrimoxazole			0.003
No	177 (75%)	356 (85%)	
Yes	60 (25%)	65 (15%)	
Processing time	2 (1, 6)	2 (1, 5)	>0.9

¹ Statistics presented: n (%); Median (IQR)

² Statistical tests performed: chi-square test of independence; Wilcoxon rank-sum test; Fisher's exact test

Table IV: Multivariate analysis of treatment success according to the evolution of multidrug-resistant tuberculosis and Patient characteristics in Guinea from 2016 to 2019

	OR1	95% CI1	p_value
Year			
2016	—	—	
2017	0.54	0.31, 0.95	0.034
2018	0.99	0.56, 1.73	>0.9
2019	0.57	0.32, 1.00	0.051
Age	0.99	0.97, 1.00	0.062
Sex			
Feminine	—	—	
Masculine	1.11	0.75, 1.63	0.6
Treatment Center			
Career	—	—	
Ignace Deen	1.20	0.78, 1.86	0.4
Tombolia	2.62	1.70, 4.09	<0.001
Serology (HIV)			
Negative	—	—	
Positive	0.17	0.04, 0.70	0.019
Taking ARVs			
No	—	—	
Yes	1.12	0.42, 3.07	0.8
Taking Cotrimoxazole			
No	—	—	
Yes	2.63	0.81, 10.3	0.13
Processing time	1.00	0.99, 1.01	0.8

¹ OR = Odds Ratio, CI = Confidence Interval

Discussion

We note a gradual increase in the number of MDR-TB cases during the 4 years. This increase could be due to improved diagnostic means, in particular the increase in access to GeneXpert in the post-Ebola period. As noted by the WHO, on the susceptibility of people between 25 and 44 years of age to MDR-TB infection [8]. In our series we found an average age of 30 ± 12.8 years with similar observations made by other authors in Africa, particularly in Togo[9] and on the ground floor [10] who reported a predominance of young subjects. We noted a high representativeness of the male subjects, this result would be justified by the fact that the burden of disease related to tuberculosis in general is much higher in men than in women [11]. A similar observation to ours has been cited several times in the literature in sub-Saharan Africa [9,12,13]. Almost all MDR-TB (99.9%) was of pulmonary localization. This result demonstrates the rarity of extrapulmonary involvement in multidrug-resistant tuberculosis. The rarity of extrapulmonary involvement in MDR-TB is thought to be due to the low bacillary load in these patients [14]. Retroviral serology was positive in 21% of cases, but a much lower proportion was reported in the DRC by Nguen et al.[10] of which 2.3% were HIV-positive among MDR-TB patients. Due to immunosuppression, HIV-positive patients are at risk of developing MDR-TB and dying from it [15] This is why the WHO considers tuberculosis and HIV to be a deadly association, each accelerating the evolution of the other [11].

In our series, a large proportion of the patients had a history. Indeed, poorly followed treatment would increase the risk of resistance occurring, as reported in the study by Mdivani et al[16] which have shown that taking a TB drug in the history increases the risk of resistance by 1.77 times and the risk of MDR-TB by 5 times, as well as in that of Arevalo et al[17] who reported that the risk of MDR-TB disease increases the risk by 28.2 times when taking previous therapy. In addition, to study the association of MDR-TB with previous treatments, it is important

to know the outcome of treatment, especially cases of non-compliance (interruption or irregular use of treatment). Inadequate treatment can lead to a selection of resistant mutants and subsequently to monoresistance. By the same mechanism, the production of new mutations in a population will eventually lead to the emergence of a multi-resistant strain [15,18]. The evaluation of the treatment showed us that 35% of the patients were cured while 16% died. Our proportion is close to that of M'Barek et al reported that cure was reported in 30.3% of MDR-TB patients, but lower than that of Abderrahim et al.[19] who rated 44.4% cure, 3 deaths among XDR-TB patients, as well as Adambounou et al.[9] reported 72.7% of recoveries and 22.7% of deaths. Treatment success was associated with the treatment center, retroviral serology, ARV and Cotrimoxazol. These factors may vary from one study to another M'Barek et al.[20] found that treatment success was correlated with male sex ($p_value = 0.01$), the benefit of financial support for treatment by the WHO ($p_value < 0.001$), absence of smoking ($p_value = 0.01$), no history of tuberculosis ($p_value = 0.02$), new cases not previously treated ($p_value = 0.01$), treatment compliance ($p_value < 0.01$).

Conclusion

MDR-TB is a serious threat in our context. This series reported a gradual increase in the number of MDR-TB cases from 2016 to 2019, with high mortality and a non-negligible treatment failure rate. We observed a difference in the notification rates of the centres during this period, Factors associated with treatment success were treatment centre, retroviral serology, ARV use, Cotrimoxazol intake and time to treatment. The replicability of the actions of the Tombolia center could improve the management of MDR/TB in Guinea.

Abbreviations

MDR-TB: Multidrug-resistant tuberculosis;
WHO: World Health Organization;

Financing

This study is funded by the SORT-IT programme (WHO/TDR).

Thanks

We thank the SORT-IT (WHO/TDR) program for allowing us to carry out this study. We would also like to thank our teachers from the Faculty of Health Sciences and Techniques of the University of Conakry (FSTS), the Center for Research and Training in Infectious Diseases of Guinea (CERFIG) and the African Center of Excellence for the Prevention and Control of Communicable Diseases (ECA-PCMT) for the quality of the supervision. Gratitude and recognition to our masters Dr. Sidikiba Sidibé, Professor Abdoulaye Touré, Professor Alexandre Delamou, Professor Alioune Camara and Professor Mohamed Cissé.

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Available online : September 11, 2025

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Conflict of interest : None

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To cite this article

OH Diallo, AS Magassouba, T Bangoura, S Hassane-Harouna, BD Diallo, AB Nabe et al. Treatment outcomes for multidrug-resistant tuberculosis in Guinea: a retrospective cohort study from 2016 to 2019. *Jaccr Infectiology* 2025; 7(3): 1-10

<https://doi.org/10.70065/2573.jaccrInfect.001L011109>



Original article

Knowledge, attitudes and practices of pregnant women in the face of sexually transmitted infections at the CSRef of Commune III of the Bamako Health District

Connaissance, attitudes et pratiques des femmes enceintes face aux infections sexuellement transmissibles au CSRef de la commune III du district sanitaire de Bamako

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Résumé

Introduction : Les infections sexuellement transmissibles (IST) sont des infections qui peuvent se transmettre d'une personne à une autre par voie sexuelle. L'objectif de cette étude était de décrire les connaissances, les attitudes et pratiques des femmes enceintes face aux IST de la Commune III du District de Bamako face aux IST.

Méthodologie : Notre étude s'est déroulée au Centre de santé de référence (CSRef) de la Commune III du District de Bamako. Il s'agissait d'une étude transversale à visée descriptive qui s'est déroulée du 1er au 31 Mars 2022, soit une période d'un mois. Ont été incluses dans notre étude les femmes enceintes vues en consultation prénatale (CPN) durant la période, résidant en Commune III et qui ont accepté de participer à l'étude.

Résultats : Nous avons colligé 196 femmes enceintes. La tranche d'âge 26 à 40 ans était la plus représentée avec 49%. La majorité des femmes enceintes étaient mariées, soit 91% des cas. La majorité des femmes enceintes connaissaient les voies de transmissions des IST, soit 71% des cas. Les femmes ayant déjà utilisé un préservatif étaient les plus représentées avec 62% des cas. La majorité des femmes enceintes avaient déjà eu de 1 à 4 partenaires sexuels dans leurs vies, soit 75% des cas. Dans 78% des cas, les femmes enceintes qui ont des partenaires sexuels occasionnels utilisaient du préservatif au cours des rapports sexuels.

Conclusion : Bien que les méthodes de protection étaient connues par plus de la moitié des enquêtées, nous avons tout de même remarqué des insuffisances au niveau des pratiques et comportements sexuels à risques qui restent à améliorer.

Mots-clés : Connaissance, attitudes, pratiques, femmes enceintes, IST.

Abstract

Introduction: Sexually transmitted infections (STIs) are infections that can be transmitted from one person to another sexually. The objective of this study was to describe the knowledge, attitudes and practices of pregnant women in the face of STIs in Commune III of the District of Bamako in the face of STIs.

Methodology: Our study took place at the Reference Health Center (CSRef) of Commune III of the District of Bamako. It was a cross-sectional descriptive study that took place from March 1 to 31, 2022, a period of one month. Pregnant women seen in prenatal consultations (ANCs) during the period, residing in Commune III and who agreed to participate in the study, were included in our study.

Results: We collected 196 pregnant women. The 26 to 40 age group was the most represented with 49%. The majority of pregnant women were married, i.e. 91% of cases. The majority of pregnant women were aware of the routes of transmission of STIs, i.e. 71% of cases. Women who had already used a condom were the most represented with 62% of cases. The majority of pregnant women had already had 1 to 4 sexual partners in their lives, i.e. 75% of cases. In 78% of cases, pregnant women who have casual sexual partners used condoms during sexual intercourse.

Conclusion: Although the methods of protection were known by more than half of the respondents, we nevertheless noticed inadequacies in terms of risky sexual practices and behaviours that still need to be improved.

Keywords: Knowledge, attitudes, practices, pregnant women, STIs.

Introduction

Sexually transmitted infections are infections that can be transmitted from one person to another sexually. The World Health Organization (WHO) estimates that

more than one million sexually transmitted infections are contracted every day worldwide, with an increase in the number of etiological agents and an increasing trend in the severity of asymptomatic diseases in the majority of cases (1). It is estimated that 374 million people contract one of four STIs each year: chlamydia, gonorrhea, syphilis or trichomonas. It is estimated that more than 500 million people aged 15 to 49 have genital infection with the herpes simplex virus (HSV) (2). Human papillomavirus (HPV) infection was responsible for 570,000 cases of cervical cancer in 2018, and causes more than 311,000 cervical cancer-related deaths each year (3). It is estimated that nearly one million pregnant women were infected with syphilis in 2016, resulting in more than 350,000 adverse birth outcomes, including 200,000 stillbirths and neonatal deaths (4).

In Africa, according to the World Health Organization (WHO) report, it is estimated that each year, 357 million people contract one of the following four (4) STIs: *Trichomonas vaginalis* (143 million), chlamydia (131 million), gonorrhea (78 million) and syphilis (5.6 million). More than 500 million people are living with an infection with the Human Papillomavirus (HSV) herpes (5). At any given time, about 291 million women have an HPV infection, one of the most common STIs. Beyond all these problems, pregnant women remain the most vulnerable target and the most affected by STIs. In resource-poor countries, about 240,000 women die early each year from STI-related cervical cancer (3). According to many authors, the development of the HIV pandemic is a question of behaviour, knowledge and information (6).

In Mali, various studies show that STIs are a public health problem. The rate of STIs among women and men aged 15-49 who had sex varied between regions in 2018. This percentage was respectively among (women-men) in the regions of: Kayes (12.5-4.2); Koulikoro (16.5-2.7); Sikasso (6.7-1.7); Ségou (12.8-2.5); Mopti (10.3-0.9); Timbuktu (8.8-1.2); Gao (12.8-1.1); Kidal (1.7-0.4); Bamako (22.4-3.7) (7).

At the level of the reference health center of Commune III (CSRef) of Bamako, according to routine data

that are entered into a District Health Management Software (DHIS)2, in 2020, they recorded 479 cases of STIs in men and 167 cases in women, as well as in relation to HIV, 111 cases in men and 182 in women according to the health information system of commune III (SIS CIII). Hence this study at the level of the CSREF of Commune III in order to minimize the impact of this pandemic on this layer of the population. These data are of paramount importance for three reasons: their magnitude, their potential for serious complications and their links to HIV/AIDS. In order to contribute to the fight against STIs, given the frequency and few studies on STIs and especially among pregnant women, we decided to describe the knowledge, attitudes and practices of pregnant women in Commune III of the District of Bamako with regard to STIs.

Methodology

Our study took place at the CSRef of Commune III of the District of Bamako. It was a cross-sectional descriptive study that took place from March 1 to 31, 2022, a period of one month.

Pregnant women seen in prenatal consultations (ANCs) during the period, residing in Commune III and who agreed to participate in the study, were included in our study. Women who did not live in Commune III and those who did not agree to participate in the study even if they lived in Commune III were not included in this study.

The data was captured and analyzed with IBM SPSS 25 software. The graphs were made with Excel 2019.

Results

We collected 196 pregnant women, the 26 to 40 age group was the most represented with 49% (Figure 1). The mean age was 32 years with extremes at 26 and 42 years. The majority of pregnant women were married, i.e. 91% of cases. The primary level was the most represented with 36% of cases.

In 87% of cases, pregnant women had knowledge

about STIs, i.e. 171 women (Table 1). The health centre was the most cited source of information with 56% of cases (Figure 2). The majority of pregnant women were aware of the routes of transmission of STIs, i.e. 71% of cases. Fidelity was the most cited means of prevention with 51% of cases.

Women who had already used a condom were the most represented with 62% of cases. Women who had their first sex between the ages of 16-21 were 61%. The majority of pregnant women had already had 1 to 4 sexual partners in their lives, i.e. 75% of cases. Eighteen pregnant women had casual sexual partners, or 9% of cases. In 78% of cases, pregnant women who have casual sexual partners used condoms during sexual intercourse (Figure 3).

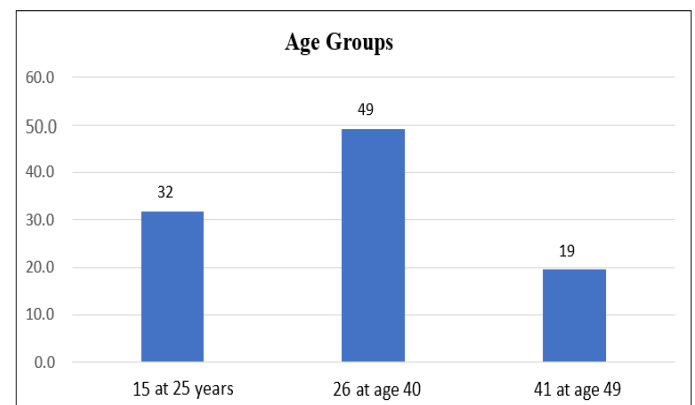


Figure 1: Representation of pregnant women by age group

Table I: Distribution of pregnant women according to knowledge of the types of STIs

STI Types	Actual	Percentage
Gonorrhea	109	64
HIV/AIDS	146	85
Hepatitis B	78	46
Herpes	34	20
Syphilis	55	32
Chlamydia	18	11
Other	12	7

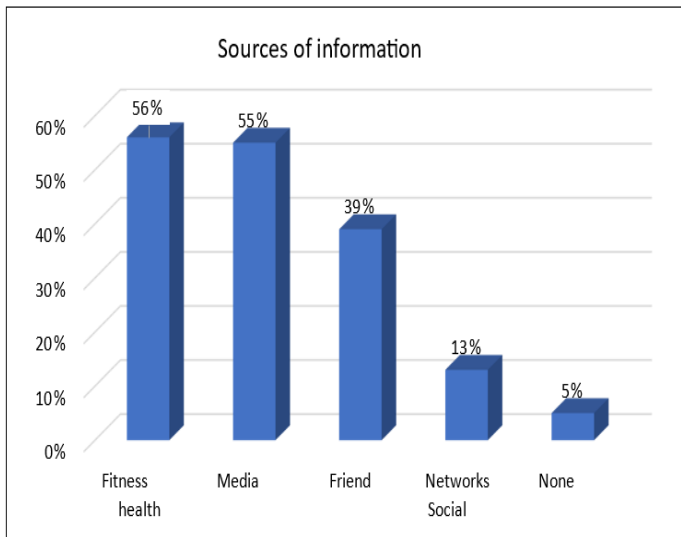


Figure 2: Representation of pregnant women by source of information

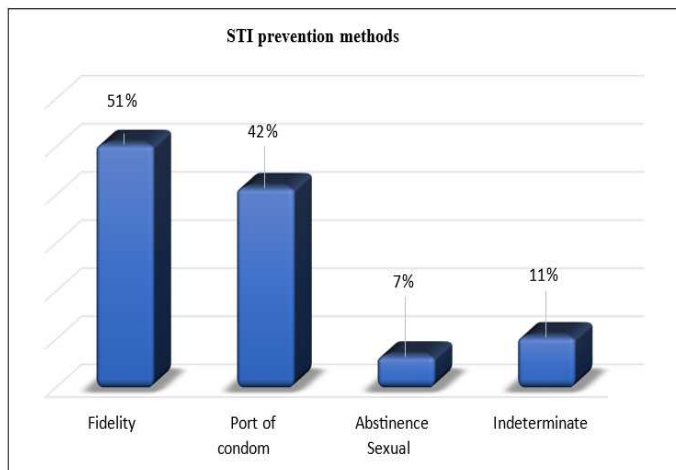


Figure 3: Representation of pregnant women according to the means of STI prevention

Discussion

In our series, the 26 to 40 age group was the most represented with 49%. The mean age was 28.4 years with extremes of 26 and 42 years. Our data are closer to those of TOURE F (14) who found in his study an age between 14 and 34 years with 92% of cases. Our mean age was comparable to that of Kureychy MM (8) who reported that most pregnant women were young and had an average age of 26.5 years. This predominance of young women was also reported by the EDSM-VI (9) in 2018, where women aged 20 to 39 were the most represented in 65% of cases.

In our study, the majority of pregnant women were married, i.e. 91% of cases. These results were comparable to those reported by TOURE F (14) for which the proportion of married pregnant women was 89.6% of cases. Our rate is higher than that of the EDSM-VI (9), which found 80% of married women in its sample. This representation of married women emerges in the study conducted by Thiam D (15) in Dakar and O. Pambou in Brazzaville, which made the same observation (16).

In view of the results, the primary level was the most represented level of education with 36% of cases. Our rate was lower than that of TRAORE H in 1991 (17) who found 56% of pregnant women with a primary level, DIALLO R (22) made the same observation in his study with a massive representation of pregnant women with a primary level. Our results were lower than those of TOURE F (14) whose sample was 52% of pregnant women with a primary level.

According to the data from our survey, the majority of pregnant women, 87%, have already heard of sexually transmitted infections. Our results were higher than those of the study conducted by Sidibé AS at the CSRéf-CV in 2015 (10) from which 53% claimed to know about STIs, as well as those obtained by Aimé A (18) on the sexual behavior of young people in family breakdown in Abidjan with 71% of people having knowledge about STIs. Our rate was almost identical to that of TOURE F (14); of all the pregnant women interviewed during our study, 86% had at least one STD. Our data were different from that of Kondé A (19) whose main sources of information cited by the students were the media with (90%); friends with 51%; talk/Internet with 41%; school with 20%. In the study by Tatientse A M T (11), the main sources of information on STIs and HIV/AIDS among students were television (24%) and radio (23%); talk with classmates with 22%; faculty courses with 20%. Berthe B's results (9) were similar to those found by the two previous studies, namely media representation. The same observation was reported in a study carried out in Dakar by Fofana O et al. (12). During our study, the avoidance of sexually transmitted infections was

cited as the main reason for condom use in 60% of cases. Our data were higher than those of Kouma M (20) who in her study reported only 19% condom use, as well as that of Kondé A (19) whose sample reported condom use.

Conclusion

STIs remain a public health problem whose prevention requires awareness and compliance with certain measures, although the methods of protection were known by more than half of the respondents, we nevertheless noticed inadequacies in terms of risky sexual practices and behaviours which remain a challenge to be met. The lack of information about STIs from pregnant women can make them a risk group and facilitate the transmission of STIs to their newborns, which could lead to negative consequences. Improved knowledge, attitudes and practices and correct management could likely reduce the prevalence of STIs.

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Available online : September 11, 2025

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9 : Commune VI Reference Health Centre

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Conflict of interest : None

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To cite this article

M Sidibé, D Coulibaly, S Diallo, MB Coulibaly, I Sidibé, M Diabaté et al. Knowledge, attitudes and practices of pregnant women in the face of sexually transmitted infections at the CSRef of Commune III of the Bamako Health District. *Jacccr Infectiology* 2025; 7(3): 11-16

<https://doi.org/10.70065/2573.jacccrInfect.002L011109>



Cas clinique

Infections nosocomiales à bactéries multirésistantes en orthopédie-traumatologie chez deux patients : quelle attitude, quels résultats ?

Nosocomial infections due to multidrug-resistant bacteria in orthopedic trauma patients:
what approach, what outcomes?

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Résumé

But : Rapporter l'expérience de la prise en charge de deux patients souffrant d'infection associée aux soins (IAS) causées par des bactéries multirésistantes (BMR) dans un contexte de ressources limitées en orthopédie-traumatologie au Centre Hospitalier Universitaire Régional de Ouahigouya.

Cas clinique : Deux patients victimes d'accident de la circulation routière chez qui une amputation transfémorale a été réalisée et qui ont contracté une infection à diverses souches d'*Enterobacter cloacae* multi résistantes productrices de BLSE ; de carbapénemases, résistantes aux aminosides. Le manque de moyens financiers a limité les explorations et l'antibiothérapie ciblée chez le premier patient. Une monoantibiothérapie ciblée avec du cotrimoxazole à forte dose a été instituée pendant 6 semaines chez le deuxième patient. Un traitement symptomatique,

une surveillance ; des débridements itératifs, une cicatrisation dirigée et une suture secondaire ont été réalisés, permettant la guérison des patients.

Conclusion : Les IAS causées par des BMR, en particulier après chirurgie des membres, représentent un défi clinique majeur. Les antibiotiques nécessaires sont peu disponibles et coûteux dans notre pratique. Le manque de moyens financiers nous a imposé une attitude médicamenteuse minimaliste qui a du coup permis d'éviter une escalade thérapeutique incontrôlable. L'évolution des patients a été favorable.

Mots-clés : IAS, BMR, *Enterobacter cloacae*, chirurgie.

Abstract

Objective: To report on the experience of treating two patients with healthcare-associated infections (HAIs) caused by multidrug-resistant bacteria (MDR) in

a resource-limited orthopedic trauma setting at the Ouahigouya Regional Teaching Hospital Center.

Clinical case: Two patients who were victims of road traffic accidents underwent transfemoral amputation and contracted infections with various strains of multidrug-resistant *Enterobacter cloacae* producing ESBL, carbapenemases, and resistant to aminoglycosides. Lack of financial resources limited investigations and targeted antibiotic therapy in the first patient. Targeted monotherapy with high-dose cotrimoxazole was instituted for 6 weeks in the second patient. Symptomatic treatment, monitoring, repeated debridement, guided healing, and secondary suturing were performed, allowing the patients to recover.

Conclusion: HAIs caused by MRBs, particularly after limb surgery, represent a major clinical challenge. The necessary antibiotics are scarce and expensive in our practice. The lack of financial resources forced us to adopt a minimalist approach to medication, which in turn prevented an uncontrollable escalation of treatment. The patients' progress was favorable.

Keywords: HAI, MRB, *Enterobacter cloacae*, surgery.

Introduction

Une infection nosocomiale est une infection associée aux soins (IAS) acquise dans un établissement de soins [1]. Les bactéries multirésistantes (BMR) sont définies comme des souches pathogènes résistantes à au moins trois classes d'antibiotiques simultanément et comprennent le *Staphylococcus aureus* résistant à la méthicilline (SARM), *Escherichia coli* producteur de β -lactamases à spectre étendu (BLSE), *Klebsiella pneumoniae* producteur de BLSE, *Acinetobacter baumannii* multirésistant (ABMR), *Pseudomonas aeruginosa* multirésistant (PAMR), *Enterococcus* et *Enterobacter* [2-4]. La résistance aux antimicrobiens pose un véritable problème de santé publique. Selon l'Organisation Mondiale de la Santé (OMS), lors de l'Assemblée Générale des Nations Unies en 2024, « La résistance aux antimicrobiens menace d'annuler

un siècle de progrès médicaux. Elle pourrait nous ramener à l'ère pré-antibiotiques et des infections aujourd'hui traitables s'apparenteraient alors à des condamnations à mort » [5]. Elle a publié en plus une liste des pathogènes prioritaires dont certaines sont à action critique comportant les Entérobactérales résistantes aux céphalosporines de troisième génération et celles résistantes aux carbapénèmes [6]. En orthopédie-traumatologie la prise en charge des IAS causées par les BMR est coûteuse, difficile et longue car les patients ont une durée d'hospitalisation significativement plus longue et un pronostic nettement plus défavorable [2,3,7,8]. Le but de cette série de cas est de rapporter l'expérience de la prise en charge de deux patients souffrant d'IAS causées par des BMR dans un contexte de ressources limitées au Centre Hospitalier Régional de Ouahigouya afin d'enrichir la littérature.

Cas cliniques

Cas n°1

Il s'est agi d'un patient de 54 ans sans ATCD particuliers, victime d'un traumatisme ouvert du genou gauche secondairement compliqué de gangrène mixte de la jambe. Le traitement a consisté en une amputation transfémorale gauche à moignon ouvert. L'évolution a été marquée sur le plan général par une fièvre intermittente avec des clochers thermiques à 40 degrés Celsius, une pression artérielle et une saturation périphérique en oxygène normales. Localement on notait une nécrose musculaire du moignon d'amputation associée à un écoulement purulent. Les prélèvements pour examen cyto bactériologique (ECB) ont isolé *Enterobacter cloacae* productrice de carbapénémase, résistante acquise aux aminosides (GTN) et uniquement sensible à la fosfomycine et à l'amikacine. On notait une leucocytose à 23 G/L à l'hémogramme. Le bilan de terrain et le reste du bilan infectieux et inflammatoire n'ont pas été réalisés faute de moyens financiers. Il a été réalisé un débridement de la plaie au bloc suivi de soins locaux quotidiens à l'hypochlorite de sodium et d'un

traitement antipyrétique adjuvant. Les ordonnances d'antibiotiques prescrites n'ont pas été honorées par le patient par manque de ressources financières. L'évolution a été marquée par une apyrexie au bout de 10 jours et un début de cicatrisation au bout de 2 mois. La figure 1 illustre les étapes évolutives du moignon avec en A) la suppuration du moignon d'amputation transfémorale gauche, en B) une vue peropératoire lors de la nécrosectomie et en C) l'évolution à deux mois.



Figure 1 : Photographies illustrant les étapes évolutives du moignon d'amputation : (A) suppuration du moignon d'amputation ; (B) Aspect peropératoire lors de la nécrosectomie ; (C) Aspect à deux mois d'évolution.

Cas n°2

Il s'agit de l'observation d'un patient de 46 ans tabagique, victime d'un accident de la circulation routière au décours duquel il a présenté un écrasement de la jambe gauche. En urgence il a été réalisé une amputation transfémorale d'hémostase. L'évolution a été marquée par une fièvre intermittente avec des clochers thermiques à 40 degrés Celsius. Sur le plan local on notait au septième jour, une désunion cicatricielle, une nécrose et un écoulement louche malodorant pour lequel un prélèvement pour examen cytobactériologique (ECB) a été fait. Deux souches d'*Enterobacter cloacae* productrices de bêta-lactamases à spectre élargi (BLSE), avec résistance acquise aux aminosides (GTN) ont été isolées. Elles étaient sensibles à la fosfomycine, à l'amikacine, au cotrimoxazole, aux phénicolés et aux carbapénèmes.

On notait une leucocytose à 20 G/L à l'hémogramme. Le bilan de terrain et le reste du bilan infectieux et inflammatoire n'ont pas été réalisés faute de moyens financiers. Il a été réalisé une ablation des points de suture et des débridements itératifs au bloc. Devant les difficultés financières, un traitement par cotrimoxazole comprimé 960 mg à raison de 1 comprimé chaque 12 heures a été institué pour six semaines en plus d'un traitement antipyrétique adjuvant et une surveillance. L'évolution a été marquée par une apyrexie au bout de sept jours et un arrêt de la suppuration locale. La cicatrisation s'est faite au bout de six semaines après une suture secondaire de la plaie. La figure 2 illustre les étapes évolutives avec en D) la nécrose du moignon d'amputation transfémorale gauche, en E) une vue peropératoire lors de la nécrosectomie, en F) l'aspect après suture secondaire à 21 jours et en G) l'aspect à six semaines.



Figure 2 : Photographies montrant les aspects évolutifs du moignon : (A) nécrose du moignon d'amputation transfémorale gauche ; (B) Aspect au cours du débridement ; (C) aspect après suture secondaire ; (G) aspect à six semaines.

Discussion

Nous avons rencontré des difficultés en rapport avec la non exhaustivité des explorations paracliniques notamment les examens biologiques spécifiques pour

mieux caractériser la résistance aux antimicrobiens. L'émergence des bactéries multirésistantes en milieu de soins est une réalité de nos jours en Afrique subsaharienne [9].

En Europe, les bacilles à Gram négatif représentent 60 % des infections nosocomiales, avec une prédominance des Enterobacterales, tandis que les staphylocoques sont responsables d'environ 15 % des infections et les streptocoques environ 10 % [10]. En Chine, les BMR incriminées en chirurgie orthopédique par ordre de fréquence étaient *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae* et *Enterobacter cloacae* et les membres pelviens étaient les plus concernés par ces infections à BMR [11]. En Afrique, les données sur la résistance aux antibiotiques indiquent une augmentation de la prévalence des souches de staphylocoques résistants à la méticilline (SARM) et des bacilles à Gram négatifs, notamment les entérobactéries productrices de bêta-lactamases à spectre élargi et de carbapénémases [9]. Le taux de mortalité en Afrique subsaharienne lié à la résistance aux antimicrobiens est estimé à 27,3 décès par an pour 100 000 habitants [12]. Giannitsioti et al [13] notaient dans une étude multicentrique sur les infections postopératoires de membres pelviens à BMR, que le traitement combinant antibiothérapie ciblée et de multiples chirurgies permettait la guérison chez la moitié des patients infectés. Le traitement qui devrait faire appel à des antibiotiques de réserve, peu disponibles et coûteux dans notre pratique [9], la mise en isolement et les débridements chirurgicaux n'ont pas été correctement mis en œuvre faute de moyens financiers. Les traitements mis en œuvre l'ont été grâce au soutien de l'action sociale. Le traitement symptomatique, la surveillance et les débridements itératifs ont permis d'obtenir la guérison du patient du cas 1. Pour le patient du cas 2, une monoantibiothérapie ciblée a été associée permettant sa guérison. La prise en charge multidisciplinaire associant infectiologues, bactériologues, réanimateurs et autres collègues a permis une prise en charge diligente malgré les obstacles.

Conclusion

Les infections associées aux soins (IAS) causées par les bactéries multirésistantes (BMR), en particulier après chirurgie des membres, représentent un défi clinique majeur. Les Entérobactéries notamment *Enterobacter cloacae* productrices de bêta-lactamase à spectre élargi (BLSE) ou résistantes aux carbapénèmes et aux aminosides ont été isolées. Les antibiotiques nécessaires sont peu disponibles et coûteux dans notre pratique. Le traitement symptomatique, la surveillance et les débridements itératifs ont permis d'obtenir la guérison pour un patient. Pour le second patient, une monoantibiothérapie ciblée a été associée permettant sa guérison. Le manque de moyens financiers nous a imposé une attitude médicamenteuse minimaliste qui a du coup permis d'éviter une escalade thérapeutique incontrôlable.

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Conflit d'intérêt : Aucun

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Pour citer cet article

A Ouangre, S Ouedraogo, C Sompougou, AN Sarr, D Denne, ND Bado et al. Infections nosocomiales à bactéries multirésistantes en orthopédie-traumatologie chez deux patients : quelle attitude, quels résultats ? *Jaccr Infectiology* 2025; 7(3): 17-21

<https://doi.org/10.70065/2573.jaccrInfect.003L011109>



Clinical case

**Mediastinopulmonary histoplasmosis in immunocompetent subjects:
about 2 cases of *Histoplasma duboisii* infection in Bouaké (Côte d'Ivoire)**

Histoplasmosse médiastino-pulmonaire chez des sujets immunocompétents :
à propos de 2 cas d'infection à *Histoplasma duboisii* à Bouaké (Côte d'Ivoire)

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I Gué³, JC Anon¹, V Achi¹

Résumé

Les auteurs rapportent deux cas de pneumopathie à *Histoplasma duboisii* chez deux patients immunocompétents. La fréquence sous-estimée de cette maladie et la non spécificité des signes radio-cliniques respiratoires font que les praticiens y pensent peu. Les diagnostics étaient tardifs car l'affection était prise pour d'autres affections plus fréquentes comme la tuberculose ou les pneumopathies bactériennes trainantes. Les praticiens devraient y penser lorsque les examens pour rechercher la tuberculose ne sont pas positifs et devant l'absence d'amélioration clinique et radiologique malgré des traitements antibiotiques ou antituberculeux instaurés en première intention. L'exploration des lésions cutanées souvent associés notamment les ganglions, facilitait le diagnostic.
Mots-clés : *Histoplasma duboisii*, Pneumonite, Tuberculose, Antibiotiques.

Abstract

The authors report two cases of *Histoplasma duboisii* pneumonitis in two immunocompetent patients. The underestimated frequency of this disease and the non-specificity of the respiratory radioclinical signs mean that practitioners think little about it. Diagnoses were late because the disease was mistaken for other more frequent diseases such as tuberculosis or trailing bacterial lung diseases. Practitioners should consider this when tests for tuberculosis are not positive and when there is no clinical and radiological improvement despite antibiotic or anti-tuberculosis treatments initiated as a first-line treatment. The exploration of skin lesions, often associated, particularly the lymph nodes, facilitated the diagnosis.

Keywords: *Histoplasma duboisii*, Pneumonitis, Tuberculosis, Antibiotics

Introduction

Histoplasmosis is a deep fungal infection caused by dimorphic fungi. There are 2 types of histoplasmosis: *Histoplasma Capsulatum* var. *capsulatum* is the most common and fearsome form. It is endemic in Central and South America, Asia, Oceania and intertropical and southern Africa (1-3). This form is responsible for pneumonia and disseminated involvement in immunocompromised subjects, especially those immunocompromised by the Human Immunodeficiency Virus (HIV) (1,2,4).

Histoplasmosis at *Histoplasma capsulatum* var. *duboisii* that interests us in this work is the rare form, found only on the African continent and more frequently in West Africa, where our country, Ivory Coast, is located (2,5-7). The natural biotope of this species seems to be poorly known. The main route of contamination of this form seems to be airborne, however transcutaneous contamination has also been described (2,3). The inhaled spore takes the form of a large yeast 8 µm to 15 µm long that multiplies in the cell. *Histoplasma Capsulum* var. *duboisii* disseminates lymphatic and often leads to lesions that are often localized to skin tissues (ulcerations, nodules, papules, cold abscesses), lymph nodes (adenitis) or osteoarticular tissues (1,8). Mediastinopulmonary involvement and disseminated forms are rare (1,3,5). These lung disorders can be acute or chronic. The clinical and radiological manifestations are non-specific and polymorphic, especially in our context where other pulmonary infections by tuberculosis bacilli and other bacteria are predominant, making the diagnosis less obvious (3,4,8). Diagnostic certainty can be provided by direct examination after MGG staining or in the fresh state of samples (pus, serosities, bronchial secretions, BAL, biopsy) or lymph node appositions which reveal yeasts of 10-15 µm with double walls, hourglass “8” shaped contour (fine base of budding implantation) or a “giant cell” granuloma with plasmodia containing large rounded

or oval yeasts in an intrahistiocytic position histology (1,2,9-11). Medical treatment is based on antifungals, including amphotericin B, ketoconazole, imidazole derivatives, and itraconazole (1,2,9,12). The prognosis of pulmonary histoplasmosis depends on the quality and precocity of treatment (13). In this article, the authors report two cases of pulmonary histoplasmosis caused by *Histoplasma capsulum* var. *duboisii*, seen in the pulmonology department of Bouaké (Ivory Coast). The objective of this work was to show the possibility of severe cases of *Histoplasma duboisii* pneumonia in immunocompetent subjects and to get practitioners to think about it in the presence of acute or chronic diffuse pneumonia.

Clinical cases

Case n°1

Ms. SM, 48, a fish trader and former farmer, lives in Béoumi, a town located in central Côte d’Ivoire. She had consulted for a chronic cough associated with an alteration in her general condition. On anamnesis, the symptoms had been evolving for more than 36 months with an initially dry cough without a precise schedule and without triggering factors which had become productive by bringing back muco-purulent, non-fetid sputum, without hemoptysis. A month after the onset of the disease, a right chest pain, of moderate intensity aggravated by coughing, had been associated. These symptoms progressed in a context of unquantified intermittent fever, asthenia, anorexia, progressive weight loss of about 4 kilograms and non-pregnancy amenorrhea. In the face of these symptoms, chest X-rays carried out in the health centres and at the Abobo tuberculosis centre would have objectified infiltrates and excavations throughout the right lung and the examination of the GenXpert of the sputum would not have detected mycobacteria of the tuberculosis complex. The patient had been treated as clinically diagnosed pulmonary tuberculosis with anti-tuberculosis drugs (3 tablets of the combination of

Rifampicin (R), Isoniazid (H), Pyrazinamide (Z), and Ethambutol (E) that the patient took every morning). The evolution, despite good compliance with this treatment, was marked by the worsening of the deterioration of the general condition, the persistence of cough and the appearance of lymphadenopathy above the clavicular and left axillary. The patient had no known medical history. She had made several trips to Mali a few months before the disease (outside Côte d'Ivoire) and had never visited bat caves. His surgical and family history were also unremarkable. The physical examination showed a weight of 47 kg with malnutrition (body mass index (BMI): 14.88 kg/m²). The WHO Performance Index (WHO PS) was 2. At the mucocutaneous level, there were umbilic papules disseminated throughout the body and a fluctuating, painless, inflammatory lymphadenopathy above the left clavicular (Figure 1). The pleuropulmonary examination had found crackling rattles on the left and a collapse of the right hemithorax. The examination of the cardiovascular, digestive, gynaecological-obstetric systems was normal. Chest CT found right parenchymal destruction with mediastinitis and compensatory hyperinflation of the left lung (Figure 2). Sputum examinations (cytobacteriological examination of sputum (ECBC), GeneXpert) were again negative and mycological examination of lymph node pus and urine revealed large yeasts in the shape of an 8 suggestive of the presence of *Histoplasma capsulatum duboisii*. Elsewhere, HIV serology was negative, fasting blood glucose was 0.97 g/l, C Reactive Protein (CRP) was 96 mg/l. Microcytic anaemia was noted at 9.8 g/d and transaminases were normal. The patient was treated with itraconazole 200 mg, first orally 3 times/day for 3 days, then 2 times/day for 4 months. The clinical course was marked by regression of clinical symptoms and good tolerability of treatment.



Figure 1: Pus frank from the puncture of the axillary lymph node for which microbiological examination had revealed *Histoplasma capsulatum var duboisii*.

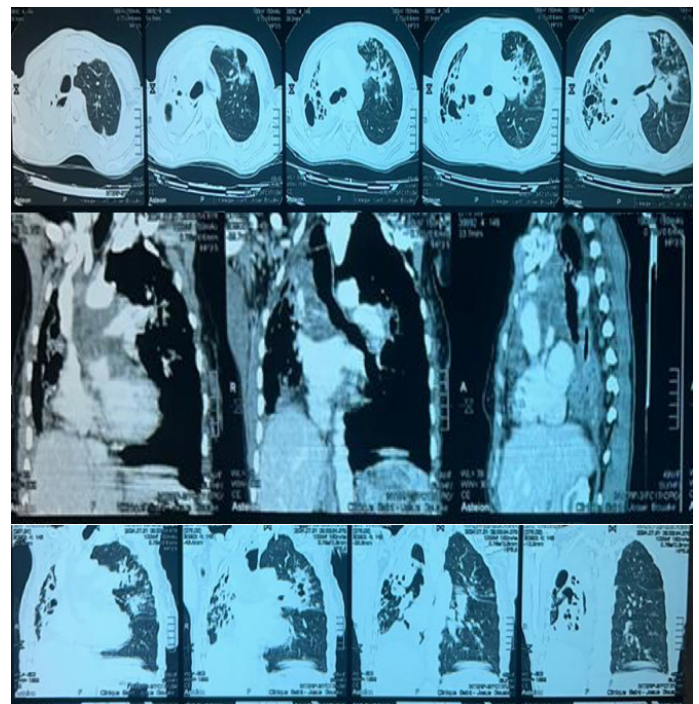


Figure 2: Chest CT scan of the SM patient (case 1) showing right parenchymal destruction with mediastinitis and compensatory hyperinflation of the left lung.

Case n°2

Two months after case 1, we hospitalized Mr. K S, 23 years old, looking for work and living in Soubré for a deterioration in his general condition associated with a chronic dry cough.

The disease had been evolving for about 16 months, with night-night fever without chills, asthenia, anorexia, and progressive unquantified weight loss. Despite the antimalarial and antibiotic treatments received, the course was marked by the appearance of pustules that were initially located on the anterior side of the thorax and had generalized to the entire upper part of the body (the face, thorax, scalp and fingers). About 7 months after the onset of the disease, despite several treatments, a dry cough, significant weight loss, hypoaesthesia and motor deficit of the lower limbs were associated. The patient had no known medical history. He had never made a trip outside the Ivory Coast and had never visited bat caves. His surgical and family history were also unremarkable. The physical examination had objectified a BMI of 16.26 kg/m², the temperature varied between 37.9 and 38.8°C and the WHO PS score was 4. The pleuropulmonary examination revealed pulmonary hypoventilation in the right hemithorax. At the mucocutaneous level, there were umbilic papules scattered throughout the body and a fluctuating mass of about 6 centimeters in diameter in the right latero-cervical region (Figure 3). Elsewhere, the examination revealed a fluctuating dorsal gibbosity including exploratory puncture to bring back frank pus, a syndrome of slow spinal cord compression with a lesional level in T4. Chest X-ray showed atelectasis of the right lung associated with a homogeneous mediastinal opacity with very limited external contours suggestive of mediastinal lymphadenopathy (Figure 4). The dorso-lumbar CT showed lysis of the vertebrae with bone sequestration and epiduritis, amputation on the medullary tract in T2-T8 and L2-L5. Serum protein electrophoresis and proteinuria were normal. GeneXpert on pus collected from the gibbosity did not detect mycobacteria of the tuberculosis complex. Mycological examination of the pus revealed large yeasts in the shape of 8 on direct examination, and culture isolated sources of *Histoplasma capsulatum* variant *duboisii*. The rest of the work-up found a negative HIV serology, a CRP of 93 mg/l, ALT of 25ui/l, AST of 115 (about 2 times

the normal value). Blood glucose, blood ionogram, uremia and serum creatinine were normal. Apart from microcytic anemia at 9 g/dl, the blood count appeared normal. On the 5th day of hospitalization, the patient had presented with sudden respiratory distress with a pulsed oxygen saturation of 57% which had led to the patient's death before the start of antifungal treatment.



Figure 3: (case 2) there were inverted papules scattered throughout the body and a fluctuating mass in the right latero-cervical region.

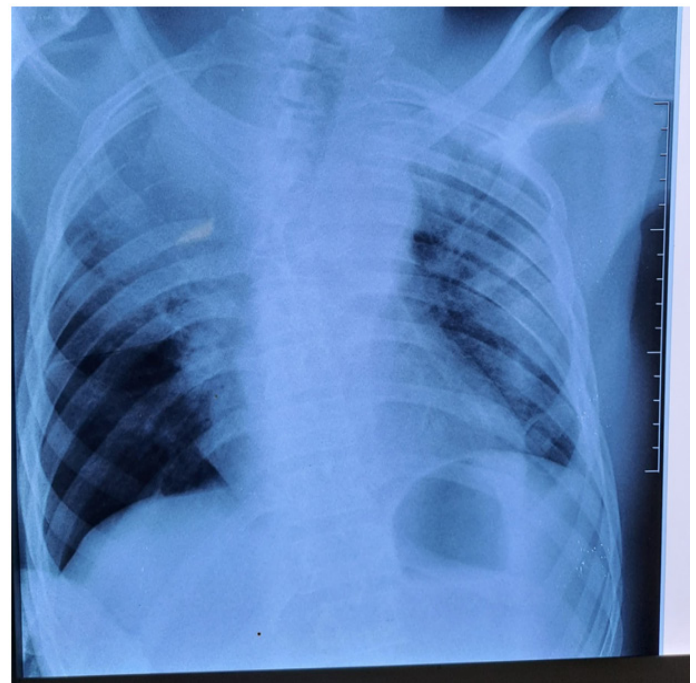


Figure 4: (case 2) the chest X-ray showed atelectasis of the right lung associated with a homogeneous mediastinal opacity with very limited external contours suggestive of mediastinal lymphadenopathy.

Discussion

Histoplasmosis is a deep mycosis caused by *Histoplasma capsulatum* of which there are two varieties: *Capsulatum* and *Duboisii*. The *Histoplasma capsulatum* var. *duboisii* is called African histoplasmosis because it was found only on this African continent, especially in intertropical Africa where it seemed to predominate in West Africa (1,2,5). According to Oladele et al, this disease appeared to be neglected and the prevalences described did not reflect the true magnitude. According to their study, there was an increase in the number of reported cases in Côte d'Ivoire and Mali (5). The patient presented in our first case was a shopkeeper and frequently travelled to these two countries. In Côte d'Ivoire, the first case of histoplasmosis was described about half a century ago, then other isolated cases were observed (6-8,14). Despite its endemicity, the true incidence of this disease is not known. A study that looked at autopsies performed on HIV patients who died in Côte d'Ivoire in 1998 found only 1.42% histoplasmosis (15)

Concerning the pathogenesis, *Histoplasma capsulatum* var. *duboisii* is responsible for lesions often localized to the lymph node or osteoarticular skin tissues (8). Unlike the *capsulatum* variety, its pathogenicity seems to be less linked to the existence of immunosuppression, in particular HIV infection (2, 16,17). The two patients we observed were HIV-free and had no history of illness. Authors had also described cases of histoplasmosis in *Histoplasma Duboisii* in immunocompetent subjects.

Mediastinopulmonary involvement and disseminated forms are rare, especially in immunocompetent subjects. African authors had described a few rare cases of visceral damage (14,16-18). Respiratory manifestations are polymorphic and nonspecific. In the two patients we presented, the symptoms were progressive with an insidious alteration of the general condition of the patients and a chronic cough that may be productive or dry, and radiological examinations had objected to images of infiltrates,

excavation, pulmonary destruction for the first case and mediastinohilar lymphadenopathy associated with atelectasis in the second patient. These clinical and radiological manifestations are also observed in other lung diseases including tuberculosis and sarcoidosis (4, 8). The high frequency of tuberculosis makes it the first diagnostic hypothesis put forward and often retained in the face of chronic respiratory diseases combining chronic cough, trailing fever and deterioration in general condition, even when diagnostic tests did not seem to contribute. In the literature, cases assimilated to mediastinopulmonary sarcoidosis have been described (19). In our cases, respiratory abnormalities were associated with bone lesions in the first patient (bone lysis involving the vertebrae with bone sequestration with epiduritis and skin lesions in both patients (umbilic papules disseminated throughout the body and fluctuating lymphadenopathy). These skin and bone lesions were frequently observed in African studies and seemed to be suggestive of histoplasmosis in *Histoplasma duboisii* (20, 21). They may precede or may occur after respiratory manifestations. Their presence could help practitioners in etiological research, but they were also non-specific, especially in a context where several infectious diseases are rampant. The diagnostic difficulties of mediastinopulmonary histoplasmosis are diverse. In addition to the clinical and radiological resemblance to other more frequent conditions, the diagnostic means that exist in our context are not routinely used. Diagnostic certainty could be provided by direct examination after MGG staining or in the fresh state of specimens (sputum, pus, serosities, bronchial secretions, BAL, biopsy) or lymph node appositions (1,2,9,10). Examinations of lymph node pus and urine had made it possible to obtain the diagnosis in both cases. Mycological examinations for sputum or bronchial secretions are not always prescribed because of the neglect of mycological pathologies in the profile of bacterial diseases, which are more frequent, but there was also the inadequacy of the technical platform in most of the country's health centers apart from regional or

university hospitals. Medical treatment is based on antifungals, including amphotericin B, ketoconazole, imidazole derivatives, and itraconazole. The prognosis usually seems good for isolated skin or lymph node sites, but lung damage can lead to disabling sequelae such as restrictive respiratory failure (2,12,13). A delay in care could cause the death of patients. According to authors, «factors associated with death during histoplasmosis caused by *Histoplasma* var *duboisii* were Performance Status ≥ 3 , altered mental status, dyspnea, CRP concentration ≥ 75 mg/L, hemoglobin level < 9 g/dL and/or platelet count < 100000 /mL, and interstitial infiltrate on chest X-ray» (13). Most of these factors were observed in our second patient who died. Other diseases such as pulmonary histoplasmosis should be considered when the respiratory signs are associated or the skin or lymph node lesions suggestive and if the tests for tuberculosis are negative in our context. Although the prevalence of this disease is low or unknown, Côte d'Ivoire remains an endemic area of this disease where cases can be observed in the different localities. By thinking about it early, we could improve the prognosis of this disease.

Conclusion

The underestimated frequency of *Histoplasma duboisii* pneumonitis and the non-specificity of respiratory radioclinical signs mean that practitioners think little about it. Practitioners should consider this when TB tests are not positive and when there is no clinical and radiological improvement despite antibiotic or anti-TB treatments.

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Conflict of interest : None

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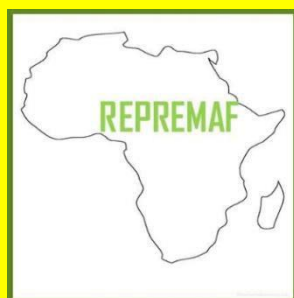
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To cite this article

IH Dje Bi, D Koné, Y Kpi, L Yéo, Y Toh Bi, R Dembélé et al. Mediastinopulmonary histoplasmosis in immunocompetent subjects: about 2 cases of *Histoplasma duboisii* infection in Bouaké (Côte d'Ivoire). *Jaccr Infectiology* 2025; 7(3): 22-28
<https://doi.org/10.70065/2573.jaccrInfect.004L011109>

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