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High HIV infection prevalence in a group of men who have sex with men (MSM)

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ABSTRACT

Objective: To evaluate, by phenotypic and genotypic parameters, the presence of virulence and resistance factors in clinical *Acinetobacter baumannii* strains and verify the correlation between these variables.

Settings: Observational study conducted in an University Hospital in Belo Horizonte, Brazil.
Methods: The confirmation of *A. baumannii*-calcoaceticus complex was performed by blaOXA51 detection, through the polymerase chain reaction (PCR) multiplex, as well as to investigate the presence of other oxacillinases (blaOXA23, 24, 58). Different PCR were performed for blaOXA143, blaVIM-1, csuE, ompA and for the insertion element ISAbA1 research. The antimicrobial and metalobetalactamases (MβL) expression were evaluated by Etest[®] method. Genetic diversity among the strains was done by ERIC-PCR. Biofilm evaluation was performed on polystyrene microplate and classified into four categories according to the strains optical density average.

Results: 98.4% (61/62) of strains were resistant to meropenem, 71% (44/62) to ceftazidime and 61.3% (38/62) to ampicillin-sulbactam. In contrast, 98.4% were sensitive to polymyxin B, 67.7% to gentamicin and 48.4% to tigecycline. MβL production was detected in 95.2% of strains. The blaOXA51 gene was detected in all tested strains; blaVIM-1 in 83.9% and ISAbA1 in 90.3%. While, the csuE and ompA gene were present in 43.5% and 53.2% strains, respectively.

Conclusion: There was a possible correlation between strains resistant to gentamicin and those positive for ompA gene. As well as the csuE gene correlated positively with ISAbA1. These results reinforce the clinical relevance of nosocomial infection by *A. baumannii* and provide data on the molecular epidemiology and expression of resistance genes and virulence.

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Introduction

Despite the introduction of antiretroviral therapy since the 1990s in Brazil,^{1,2} the Acquired Immune Deficiency Syndrome (AIDS) remains one of the most serious public health problems.^{3–5} Brazilian studies have shown that a large proportion of individuals diagnosed with HIV still started treatment late.^{6–8} Szwarcwald et al. showed that the delay between infection and date of first CD4 count was 4.3 years.⁷

In 2014, it was estimated that 36.9 million people were living with HIV worldwide, 80% concentrated in just 20 countries, Brazil being one of them. Moreover, against the global downward trend in new HIV infections between 2000 and 2014, Brazil recorded an increase in new cases of HIV.⁹

In Brazil, the HIV incidence rate in 2013 among those aged 15 years and over was 29.4/100,000 population; it was higher among men (43.5/100,000) than women (15.9/100,000).⁷ Another study in MSM showed a high HIV incidence in two Brazilian cities ranging from 1.47% to 0.92% in 2013.¹⁰

The prevalence of HIV in the general population of Brazil was 0.4% in 2014. However, in specific subpopulations such rates were higher. Studies conducted between 2008 and 2009 found an HIV prevalence rate of 10.5% among men who had sex with men (MSM).¹¹ Other studies in Brazilian cities also showed HIV prevalence in MSM around 10% or higher.^{12,13} In the general population the AIDS prevalence remained stable less than 1% over the years characterizing Brazil as a country of a concentrated epidemic. This means that HIV/AIDS is spread mainly in specific populations at higher risk, with prevalence rates higher than 5% in these subpopulations.^{14–16}

The findings of a survey conducted in two Brazilian cities in 2013 showed that most of the new infections were in MSM, at about 40%.¹⁰ The increased risk of infection for HIV among MSM has been associated with sexual attitudes and behaviors like sex with casual partners, use of illicit drugs and alcohol during sex, receptive unprotected anal sex, sex role versatility among MSM, and use of the internet to find sexual partners.^{14,17–21} Given this background, in which MSM has been disproportionately affected by HIV infections, this study aimed to analyze the association between sociodemographic characteristics, sexual practices, and behaviors with HIV/AIDS in a sample of MSM residents in the city of Rio de Janeiro (RJ).

Material and methods

The study used primary data from a social network analysis research collected between June 2014 and September 2015 entitled “The use of social network analysis to study variables associated with HIV infection among MSM” held in the city of Rio de Janeiro. This study was submitted and approved by the Research Ethics Committee of the National School of Public Health, Fiocruz (ENSP/Fiocruz) and was funded by the Department of Public Health Control, Prevention and Monitoring of STDs, AIDs and Viral Hepatitis (DDAHV/SVS/MS) of the Ministry of Health in collaboration with the United Nations’ Office on Drugs and Crime (UNODC) and the State Health Secretary of Rio de Janeiro.

This was a cross-sectional study conducted in two Civil Society Organizations (OSC), and a Primary Health Unit located in the city of Rio de Janeiro. Inclusion criteria were: sexually active men aged 18 and over, who reported homosexual or bisexual behavior in the last six months, unaware of their HIV status or having the last HIV testing negative. The study used a convenience sampling. Study participants were recruited in two ways: (1) individuals participating in other activities of OSC or the Primary Health Care Unit on the day of testing were invited to participate; (2) active recruitment, in which individuals in MSM venues were invited to learn more about the research getting a card with the location and time of the study.

Data was collected online at the study locations by the use of an adapted structured questionnaire²² in the Survey Gizmo software. The questionnaire was self-administered and the participants filled it out in private offices. Sex was defined as any type of oral, vaginal or anal encounters, with or without ejaculation, involving two or more persons, regardless of the situation in which the sexual contact occurred or the type of relationship with the other person. Regular partners were defined as those with whom they have had sex and defined as an affair, dating, frequent meetings, wedding, or any kind of involvement. Casual partners were considered those who have had sex with no subsequent encounters or without establishing any commitment to the relationship. Anonymous partners were defined as those who have had sex without even knowing the person and not knowing how to find the person again. Protected sex was defined as those in which a condom was used in all or most (more than half) of their sex encounters.

Living situations were defined by stable housing, unstable housing or others. Living in his own house or living with their parents was considered stable housing. Unstable housing was defined when the person lived in a slum, group home, rented room, shelter, residential treatment facility, or was homeless. The other option grouped different answers to living situations in rented houses or apartments, friends’ houses or other forms of housing.

Participants received pre- and post-test counseling and had their blood and oral fluid collected for HIV rapid testing. Positive test results for oral fluid were sent for confirmatory testing at another OSC that performed the rapid diagnostic blood test. Participants who tested positive for HIV were referred to an HIV outpatient clinic.

The outcome variable was the result of the test for HIV (positive or negative) and the independent variables addressed these aspects: (a) social demographic characteristics: age (≤ 30 or >30 years old); race/self-declared skin color (white, black or mixed); education (middle school, high school, incomplete or complete higher education); marital status (single/separated or married) and living situation (stable or unstable housing or others); (b) history of STD and HIV testing; (c) sexual behavior: number of regular and casual partners in the last six months; condom usage; receptive and insertive anal intercourse; concurrency of sexual partners; anonymous sex in the first encounter, use of alcohol or illegal drugs; paying to have sexual intercourse; HIV-positive sexual partner; (d) self-assessment chances of acquiring HIV (score of 0–10, with 10 as more likely).

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