ISSN ON-LINE 2177-8264

ISSN 0103-4065

DST

Brazilian Journal of Sexually Transmitted Diseases

Volume 28 Nº 3 2016

www.dst.uff.br

Jornal Brasileiro de Doenças Sexualmente Transmissíveis

BJSTD
28 years publishing new scientific knowledge.

Official Organ of the Brazilian Society for Sexually Transmitted Diseases
Official Organ of the Latin American and Caribbean for Control of STDs
Official organ for Latin America Union Against International Sexually Transmitted Infections
Official Organ of the Sector Sexually Transmitted Diseases / MIP / CMB / Fluminense Federal University

VOLUME 28 Nº 3 2016

Contents

EDITORIAL

ARTICLES

LETTER TO THE EDITOR

EVENTS

Official Organ of the Brazilian Society for Sexually Transmitted Diseases

Av. Roberto Silveira, 123 - Niterói - RJ - Brazil
CEP: 24230-150 - Tel.: + 55 (21) 2710-1549
www.dstbrasil.org.br

Official Organ of the Latin American and Caribbean for Control of STDs

President: Patrícia J. Garcia (Peru)

DST - BJDST is the official organ
for Latin America
Union Against International
Sexually Transmitted Infections (IUSTI)

President:
David Lewis

Secretary General:
Janet D. Wilson

Filiado à
Associação Brasileira
de Editores Científicos
ABEC

Official Organ of the
Sector Sexually Transmitted
Diseases

MINISTÉRIO DA EDUCAÇÃO
UNIVERSIDADE FEDERAL FLUMINENSE
SETOR DE DOENÇAS SEXUALMENTE TRANSMISSÍVEIS

Outeiro de S. João Batista, s/nº
Campus do Valonguinho - Centro
Niterói - RJ - 24210-150 - Brazil
Tel.: +55 (21) 2629-2495 - 2629-2494
Fax: +55 (21) 2629-2507

E-mail: dst@dst.uff.br
www.dst.uff.br

Rector of UFF:
Sidney Mello

Vice-Rector:
Antonio Claudio Lucas da Nóbrega

Provost of Research, Post-Graduate and Innovation:
Roberto Kant

Chief of DST Sector:
Mauro Romero Leal Passos

Editora da UFF

Editora da Universidade Federal Fluminense

ABEU
Associação Brasileira
das Editoras Universitárias

Targeting and Distribution:

DST - Brazilian Journal of Sexually Transmitted Diseases is directed to members of SBDST, subscribers, libraries, reference centers, gynecologists, urologists, infectious disease specialists, dermatologists, clinicians, family health programs and entities with an agreement. It is quarterly with a circulation of 3,000 copies.

Exchange requested - Pode-se permuta
On prie l'échange - Se solicita ei caxzje
Mau bitet nu Austausch - Si prega lo escambo

All content of the whole collection since 1989 is available for free on the World Wide Web at www.dst.uff.br

INDEXING:
LILACS EXPRESS Latin American Literature in Health Sciences, The Library of Congress
WC – 140

Editorial

Will antibiotic resistance sign the return of urethral dilators?

Before the availability of antibiotics, chronic urethritis meant regular — not so effective and rather painful — urethral irrigations. Frequently, chronic urethritis was complicated by urethral strictures, restricting urine and sperm flow. The treatment for such strictures was its dilation under minimal analgesia but major pain (**Figure 1** and **2**). For some patients, urethral dilation was to be done on a regular basis. The arrival of antibiotics meant the calvary of those men was over, but now, the threat of antibiotic resistance is upon us.

First, *Neisseria gonorrhoeae* (NG) does not stop developing resistance to antibiotics. One by one, antibiotics that had been effective in killing it have now been rendered ineffective by the high ability of *Neisseria gonorrhoeae* to develop resistance — from sulfonamides to penicillins, then to tetracyclines to quinolones, and now to cephalosporins and macrolides. In Québec, province of our public lab, the results for antimicrobial susceptibility have been published, demonstrating up to 40% resistance for ciprofloxacin and 15% for azithromycin[1]. Still, rare cases of decreased susceptibility are observed, but not yet resistance for cefixime and ceftriaxone. There is a serious need of new antibiotics able to fight the decreased susceptibility to ceftriaxone and cefixime that is being seen more and more around the world. Older drugs or combination of drugs could help, but those drugs that could be used for gonorrhea are injectable, and the burden of care would be increased for the already stretched STI workforce. An effective vaccine for *Neisseria gonorrhoeae* is still expected. In the meantime, a small decrease in *Neisseria gonorrhoeae* might be seen in recipients of meningococcal vaccines. The meaning of this, on a large scale, remains to be evaluated.

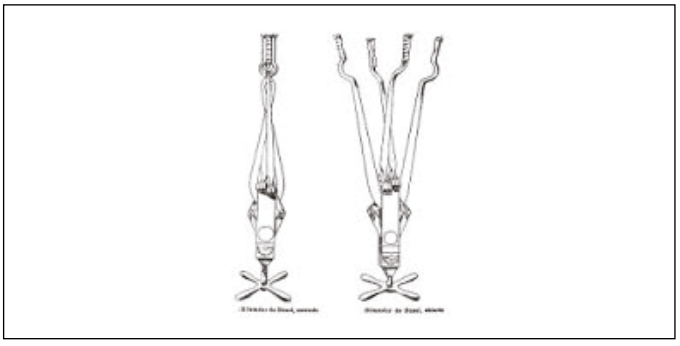

Figure 1 – Early 20th century uretral dilators.

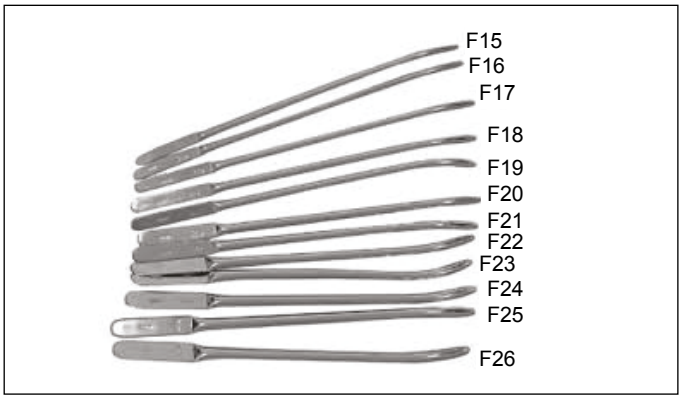

Figure 2 – Modern uretral dilators.

Second, there is the emergence of resistance from *Chlamydia trachomatis* (Ct) to azithromycin. Recently, a paper in STD journal by Kissinger[2] established that, in samples of men who have sex with women with Ct-related nongonococcal urethritis, the rate azithromycin treatment failure was between 6.2% and 12.8%. This range of failure is lower than the one previously published, but higher than the target chlamydia treatment failure rate of < 5% desired by the World Health Organization.

Third, there is the *Mycoplasma genitalium* rapid antimicrobial evolution. In a paper presented at the last CDC meeting in Atlanta, Chernesky and colleagues eloquently made the case by testing with Aptima test remnant specimens with an MG TMA test demonstrated an overall positivity rate of 8.1% with a 34.3% macrolide resistance rate. The majority of infections were in women infected with Ct and/or NG. Further studies are required to explore geographic differences in infection and macrolide resistance[3].

Until good STI prophylactic vaccines and new antibiotics are found, there will be difficult times, when only better antibiotic stewardship can push back the time when antimicrobial resistance signs the return of urethral dilators.

High-priority conditions are conditions for which clinicians commonly deviate from best practices for antibiotic prescribing and include situations in which antibiotics are overprescribed, underprescribed, or misprescribed — wrong antibiotic agent, dose, or duration[4]. Hindering aspects for prescribing antibiotics appropriately might include clinician's knowledge gaps about best practices and clinical practice guidelines, clinician's perception of patient expectations for antibiotics and/or their decreased satisfaction with clinical visits when antibiotics are not prescribed, and perceived pressure to see patients quickly. The Core Elements of Outpatient Antibiotic Stewardship are as follows:

- Commitment: demonstrating dedication to and accountability for optimizing antibiotic prescribing and patient safety;
- Action for policy and practice: implementing at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modifies it as needed;
- Tracking and reporting: monitoring antibiotic prescribing practices and offering regular feedback to clinicians,

or having clinicians assess their own antibiotic prescribing practices; and
- Education and expertise: providing educational resources to clinicians and patients on antibiotic prescribing, and ensuring access to needed expertise on optimizing antibiotic prescribing.

In the meantime, it is also fair to say the easiest case to treat will remain those which have not yet been acquired, due to the adhering to safer sexual practices!

MARC STEBEN, M.D.
STI unit, Institut National de Santé Publique du Québec
E-mail: marc.steben@cliniquea.ca

REFERENCES

1. Laboratoire de santé publique du Québec, Institut national de santé publique du Québec (to be published)
2. Kissinger PJ, White S, Manhart LE. Azithromycin treatment failure for chlamydia trachomatis among heterosexual men with nongonococcal urethritis. Sex Transm Dis. 2016;43(10):599-602.
3. Chernesky M, Jang D, Gilchrist J, Hoang L, Naidu P, Levett P et al. Mycoplasma genitalium (Mg) infections In Canadian women with chlamydia trachomatis (Ct) and/or neisseria gonorrhoeae (Ng) . Sex Transm Dis. 2016;43(Suppl 2):A41.
4. Centers for Disease Control and Prevention. Core elements of outpatient antibiotic stewardship. Recommendations and reports. November 11, 2016;65(6);1-12. Available from: <https://www.cdc.gov/mmwr/volumes/65/rr/rr6506a1.htm?s_cid=rr6506a1_e>. Access on: 29 nov. 2016.

Prevalence of dyslipidemias in antiretroviral therapy patients served in a specialized care service in Cuiabá (MT)

Prevalência de dislipidemias em pacientes em terapia antirretroviral atendidos em um serviço de assistência especializada em Cuiabá (MT)

Karoline Martins Moreira dos Santos[1], Shirley Ferreira Pereira[2]

ABSTRACT

Introduction: Although associated with improved quality of life for people with human immunodeficiency virus (HIV), the antiretroviral therapy (ART) has brought changes in cardiovascular manifestations. Antiretroviral therapy has been related with dyslipidemia, insulin resistance and diabetes mellitus, which constitute risk factors for cardiovascular disease. **Objective:** This study aimed at determining the prevalence of dyslipidemia in patients with HIV/acquired immunodeficiency syndrome (AIDS) treated at the specialized care center in Cuiabá (MT), according to the duration of treatment, the stage of the disease and the drug used for treatment. **Methods:** This is a retrospective study using data collected from medical records of adult patients of both sexes, positive for HIV/AIDS treated at the specialized care center in Cuiabá. To collect the data, we used an instrument consisting of demographic, personal, anthropometric and biochemical data. The biochemical tests analyzed the presence of abnormal total cholesterol (TC), total triglycerides (TG) and low-density lipoprotein (LDL). The stage of the disease was found in accordance with CD4. **Results:** A total of 124 patients were evaluated, of which 54.8% were male. The most prevalent age group (50.8%) was between 40 and 60 years old. Regarding education, 36.8% reported having incomplete higher education. In terms of marital status, 40.2% declared to be married. With respect to the time of exposure to antiretroviral therapy, there was a 44.2% prevalence of dyslipidemia in patients with 1.0 to 4.9 years of treatment. Concerning the stage of the disease, the prevalence of dyslipidemia was found in 53.4% of patients in the early stage (CD4≥500 cells/uL). However, there was progressive worsening of lipid profile with the advance of the disease. About the type of drug used, 29.3% of the patients in our study used the scheme "NNRTI + 2ITRN." **Conclusion:** The risk of dyslipidemia may increase with the time of treatment, the severity of the disease and the type of drug used in therapy.

Keywords: AIDS; antiretroviral agents; Dyslipidemias.

RESUMO

Introdução: Embora associada à melhoria da qualidade de vida dos portadores do vírus da imunodeficiência humana (HIV), a terapia antirretroviral (TARV) trouxe alterações nas manifestações cardiovasculares. A TARV tem sido relacionada à dislipidemia, à resistência à insulina e ao diabetes *mellitus*, que se constituem como fatores de risco para doença cardiovascular. **Objetivo:** Determinar a prevalência de dislipidemia em pacientes com HIV/síndrome de imunodeficiência adquirida (AIDS) atendidos no serviço de assistência especializada (SAE) de Cuiabá (MT), de acordo com o tempo de tratamento, o grau da doença e a droga utilizada no tratamento. **Métodos:** Trata-se de um estudo retrospectivo, por meio de dados coletados em prontuários de pacientes adultos, de ambos os sexos, portadores do HIV, acompanhados pelo SAE. Para coleta de dados informados, foi utilizado um instrumento composto de dados demográficos, pessoais, antropométricos e bioquímicos. Com base nos exames bioquímicos, foi analisada a presença de alterações de colesterol total (CT), triglicerídeos totais (TG) e lipoproteína de baixa densidade (LDL). O estágio da doença foi considerado conforme a contagem de células CD4. **Resultados:** Foram avaliados 124 indivíduos, sendo 54,8% do sexo masculino. A faixa etária mais prevalente (50,8%) esteve entre 40 e 60 anos. No tocante à escolaridade, 36,8% relataram ter ensino superior incompleto. Quanto ao estado civil, 40,2% declararam-se casados. Com relação ao tempo de exposição ao tratamento antirretroviral, observou-se 44,2% de prevalência de dislipidemia nos pacientes com 1,0 a 4,9 anos de tratamento. Quanto ao estágio da doença, foi verificada prevalência de 53,4% de dislipidemia nos pacientes no estágio inicial (CD4≥500 cells/μL), porém houve piora progressiva do perfil lipídico com o avançar da doença. Concernente ao tipo de droga utilizada, 29,3% dos pacientes de nosso estudo utilizam o esquema "ITRNN + 2ITRN". **Conclusão:** O risco de dislipidemias pode aumentar com o tempo de tratamento, com a gravidade da doença e com o tipo de droga utilizada na terapia.

Palavras-chave: AIDS; antirretrovirais; dislipidemias.

INTRODUCTION

The Acquired Immunodeficiency Syndrome (AIDS) represents one of the major health issues in our days, due to its pandemic aspect and severity. The history of this infection has been changing since 1996, especially in Western countries, with the implementation of the antiretroviral therapy (ART), which led to reduced rates of morbidity and mortality[1].

In Latin America, Brazil is the country that is most affected by AIDS in absolute numbers. The estimation is that 1.8 million people are living with the human immunodeficiency virus (HIV) in this region, and one third of them are in Brazil[2].

Data from the epidemiological journal AIDS/DST[3] show that, considering the regions of the country, from 1980 and June 2008 19,155 cases were notified in the North region (4%); 58,348 in the Northeast region (12%); 305,725 in the Southeast region (60%); 95,552 in the South region (19%); and 28,719 in the Center-West region.

Since the onset of the epidemic, the age group that has been most affected, in both genders, has been 20 to 39 years old, and that systematically represents more than 60% of the AIDS cases, accounting for about 70% of the total number of cases notified until June, 2000[4]. According to Dourado et al.[2], it is possible to observe more cases in the segments of society with lower schooling and worse socioeconomic status.

Brazil was one of the first developing countries to guarantee universal and free access to antiretroviral medication in the Unified Health System (SUS), after 1996[2].

[1]Multiprofessional Integrated Residency Program at Universidade Federal de Mato Grosso (UFMT) – Cuiabá (MT), Brazil.
[2]UFMT – Cuiabá (MT), Brazil.

Even though ART is associated with improved quality of life for people with HIV, it has caused changes in cardiovascular manifestations[5], due to the increasing number of cases of coronary syndrome and peripheral vascular events related both to the increased survival rates of the patients and to the toxicity of the therapy[6,7].

ART, and especially the class of protease inhibitors (PIs), has been associated with dyslipidemia, insulin resistance and diabetes mellitus, which constitute risk factors for cardiovascular conditions. According to some authors, the use of this class of drugs corresponds to 60% of the aforementioned metabolic changes[8].

Scientific evidence shows that the main risk factors for the development of metabolic abnormalities in people with HIV are: the duration of the treatment, the more advanced stages of the disease, and especially the use of some drugs, such as PIs[9].

Dyslipidemias are found in about 50 to 70% of the individuals undergoing PI therapy. Some studies have found serum triglyceride concentrations 7 to 15 times higher, and cholesterol concentrations 5 to 19 times higher than normal. Such an increase is associated with this drug[10].

According to the IV Brazilian Guideline on Dyslipidemia and Prevention of Atherosclerosis[11], dyslipidemia is characterized by increasing levels of low-density lipoprotein (LDL) (isolated hypercholesterolemia), reduced high-density lipoprotein (HDL), increasing levels of triglycerides (TG) (isolated hypertriglyceridemia) and increased values of LDL and TG (mixed hyperlipidemia). Hyperlipidemia affects more than 60% of the patients using ART, turning the increased cardiovascular risk into a major complication in the treatment for HIV infection[12].

Besides the adverse effects of antiretrovirals, especially with medications in the PI group, researchers believe that the chronic infection caused by HIV and other life habits that are common among people with HIV, such as smoking and sedentary lifestyle, contribute with the increased number of atherosclerotic diseases.

Considering the impact of the antirretroviral treatment on lipid profile, it is important to conduct a study to assess the presence of dyslipidemia induced by the use of this medication, in order to provide better clinical management of the patients with HIV.

OBJECTIVE

General Objective

To determine the prevalence of dyslipidemia in patients with AIDS assisted at the specialized care service (SAE) of Cuiabá (MT).

Specific objectives

- To characterize the patients according to sociodemographic variables;
- To determine the prevalence of dyslipidemia according to duration of treatment;
- To determine the prevalence of dyslipidemia according to the stage of the disease;
- To determine the prevalence of dyslipidemia according to the drug used in treatment.

METHODS

This is a retrospective study including data collected from medical records of adult patients, of both genders, with HIV, followed-up at a SAE in the city of Cuiabá from January 2011 to August 2012.

The study included patients aged more than 18 years old, of both genders, undergoing ART and whose lipid profile was followed-up in the 12 months prior to the appointment.

For the collection of the informed data, an instrument composed of demographic, personal, anthropometric and biochemical data was used.

Based on biochemical tests, there were changes in total cholesterol (TC), total triglycerides (TT) and LDL, as well as a relationship with sociodemographic variables, stage of the disease, duration of treatment and type of medication.

The analysis of blood lipids used the reference values for the diagnosis of dyslipidemias in adults aged more than 20 years old, according to the National Cholesterol Education Program (NCEP) Adult Treatment Panel (2001) (**Chart 1**).

The stage of the disease was considered according to the CD4 count, using the values established by the Center for Disease Control and Prevention (CDC)[13] (**Chart 2**).

Chart 1 – Reference values for the diagnosis of dyslipidemia among adults older than 20 years old.

Lipids	Values	Category
TC (mg/dL)	<200	Good
	200–239	Borderline
	≥240	High
LDL-C (mg/dL)	<100	Good
	100–129	Desirable
	130–159	Borderline
	160–189	High
	≥190	Very high
TG (mg/dL)	<150	Good
	150–200	Borderline
	201–499	High
	≥500	Very high

Source: III Brazilian Guideline on Dyslipidemia and Prevention of Atherosclerosis at the Department of Atherosclerosis of the Brazilian Society of Cardiology, 2001.
TC: total cholesterol; LDL-C: low-density lipoprotein; TG: total triglycerides.

Chart 2 – Classification of adults infected by the human immunodeficiency virus.

CD4 count	Stage of the disease
≥500 cells/μL	Early
200–499 cells/μL	Intermediate
<200 cells/μL	Final

Source: Centers for Disease Control and Prevention, 1992.
CD4: clusters of differentiation 4.

Statistical analysis was conducted with the software Epi Info, version 3.6. Prevalence rates were compared using the qui-square test, considering a 95% confidence interval.

The study was in accordance with the rules established by the National Health Council (CNS) resolution. 196/96. The Ethics Research Committee of the University Hospital Júlio Müller approved it, report n. 08197212.7.0000.5541. The patients presenting changes in lipid profile were assisted at the Nutrition Service of SAE in the follow-up period.

With the study results, the expectation was to characterize the profile of patients assisted at the service, leading to the creation of a set of actions that would generate an improved health status of the participants.

RESULTS AND DISCUSSION

This study evaluated 124 individuals, being 56 (45.2%) female and 68 (54.8%) male participants. This is in agreement with the average in Brazil, whose ratio is 1.7 new case affecting men for one case affecting women[14].

The most prevalent age group (50.8%) was 50 to 60 years old. The mean age of the patients involved in this study represents the cases of AIDS notified in Brazil, as demonstrated by the Epidemiological Journal AIDS – DST in 2011. It shows that the highest proportion (24.8%) of AIDS cases notified at the Notifiable Diseases Information System (Sinan), declared in the Mortality Information System (SIM) and registered at the Medication Logistics Control System and the Viral Load Laboratory Tests Control System (Siscel/Siclom) in 2010 was present in the age group of 40 to 49 years old, with increasing incidence rates in the age groups of 50 to 59 years old and older than 60 between 1998 and 2010[14].

In 2010, regarding the Center-West region, 31.0% of the total number of people notified in Sinan had incomplete elementary school (between the 5th and 8th grades); 19.1% had incomplete or complete high school, and only 8.6% had complete or incomplete higher education (5.5% - complete). In 28.4% of the cases, this data was ignored[14]. Even though the percentage of patients who had incomplete elemnetary school was similar, those who got to higher education was higher.

As to origin, we observed that the highest percentage of patients comes from other states. This fact can be explained because we analyzed a reference service, or because our city is inhabited by people coming from other locations. The sociodemographic characterization of the patients is presented in **Chart 3**.

High prevalence of hypercholesterolemia (34.4%) and hypertriglyceridemia (69.7%) was found in the patients of this analysis. These data are in accordance with those mentioned in the IV Brazilian Guideline on Dyslipidemia and Prevention of Atherosclerosis[15], which show that lipid abnormalities become more evident among people with HIV after the introduction of ART, and that hypercholesterolemia and hypertriglyceridemia are the most remarkable disorders.

Farhi et al.[16], in an investigation conducted with the objective of establishing the prevalence of dyslipidemia among adults of both genders with HIV, found a 44.7% prevalence of high blood TG. Hypercholesterolemia, which, in our study, was observed in 34.9% of the patients, is in accordance with the analysis by Leite & Sampaio[17], which found a 35.0% prevalence of this change in patients undergoing ART assisted at a SAE unit in the city of Rio de Janeiro.

Regarding the time of exposure to an antiretroviral treatment, the prevalence of dyslipidemia was higher among patients who had been undergoing treatment for 1.0 to 4.9 years (44.2% of the cases); 45.5% had "very high" triglycerides, 41.7% had "high" cholesterol, and 80.0% had "very high" LDL, as shown in **Table 1**. Similar results were found by Falcão et al.[18] in a cross-sectional study conducted in Pernambuco about cardiovascular disease and metabolic disorders in individuals with HIV. Of the 122 patients included in the study, 99 (81.1%) underwent ART with median and 3.3 years of therapy.

Farhi et al.[16] showed that the mean time of ART use was longer among patients with changes in blood lipids (66.4 months *versus* 53.0 months), and this variable was positively associated with dyslipidemia.

As to the stage of the disease, there was a reduced number of patients with normal lipids when the condition got worse; however, the prevalence of "high" or "very high" blood lipids was higher among patients at the early stage, showing the onset of dyslipidemia even when patients still have a low viral load. Possibly, with

Chart 3 – Sociodemographic characterization of patients assisted at the specialized care center of Cuiabá, Mato Grosso.

Variable	n	%
Sex		
Female	56	45.2
Male	68	54.8
Total	124	100.0
Age Group		
Up to 40	53	42.7
From 40 to 60	63	50.8
More than 60	08	6.5
Total	124	100.0
Schooling		
Incomplete elementary	37	31.6
Incomplete high school	26	22.2
Incomplete higher educat.	43	36.8
Complete higher educat.	11	9.4
Total	117	100.0
Marital Status		
Single	41	36.6
Married	45	40.2
Divorced	16	14.3
Widow(er)	10	8.9
Total	112	100.0
Origin		
Cuiabá–Várzea Grande	40	33.1
Countryside of Mato Grosso	39	32.2
Other states	42	34.7
Total	121	100.0

the evolution of the disease, other factors may interfere in blood biochemistry (**Table 2**). However, when considering the initial and final means of TG and TC (**Table 3**), there is a statistically significant difference between results. This change shows that both the duration of treatment and the stage of the disease can lead to worse lipid profile.

A cross-sectional study conducted by Godoi et al.[19], aiming at identifying the prevalence of atherosclerosis among individuals with HIV undergoing ART, showed that 84% of the patients evaluated had mean viral load of 670.6 (early stage). That is, when these patients present dyslipidemia (35.7% with hypercholesterolemia and 45.7% with hypertriglyceridemia) they are mostly clinically stable.

Table 1 – Prevalence of changes in blood lipids in relation to duration of treatment.

Blood Lipid	Duration Of Treatment						P value
	From 1.0 to 4.9 years		From 5.0 to 9.9 years		From 10.0 to 20.0 years		
	n	%	n	%	n	%	
TG							
Good	07	50.0	05	35.7	02	14.3	
Borderline	04	50.0	02	25.0	02	25.0	0.853
High	33	41.8	20	25.3	26	32.9	
Very high	05	45.5	02	18.2	04	36.4	
TC							
Good	14	36.8	10	26.3	14	36.8	0.430
Borderline	19	51.4	11	29.7	07	18.9	
High	15	41.7	08	22.2	13	36.1	
LDL							
Good	12	48.0	05	20.0	08	32.0	
Desirable	09	50.0	04	22.2	05	27.8	0.526
Borderline	10	47.6	06	28.6	05	23.8	
High	04	25.0	07	43.8	05	31.3	
Very high	04	80.0	0	0.0	01	20.0	

TG: total triglycerides; TC: total cholesterol; LDL: low-density lipoprotein.

Table 2 – Change in blood lipids of the patients analyzed according to the stage of the disease.

Blood Lipid	Stage of Disease						P value
	Early		Intermediate		Final		
	n	%	n	%	n	%	
TG							
Good	09	60.0	06	40.0	0	0.0	
Borderline	05	62.5	03	37.5	0	0.0	0.518
High	41	51.9	28	35.4	10	12.7	
Very high	07	53.8	06	46.2	0	0.0	
TC							
Good	18	47.4	14	36.8	06	15.8	0.350
Borderline	21	55.3	14	36.8	03	7.9	
High	23	59.0	15	38.5	01	2.6	
LDL							
Good	11	45.8	09	37.5	04	16.7	
Desirable	10	50.0	07	35.0	03	15.0	0.655
Borderline	14	63.6	08	36.4	0	0.0	
High	09	56.3	06	37.5	01	6.3	
Very high	04	66.7	02	33.3	0	0.0	

TG: total triglycerides; TC: total cholesterol; LDL: low-density lipoprotein.

Both the infection with HIV and ART may cause or aggravate dyslipidemia. The acknowledged hypertriglyceridemia associated with the progression of the retroviral infection probably constitutes the reflection of a chronic inflammatory state or a consequence of emaciation[12]. According to Safrin & Grunfeld *apud* Seidl & Machado[20], the lipodystrophy syndrome (dyslipidemia, abnormal fat redistribution, changes in glycemic metabolism and insulin resistance) in seropositive people for HIV is a progressive condition, whose severity seems to be directly proportional to time of treatment with antiretroviral medication.

Advanced age and low T CD4+ cell count, associated with the beginning of ART, seem to be related to its development. Metabolic disfunction can also depend on age and on the genetic context of the individual, as well as on other environmental factors or concomitant medication[12].

The benefit of a highly active antiretroviral therapy has been clearly demonstrated in patients with advanced symptomatic disease and in those who, despite being asymptomatic, presented severe immunodeficiency expressed in the T-CD4+ lymphocyte count, below 200/mm^3. Nowadays, in our country, there are four classes of antiretrovirals; they are more powerful, less toxic and with comfortable posology, so it is possible to take only one or two daily doses[21].

This treatment, whose history began with the use of monotherapy with zivozudine (AZT), from 1994 to 1996, is now consolidated by the double therapy as a therapeutic pattern, and, after 1996, by the triple therapy, introducing the PIs[22].

Antiretroviral drugs work by blocking the action of enzymes, which are important for the replication and function of the HIV. The drugs should be used in standardized combinations. Montherapy is not recommended, due to the unavoidable resistance to medication[23]. The action of each class of medication is exposed in **Chart 4**.

The initial therapy should always include three combined drugs: two nucleoside analog reverse transcriptase inhibitors (NtRTIs) associated with one non-nucleoside analog reverse transcriptase inhibitor (NNRTI) or with ritonavir-boosted PI (PI/r)[20]. This practice has been used in SAE, where 29.3% of the patients in our study use the scheme "NNRTI + 2NtRTI", and 22.8% use the scheme "NtRTI + PI", as shown in **Chart 5**.

According to Godoi et al.[19], among the antiretrovirals, PIs are more frequently associated with dyslipidemia and insulin resistance, even though medications from other classes, such as NtRTI and NNRTI, are present in metabolic disorders and in acute coronary events.

A major prospective and multinational study conducted with 17,852 patients registered the presence of hypercholesterolemia in 27% of the patients using PI, and 23% of those using NtRTI [24]. These findings corroborate the data in our study, in which the highest prevalence of dyslipidemia was found in patients using the scheme NNRTI + 2NtRTI.

Even if less frequently than observed with PIs, NNRTI and NtRTIs also produce hypertriglyceridemia and increase the levels of TC and LDL cholesterol fraction[12].

The mechanism in charge of inducing dyslipidemia among people with HIV is not completely clear yet. It is not clear if dyslipidemia occurs due to a direct effect of ART or if it is a result of the interaction between several factors, such as antiretroviral treatment, genetic predisposition, environmental factors like diet and physical activity, or other factors — possibly the response of the host to the HIV infection[25]. However, regardless of the causing mechanism, the presence of dyslipidemia always requires the attention of health professionals, especially the nutritionist, who is essential to prevent and control blood lipids using an adequate diet therapy.

Table 3 – Evolution of the mean value of blood lipids during treatment.

Blood lipids	n	Early	Final	P value
TG	114	209.7±122.2	297.6±170.2	0.0019
TC	111	196.2±50.6	219.3±42.9	0.0034
LDL	76	114.7±40.6	129.2±52.3	0.0630

TG: total triglycerides; TC: total cholesterol; LDL: low-density lipoprotein.

Chart 4 – Class of antirretroviral medication and its respective actions.

Class of medication	Action
Protease inhibitors	Act on protease, blocking its action and preventing the production of new copies of cells infected with HIV.
Nucleoside analog reverse transcriptase inhibitors	Act on reverse transcriptase, incorporating it to the DNA chain created by the virus. They make this chain defective, preventing the reproduction of the virus.
Non-nucleoside analog reverse transcriptase inhibitors	They block the action of the enzyme directly, as well as the multiplication of the virus.

Source: Brazil, 2013.
HIV: human immunodeficiency virus.

Chart 5 – Antiretroviral schemes used by patients assisted at the specialized care service, Cuiabá, Mato Grosso.

ART	Classification	%
EFZ, ABV	NNRTI + 2NtRTI	29.3
LPV/r, ABV	NtRTI + PI	22.8
ATV, RTV, ABV	PI + 2NtRTI	13.8
Others		34.1

ART: antirretroviral therapy; EFZ: Efavirenz; ABV: Abacavir; LPV/r: Lopinavir; ATV: Atazanavir; RTV: Ritonavir; NNRTI: non-nucleoside analog reverse transcriptase inhibitor; 2NtRTI: nucleoside analog reverse transcriptase inhibitors; NtRTI: nucleoside analog reverse transcriptase inhibitors; PI: protease inhibitor.

CONCLUSION

The use of antiretroviral therapy, which radically changed the treatment of patients infected with HIV, is associated with metabolic changes, such as dyslipidemia and insulin resistance, which constitute risk factors for the development of cardiovascular disease. The mechanism leading to dyslipidemia is not completely clear yet, so further ongoing studies are necessary.

Our investigation concluded that the risk of dyslipidemia increases with the duration of treatment, the severity of the disease and the type of drug used in therapy.

In order for the therapy not to cause any risk to the patient, changes in lifestyle, a balanced diet and physical activities should be implemented. The last resort for treatment would be pharmacological interventions.

It is also essential to raise awareness of the medical community for the increasing incidence of heart disease among patients with HIV undergoing antiretroviral therapy or not, once this incidence tends to grow because of the increasing life expectancy of infected patients.

Conflict of interest

The authors declare there is no conflict of interests in this paper.

REFERENCES

1. Teixeira Júnior MG, Issa A, Soares VE. Dislipidemia associada à terapia anti-retroviral. Rev SOCERJ. 2005;18(6):542-6.
2. Dourado I, Veras MASM, Barreira D, Brito AM. Tendências da epidemia de Aids no Brasil após a terapia anti-retroviral. Rev Saúde Públ. 2006;40:9-17.
3. Brasil. Ministério da Saúde. Semanas epidemiológicas de julho a dezembro de 2007 e de janeiro a junho de 2008. Boletim epidemiológico Aids, ano V, n. 1. Brasília: Ministério da Saúde; 2008.
4. Brito AM, Castilho EA, Szwarcwald CL. AIDS e infecção pelo HIV no Brasil: uma epidemia multifacetada. Rev Soc Bras Med Trop. 2001;34(2):207-17.
5. Hajjar LA, Calderado D, Yu PC, Giuliano I, Lima EMO, Barbaro G, et al. Manifestações cardiovasculares em pacientes com infecção pelo Vírus da Imunodeficiência Humana. Arq Bras Cardiol. 2005;85(5):363-77.
6. Milei JI, Grana D, Fernández Alonso G, Matturri L. Cardiac involvement in acquired immunodeficiency syndrome: a review to push action. Clin Cardiol. 1998;21(7):465-72.
7. Rerkpattanapipat PI, Wongpraparut N, Jacobs LE, Kotler MN. Cardiac manifestations of acquired immunodeficiency syndrome. Arch Intern Med. 2000;160(5):602-8.
8. Bitnun AI, Sochett E, Babyn P, Holowka S, Stephens D, Read S, et al. Serum lipids, glucose homeostasis and abdominal adipose tissue distribution in protease inhibitor-treated and naive HIV-infected children. AIDS. 2003;17(9):1319-27.
9. Leite LHM, Sampaio ABMM. Anormalidades metabólicas e sobrepeso em portadores de HIV/AIDS em terapia com anti-retrovirais. Rev Nutr. 2008;21(3):277-83.
10. Chen D, Misra A, Garg A. Clinical review 153: lipodystrophy in human immunodeficiency virus-infected patient. J Clin Endocrinol Metabol. 2002;87(11):4845-56.
11. Lima EMO, Bernoche CYSM, Caramelli B. III Diretrizes Brasileiras sobre Dislipidemias e Prevenção da Aterosclerose do Departamento de Aterosclerose da Sociedade Brasileira de Cardiologia. Arq Bras Cardiol. 2001;77(Suppl 3).
12. Raimundo P, Miranda A, Ribeiro J, Mansinho K. Risco cardiovascular em doentes com infecção por vírus da imunodeficiência humana. Acta Med Port. 2010;23(4):669-76.
13. Centers for Disease Control and Prevention. Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR Recommendations and Reports. 1992 Dec.
14. Brasil. Ministério da Saúde. Semanas epidemiológicas de julho a dezembro de 2010 e de janeiro a junho de 2011. Boletim epidemiológico Aids, ano VIII, n. 1. Brasília: Ministério da Saúde; 2012.
15. Sposito AC, Carameli B, Fonseca FAH, Bertolami MC. IV Diretrizes Brasileiras sobre Dislipidemias e Prevenção da Aterosclerose do Departamento de Aterosclerose da Sociedade Brasileira de Cardiologia. Arq Bras Cardiol. 2007;88(Suppl 1).
16. Farhi L, Lima DB, Cunha CB. Dislipidemia em pacientes HIV/AIDS em uso de anti-retrovirais num hospital universitário, Rio de Janeiro, Brasil. J Bras Patol Med Laborat. 2008;44(3):175-84.
17. Leite LHM, Sampaio ABMM. Risco cardiovascular: marcadores antropométricos, clínicos e dietéticos em indivíduos infectados pelo vírus HIV. Rev Nutr. 2011;24(1):79-88.
18. Falcão MCBA, Zírpole JC, Albuquerque VM, Markman Filho B, Araújo NAM, Falcão CA, et al. Associação dos biomarcadores com aterosclerose e risco para doença coronariana em portadores de HIV. Arq Bras Cardiol. 2012;99(5):971-8.
19. Godoi ETAM, Brandt CT, Godoi JTAM, Lacerda HR, Albuquerque VMG, Zirpoli JC, et al. Efeito da terapia antirretroviral e dos níveis de carga viral no complexo médio-intimal e no índice tornozelo-braço em pacientes infectados pelo HIV. J Vasc Bras. 2012;11(2):123-31.
20. Seidl EMF, Machado ACA. Bem-estar psicológico, enfrentamento e lipodistrofia em pessoas vivendo com Hiv/Aids. Psicol Estudo. 2008;13(2):239-47.
21. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Programa Nacional de DST e AIDS. Recomendações para Terapia Anti-retroviral em Adultos Infectados pelo HIV. Brasília: Ministério da Saúde; 2008.
22. Bonolo PF, Gomes RRFM, Guimaraes MDC. Adesão à terapia anti-retroviral (HIV/aids): fatores associados e medidas da adesão. Epidemiol Serv Saúde. 2007;16(4):267-78.
23. World Health Organization. TB/HIV: manual clínico. Terapia antiretroviral para o tratamento da infecção pelo HIV. cap. 2. 2ª ed. Geneva; 2004.
24. Abreu, et al. Tratamento anti-retroviral e hipercolesterolemia em população HIV positiva. Revista da SOCERJ. 2006;19(3):219-24.
25. Canuto MM, Morell EB, Rodero FG. Alteraciones lipídicas y riesgo cardiovascular asociado a la terapia antirretroviral. Enferm Infecc Microbiol Clín. 2006;24(10):637-48.

Corresponding address
KAROLINE MARTINS MOREIRA DOS SANTOS
SHIN, CA 2, Bloco F, Edifício Millenium Center, apartamento 629
Brasília (DF), Brasil
CEP: 71503-502
E-mail: karolinemartins1@hotmail.com

Received on: 08.19.2016
Approved on: 11.23.2016

Knowledge of Human Papillomavirus, cervical cancer, and anti-HPV vaccine among students from a university in Goiás, Brazil

Conhecimento dos acadêmicos de uma universidade de Goiás sobre a infecção pelo papilomavírus humano, câncer do colo do útero e vacina anti-HPV

Thairine Carrijo do Prado[1], Leonardo Luiz Borges[1], Vera Aparecida Saddi[1], Silvia Helena Rabelo dos Santos[2], Andrea Alves Ribeiro[1]

ABSTRACT

Introduction: Cervical cancer affects women worldwide. The etiological pathogen is the Human Papillomavirus (HPV). Despite the high incidence, there are some prevention programs that include Pap smear test and the anti-HPV vaccine. **Objective:** The objective of this study was to evaluate the perception and knowledge of HPV infection, cervical cancer, and anti-HPV vaccine among biomedicine students from the *Pontifícia Universidade Católica de Goiás* (PUC Goiás). **Methods:** A questionnaire was administered with objective questions in a multiple-choice format. The mean score for each group of questions was classified as follows: satisfactory, if above 80%; reasonable, between 70 and 80%; and unsatisfactory, when less than 70%. The data was transferred to the R Core Team 2012. In order to develop the statistical analysis, the chi-square test (χ^2) was applied, with a confidence interval of 95% and a significant value below 0.05. **Results:** From 268 participants, the scores concerning the HPV infection varied from 23,2 to 99,6%, with an average of 75,7%; with regard to cervical cancer, scores ranged from 25,9 to 98,1% with an average of 68,9%; and regarding the anti-HPV vaccine, scores ranged from 14,3 to 97,4%, with an average of 69,3%. **Conclusion:** The results showed that the general performance of the academics was insufficient. We highlight the need for new strategies on undergraduate teaching about HPV, its complications and prevention.

Keywords: Human Papillomavirus (HPV); Biological Science; uterine cervical neoplasms; vaccines.

RESUMO

Introdução: O câncer do colo do útero afeta as mulheres em todo o mudo. O agente etiológico é o papilomavírus humano (HPV). Apesar da alta incidência, existem programas de prevenção que incluem o exame Papanicolau e a vacina anti-HPV. **Objetivo:** O objetivo deste estudo foi avaliar a percepção e o conhecimento dos acadêmicos de graduação em Biomedicina da Pontifícia Universidade Católica de Goiás (PUC Goiás) sobre a infecção pelo HPV, o câncer do colo do útero e a vacina anti-HPV. **Métodos:** Um questionário foi aplicado com perguntas de múltipla escolha. A média de acerto para cada grupo de questões foi classificada como satisfatória quando acima de 80%; razoável, entre 70 e 80%; e insatisfatório, quando menor que 70%. Os dados foram transportados para o programa *R Core Team* 2012 e para a análise estatística foi utilizado o teste qui-quadrado (χ^2), com intervalo de confiança de 95% e valor significativo inferior a 0,05. **Resultados:** Entre os 268 participantes, índices de acerto observados para as questões relacionadas ao conhecimento sobre a infecção pelo HPV variaram de 23,2 a 99,6%, com média de 75,7%; acerca do câncer do colo do útero, os índices de acerto ficaram entre 25,9 e 98,1%, com média de 68,9%; concernente à vacina anti-HPV, os índices de acerto variaram de 14,3 a 97,4%, com média geral de 69,3%. **Conclusão:** Os resultados mostraram que o conhecimento geral dos acadêmicos foi insuficiente. Destaca-se a necessidade de novas estratégias de ensino na graduação sobre o HPV, suas complicações e prevenção.

Palavras-chave: Papiloma Vírus humano (HPV); Ciências Biológicas; câncer de colo do útero; vacina.

INTRODUCTION

Human papillomavirus (HPV) is the most common sexually transmitted infection[1]. Therefore, HPV infection is the most studied as it is the main specific cause of 99.7% of cases of cervical cancer worldwide[2].

There are several risk factors for cervical cancer. The main risk factor is the HPV infection, followed by age and early onset of sexual activity among women under 25 years of age. High number of sexual partners, continuous use of oral contraceptives, immunosuppression (caused by infection with the human immunodeficiency virus – HIV – or use of immunosuppressants), and smoking may be related to HPV infection[3].

There are nearly 200 sequenced HPV genotypes. Of these, approximately 40 types can infect the genital mucosa and evolve to cancer. Genetically identified types are classified as high risk and low risk, according to their oncogenic potential[4]. Twelve HPV types, namely, HPV-16, HPV-18, HPV-31, HPV-33, HPV-35, HPV-39, HPV-45, HPV-51, HPV-52, HPV-56, HPV-58, and HPV-59 are known as high-risk types, and 11 HPV types, namely, HPV-6, HPV-11, HPV-40, HPV-42, HPV-43, HPV-44, HPV-54, HPV-61, HPV-72, HPV-81, and HPV-CP6108 are know as low-risk types. Another group considered as intermediate-risk type is composed of 8 HPV types categorized as probable high-risk (HPV-26, HPV-53, HPV-66, HPV-67, HPV-68, HPV-70, HPV-73 and HPV-82)[5,6].

According to the World Health Organization (WHO), cervical cancer is the fourth most common cancer worldwide, excluding nonmelanoma skin cancer, with approximately 530,000 new cases per year. Cervical cancer is the main cause of death of 265,000

[1]School of Medical, Pharmaceutical, and Biomedical Sciences of the *Pontifícia Universidade Católica de Goiás* (PUC Goiás) – Goiânia (GO), Brazil.
[2]School of Pharmacy of the *Universidade Federal de Goiás* (UFG) – Goiânia (GO), Brazil.

women per year[7]. In Brazil, cervical cancer is the third most common among the Brazilian population, excluding nonmelanoma skin cancer. The estimate for 2016 is 16,340 new cases with a risk of 15.85 cases per 100,000 women[8].

The Pap smear is the most common gynecological exam for cancer prevention. It enables the early detection of precursor lesions in asymptomatic women and may prevent the disease progression with appropriate monitoring and treatment[9]. The gynecological examination is quick, sensitive, and does not cause discomfort to the patient, which characterizes it as a safe screening method. The Pap smear is recommended by the WHO as the main prevention method to be included in programs to combat cervical cancer in several countries. According to the WHO, with a target population coverage of at least 80% and proper diagnosis and treatment of abnormal cases, the incidence of invasive cervical cancer may decline by 60 to 90% in average[10].

Two prophylactic HPV vaccines have been approved with the aim of strengthening cervical cancer prevention: Gardasil® (Merck Sharp & Dohme, Whitehouse Station, New Jersey, United States of America) and Cervarix® (Glaxo Smith & Kline Biologicals, Rixensart, Belgium). These two vaccines were approved by the Food and Drug Administration (FDA) in June 2006 and October 2009, respectively[11].

In 2014, the FDA approved a 9-valent HPV vaccine. Gardasil 9® vaccine prevents cervical, vulvar, vaginal, and anal cancers caused by HPV types 16, 18, 31, 33, 45, 52, and 58; and genital warts caused by HPV types 6 or 11. In addition, it provides protection against cervical cancer with up to 90% efficacy. Until the publication of this paper, the tetravalent vaccine had not yet been replaced by the 9-valent vaccine in all health programs worldwide. Only in some developed countries the vaccine was implemented, but not in the health services[12-14].

In clinical studies, Gardasil® vaccine shown to be highly effective against cancer in the anal and genital area, showing 100% efficacy against precancerous lesions and vaginal/vulvar cancers, 95% efficacy against cervical intraepithelial neoplasm, and 99% efficacy against genital lesions caused by HPV types 6, 11, 16, and 18. The duration of immunity of this vaccine is at least five years[15,16].

OBJECTIVE

To evaluate the perception and knowledge of the main aspects related to HPV infection, its implications in the development of cervical cancer, and the HPV vaccine among undergraduate biomedicine students at the *Pontifícia Universidade Católica de Goiás* (PUC Goiás).

METHODS

This was a descriptive study carried out in the undergraduate biomedicine program at PUC Goiás. This study included the administration of a questionnaire which was elaborated based on a literature review of similar studies carried out in other countries[17-20] and on studies that have been developed in medical and nursing programs at the referred university. In these studies, content included HPV infection, cervical cancer, and the HPV vaccine.

The total number of students enrolled in the undergraduate biomedicine program at PUC Goiás was 378 in 2015. Initially, 268 students were studied, with a participation rate of 70.9%. The sample was considered representative; however, only 266 students were included in the study because two participants did not respond to most questions.

After reading and signing the informed consent form (ICF), the subjects who agreed to be part of the research received the questionnaire.

Sample group was defined according to the following inclusion criteria: to be properly enrolled in the undergraduate program in Biological Sciences (medical/biomedicine modality) of the institution, age over 18 years, be present when questionnaires were administered, agreed to participate in this research after explanation of the study objectives, and have signed the consent form.

The research project was approved by the Research Ethics Committee of PUC Goiás under the opinion number 1,227,310. Data were collected by means of a questionnaire containing 38 multiple choice questions, which were distributed as follows: 5 aimed at sample characterization, 12 assessed knowledge of HPV, 15 tested knowledge of cervical cancer, and the remaining 6 were about the anti-HPV vaccine. The topics covered in the survey included definitions, routes of transmission and prevention of the virus infection, cancer development risks, administration and use of the vaccine, among others.

The questionnaires were administered at the beginning or end of regular classes of the course. Students had enough time to answer the questions.

Participants' knowledge was evaluated based on the percentage of correct answers for each question on the three themes: knowledge of HPV, cervical cancer, and anti-HPV vaccine.

Score averages obtained for each group of questions were classified into "satisfactory," when scores were greater than 80%; "reasonable," when they were between 70 and 80%; and "insufficient," when they were below 70%.

Information was collected and organized in a database, whose data were inputted in Microsoft Office Excel® 2013 spreadsheets (Microsoft Corporation, Redmond, Washington, United States of America). For statistical analysis, data were transferred to the program R Core Team 2012 and were analyzed by descriptive and comparative statistical methods using the chi-square test (χ^2), with 95% confidence interval and significant value below 0.05. Results were shown in graphs and tables using the program R Commander (Rcmdr), 2005.

RESULTS

Biomedicine student's characteristics that were evaluated in this study are shown in **Table 1**. The questionnaires that were administered to the 266 undergraduate biomedicine students were analyzed. Among the students, 81.6% (n = 217) were female and 18.4% (n=49) were male. The ages of the participants ranged from 18 to 42, and the majority (n=237; 89.1%) were aged 18–23 years. Among the participants, 242 (91.0%) were single or divorced, and 166 (62.4%) reported having an active sex life.

With regard to the participants' knowledge of HPV infection, the overall mean score was 75.7%. The highest scores were obtained

on questions pertaining to knowledge of HPV existence (99.6%) and awareness of HPV as a sexually transmitted disease (96.2%). However, when the knowledge of HPV transmission through kissing was evaluated, the percentage of correct answers was 23.3%. This was the lowest score of participants' knowledge of HPV.

A statistically significant difference was observed (p=0.026) on the question that investigated the knowledge of a possible transmission of HPV from mother to child. Male participants answered correctly 81.6% of questions, whereas female participants answered correctly 67.7% of questions (**Table 2**).

The overall mean score on participants' knowledge of cervical cancer was 68.9%. The highest scores were obtained on the question that assessed knowledge of HPV infection as main agent of cervical cancer (98.1%) and awareness of sex with multiple partners as a risk factor for such cancer (92.1%). Statistically significant differences were found on the questions on the association of some foods with cervical cancer (p=0.037) and early onset of sexual intercourse as a risk factor for the same type of cancer (p=0.008); in these two questions female participants stood out in relation to male participants, with scores equivalent to 81.6 % and 74.2%, respectively (**Table 3**).

With regard to the assessment of participants' knowledge of the anti-HPV vaccine, mean score was 69.3%. Male participants achieve a slightly higher score (71.8%) compared to the mean score of female participants (69.5%) (**Table 4**).

Table 1 – Sample characterization of biomedicine students at the *Pontifícia Universidade Católica de Goiás* (PUC Goiás), in 2015.

VARIABLE	n	f (%)
Sex		
Female	217	81.6
Male	49	18.4
Total	266	100.0
Age range		
18–23 years	237	89.1
24–29 years	19	7.1
≥30 years	6	2.3
NI	4	1.5
Marital Status		
Single/Divorced	242	91.0
Married	10	3.8
Other	14	5.3
Period		
P1	11	4.1
P2	56	21.1
P3	27	10.1
P4	47	17.7
P5	22	8.3
P6	39	14.7
P7	25	9.4
P8	27	10.1
P9	12	4.5
Active Sex Life		
Yes	166	62.4
No	99	37.2
NI	1	0.4

Source: School of Medical, Pharmaceutical, and Biomedical Sciences.
NI: not informed.

Table 2 – University students' knowledge of the Human Papillomavirus (HPV) Infection, *Pontifícia Universidade Católica de Goiás* (PUC Goiás), 2015.

Questions	Female		Male		Total		p-value
	n	f (%)	n	f (%)	n	f (%)	
Have you heard about HPV?							
Yes	217	100.0	48	98.0	265	99.6	0.184
No	0	0.0	1	2.0	1	0.4	
Is HPV infection a sexually transmitted disease?							
Yes	208	95.9	48	98.0	256	96.2	0.562
No	8	3.7	1	2.0	9	3.4	
NI	1	0.5	0	0.0	1	0.4	
Is kissing a route of HPV transmission?							
Yes	50	23.0	12	24.5	62	23.3	
No	165	76.0	37	75.5	202	75.9	0.854
NI	2	1.0	0	0.0	2	0.8	
Can direct contact with body fluids transmit HPV?							
Yes	163	75.1	38	77.6	201	75.6	
No	52	24.0	10	20.4	62	23.3	0.621
NI	2	0.9	1	2.0	3	1.1	
Can contaminated water transmit HPV?							
Yes	21	9.7	5	10.2	26	9.8	
No	192	88.5	43	87.8	235	88.3	0.907
NI	4	1.8	1	2.0	5	1.9	
Is there mother-child HPV transmission?							
Yes	147	67.7	40	81.6	187	70.3	
No	66	30.4	7	14.3	73	27.4	0.026
NI	4	1.8	2	4.1	6	2.3	
Is HPV infection common?							
Yes	195	89.9	42	85.7	237	89.1	
No	19	8.8	7	14.3	26	9.8	0.253
NI	3	1.4	0	0.0	3	1.1	
Who can get infected with HPV?							
Women	39	18.0	11	22.4	50	18.8	
Men	1	0.5	0	0.0	1	0.4	
Both	170	78.3	37	75.5	207	77.8	0.682
NI	7	3.2	1	2.0	8	3.0	
Is the incidence of HPV infection higher among women aged 20-30 years?							
Yes	168	77.4	42	85.7	210	78.9	0.198
No	49	22.6	7	14.3	56	21.1	
HPV infection is most often:							
Symptomatic	51	23.5	9	18.4	60	22.6	0.4111
Asymptomatic	163	75.1	40	81.6	203	76.3	
NI	3	1.4	0	0.0	3	1.1	
Does HPV infection cause genital warts?							
Yes	178	82.0	41	83.7	219	82.3	
No	37	17.1	7	14.3	44	16.5	0.659
NI	2	0.9	1	2.0	3	1.1	
Is HPV infection curable?							
Yes	140	64.5	34	69.4	174	65.4	
No	74	34.1	15	30.6	89	33.5	0.597
NI	3	1.4	0	0.0	3	1.1	

Source: School of Medical, Pharmaceutical, and Biomedical Sciences.
NI: not informed; HPV: Human Papillomavirus.

The highest rate of correct answers was related to the question on knowledge of the existence of anti-HPV vaccine (97.4%), and the lowest score was on the vaccination recommended age range (14.3%). This question showed a statistically significant difference (p=0.000393). Another statistically significant difference was identified on the question on the recommended sex for anti-HPV vaccine (p=0.005), with male participants obtaining higher scores, equivalent to 65.3% (**Table 4**).

In the assessment of overall performance concerning HPV infection – including cervical cancer and anti-HPV vaccine – the highest level of knowledge demonstrated by the highest scores was related to HPV (75.7%), and the lowest scores were related to cervical cancer (68.9%) (**Table 5**).

DISCUSSION

In this study, the majority of participants were single/divorced (91.0%) and had active sexual life (62.4%). Most of them were aged 18 to 23 years (89.1%). These data show that the participants have a high degree of exposure to the main risk factors for HPV infection and cervical cancer[3].

When questioned about the HPV infection, most participants were aware of the virus and identified the infection as a sexually transmitted disease. This is an important finding which indicates the students' concern about avoiding exposure to risk factors in the sexual intercourse. An overall mean score equivalent to 75.7% showed that the participants have reasonable level of knowledge of the pathogenesis of HPV. However, when assessing the HPV transmission through kissing, only 23.3% of participants responded correctly. This is worrying, as similar oral and genital lesions caused by the HPV have been discovered, which suggested their inclusion in the development of oral cancer. In such cases, association of open-mouth ("French") kissing with oral HPV infection and also the transmission of genital HPV positive to the oral tract through oral sex were revealed[21,22].

A statistically significant difference in relation to female participants (74.2%) compared to male participants (55.1%) was observed (p=0.008). This allowed us to infer that women in this study have concerns about the HPV transmission and probably adhere to other preventive measures, as women under 25 years of age are a risk group with less chance of developing cervical cancer[3].

The male population is primarily responsible for the transmission of HPV to women, because they act as reservoirs, transmitting oncogenic types more easily to women than the opposite – from women to men[23]. Most of these infections are asymptomatic and transient, and usually undetectable within one or two years; however, persistent infection favors the development of future neoplasms[24].

When the students were asked about the existence of vertical transmission of HPV, 70.3% of them were aware of this type of transmission, with significant frequency (p=0.026) and greater knowledge score among male participants (81.6%); women presented 67.7% of correct responses. However, 27.4% of students did not consider this possibility. In fact, during the passage of the fetus through the birth canal, the HPV infected mucosa of the mother can infect and stimulate the proliferation of the virus in the upper airways, which can evolve to recurrent respiratory papillomatosis with lung involvement[25,26].

With regard to the assessment of the HPV cure, an unsatisfactory level of knowledge was observed (65.4%). This is an important

Table 3 – University students' knowledge of the cervical cancer, *Pontifícia Universidade Católica de Goiás* (PUC Goiás), 2015.

Questions	Female		Male		Total		p-value
	n	f (%)	n	f (%)	n	f (%)	
Can HPV infection cause cervical cancer?							
Yes	214	98.6	47	96.0	261	98.1	
No	3	1.4	1	2.0	4	1.5	0.719
NI	0	0.0	1	2.0	1	0.4	
Is cervical cancer related to genetic predisposition?							
Yes	139	64.1	31	63.3	170	63.9	
No	76	35.0	16	32.7	92	34.6	0.865
NI	2	0.9	2	4.1	4	1.5	
Can some foods cause cervical cancer?							
Yes	40	18.4	14	28.6	54	20.3	0.037
No	177	81.6	35	71.4	212	79.7	
Can bacterial infection cause cervical cancer?							
Yes	138	63.6	36	73.5	174	65.4	
No	76	35.0	13	26.5	89	33.5	0.231
NI	3	1.4	0	0.0	3	1.1	
Having multiple sexual partners is a risk factor for the development of cervical cancer?							
Yes	201	92.6	44	89.8	245	92.1	0.507
No	16	7.4	5	10.2	21	7.9	
Is early sexual intercourse characterized as a risk factor for cervical cancer?							
Yes	161	74.2	27	55.1	188	70.7	0.008*
No	56	25.8	22	44.9	78	29.3	
Is IUD use a risk factor for cervical cancer?							
Yes	98	45.2	20	40.8	118	44.4	
No	118	54.4	28	57.1	146	54.9	0.641
NI	1	0.5	1	2.0	2	0.8	
Is smoking a risk factor for the development of cervical cancer?							
Yes	108	49.8	27	55.1	135	50.8	0.500
No	109	50.2	22	44.9	131	49.2	
Is alcohol consumption a risk factor for the cervical cancer?							
Yes	94	43.3	27	55.1	121	45.5	0.142
No	122	56.2	22	44.9	144	54.1	
NI	1	0.5	0	0.0	1	0.4	
Is lack of hygiene a risk factor for the cervical cancer?							
Yes	158	72.8	39	79.6	197	74.1	0.328
No	59	27.2	10	20.4	69	25.9	
Is pain after sexual intercourse one of the symptoms of cervical cancer?							
Yes	164	75.6	29	58.2	193	72.6	0.02*
No	53	24.4	20	40.8	73	27.4	
Are bleedings between menstrual periods symptoms of cervical cancer?							
Yes	156	71.9	32	65.3	188	70.7	
No	60	27.6	17	34.7	77	28.9	0.336
NI	1	0.5	0	0.0	1	0.4	
Is the occurrence of bloody vaginal discharge a symptom of cervical cancer?							
Yes	187	86.2	40	81.6	227	85.3	
No	27	12.4	9	18.4	36	13.5	0.291
NI	3	1.4	0	0.0	3	1.1	
Are fever and headache symptoms of cervical cancer?							
Yes	45	20.7	12	24.5	57	21.4	
No	171	78.8	37	75.5	208	78.2	0.574
NI	1	0.5	0	0.0	1	0.4	
Is pelvic pain a characteristic symptom of cervical cancer?							
Yes	170	78.3	40	81.6	210	78.9	0.610
No	47	21.7	9	18.4	56	21.1	

Source: School of Medical, Pharmaceutical, and Biomedical Sciences.
NI: not informed; HPV: Human Papillomavirus; IUD: intrauterine device.

fact that suggests strengthening the knowledge of this peculiarity of HPV infection is necessary, as the natural history of the problem is the spontaneous healing. However, the presence of oncogenic types associated with multiple risk factors can lead to persistent infection, which in turn can lead to neoplastic lesions and evolve to cervical cancer[24,27]. Nevertheless, when cervical cancer is early detected, it is possible to delay the development of invasive cancer or even cure it by means of clinical interventions such as colposcopy and biopsy, local excision, conization, and hysterectomy[28].

Participants' knowledge of cervical cancer was considered unsatisfactory and corresponded to the worst score found in the study. However, most of the students in this study were aware of the main risk factors for cervical cancer, such as genetic predisposition, bacterial infection, early onset of sexual intercourse, and multiple sexual partners.

A significant number of students were unaware of smoking as a risk factor for the development of cervical cancer (49.2%). Tobacco is capable of exposing the DNA in cervical epithelial cells to nicotine, cotinine, and its metabolites, and of promoting mutagenesis, genomic damage, and proliferation of these cells. In addition, it can induce immunosuppression, facilitating the occurrence of lesions and HPV persistence. Brazilian studies have shown greater probability of cancer in women who smoke; it was estimated that smoking at least 100 cigarettes during their lifetime would be a potential risk factor for the development of cervical cancer[29,30].

In general context, students know the signs and symptoms of cervical cancer. This type of cancer grows slowly and it is usually asymptomatic in the early stage; however, the evolution of the disease may lead to intermittent vaginal bleeding, pain after intercourse, abnormal vaginal discharge, and abdominal pain[31].

Cervical cancer is a preventable and curable disease; however, early detection of precursor lesions by means of the Pap test, which is the main strategy to control this cancer, is necessary. Primary prevention, which is obtained through HPV vaccines that provide protection for the main HPV types is also essential[6,11,16,18].

Table 4 – University students' knowledge of anti-HPV vaccine, *Pontifícia Universidade Católica de Goiás* (PUC Goiás), 2015.

Questions	Female		Male		Total		p-value
	n	f (%)	n	f (%)	n	f (%)	
Have you heard about the anti-HPV vaccine?							
Yes	212	97.7	47	95.9	259	97.4	
No	4	1.8	2	4.1	6	2.3	0.343
NI	1	0.5	0	0.0	1	0.4	
Is the vaccine included in the annual vaccination calendar of the Ministry of Health?							
Yes	182	83.9	37	75.5	219	82.3	0.166
No	35	16.1	12	24.5	47	17.7	
Is the vaccine approved for those individuals who have not had contact with the HPV virus?							
Yes	195	89.9	42	85.7	237	89.1	
No	20	9.2	6	12.2	26	9.8	0.502
NI	2	0.9	1	2.0	3	1.1	
Who can use the HPV vaccine?							
Women	124	57.1	15	30.6	139	52.3	
Men	1	0.5	0	0.0	1	0.4	0.005
Both	90	41.5	32	65.3	122	45.9	
NI	2	0.9	2	4.1	4	1.5	
For what age range is the anti-HPV vaccine recommended?							
9 to 13 years	176	81.1	30	61.2	206	77.4	
10 to 20 years	30	13.8	8	16.3	38	14.3	
20 to 30 years	9	4.1	7	14.2	16	6.0	0.000393
30 to 40 years	0	0.0	2	4.1	2	0.8	
Above 40 years	0	0.0	0	0.0	0	0.0	
NI	2	0.9	2	4.1	4	1.5	
Do vaccinated women need to undergo the preventive exam annually?							
Yes	195	89.9	45	91.8	240	90.2	
No	21	9.7	4	8.2	25	9.4	0.736
NI	1	0.5	0	0.0	1	0.4	

Source: School of Medical, Pharmaceutical, and Biomedical Sciences.
NI: not informed; HPV: Human Papillomavirus.

Table 5 – Average of correct responses according to variables of the biomedicine students from the *Pontifícia Universidade Católica de Goiás* (PUC Goiás), 2015.

Variables	HPV (%)	Cancer (%)	Vaccine (%)
All (n=266)	75.7	68.9	69.3
Gender			
Female (*n*=217)	76.5	70.2	69.5
Male (*n*=49)	79.1	65.9	71.8
Age range (years)			
18 – 23 (n=237)	77.0	69.5	69.8
24 – 29 (n=19)	72.4	69.1	71.9
≥32 (n=6)	70.8	68.9	72.2
NI (n=4)	70.8	66.7	58.3
Marital status			
Single or divorce (*n*=242)	77.5	69.2	69.8
Married (*n*=10)	74.2	66.7	68.3
Other (*n*= 14)	68.5	71.9	71.4
Period			
First (*n*=11)	70.4	70.3	71.2
Second (*n*=56)	71.3	67.7	72.9
Third (*n*=27)	68.8	68.4	71.0
Fourth (*n*=47)	79.1	71.0	71.3
Fifth (*n*=22)	84.5	72.1	68.9
Sixth (*n*=39)	81.2	70.6	68.8
Seventh (*n*=25)	81.0	68.5	64.0
Eight (*n*=27)	80.6	69.9	68.5
Ninth (*n*=12)	75.0	68.9	66.7
Period (Virology and Cytopathology)			
1st to 3rd (*n*=94)	70.5	68.2	72.2
4th to 6th (*n*=108)	80.9	70.6	69.9
7th to 9th (n=64)	79.7	69.2	66.4
Active sex life			
Yes (*n*=166)	77.7	70.6	70.9
No (*n*=99)	75.7	67.5	68.2
NI (*n*=1)	75.0	66.7	66.7

Source: School of Medical, Pharmaceutical, and Biomedical Sciences.
NI: not informed; HPV: Human Papillomavirus.

Regarding the anti-HPV vaccine as a new prevention method for HPV infection and cervical cancer, students' knowledge score showed a low average. In this study, most participants heard about the vaccine (97.4%) and know that it is already included in the National Immunization Program (82.3%), which may be explained by the media coverage of the vaccination campaign promoted by the Ministry of Health in 2014[31]. Results of a research carried out in hospitals located in Bangkok, Thailand[20], revealed that nurses (63%) and physicians (73%) respondents believed that the vaccine is introduced for both boys and girls before the onset of sexual activity.

The period that the participant was attending had no significant influence on the knowledge of the cervical cancer and anti-HPV vaccine; however, in this study, increased knowledge of HPV infection was found among participants who were enrolled at "Immunology" and "Virology" (4th period), and mainly at "Cytopathology" (6th period), which had a strong impact. However, the level of knowledge of the subject was relatively stable until the last period of the biomedicine program.

The biomedical scientist contributes to the promotion of health of the population, especially in the prevention of diseases, since he or she is a professional who can work in several areas[32]. This study results suggested that there is lack of adequate knowledge of the key themes peculiarities. A greater coverage of the subject is relevant for these students, so they may promote adequate health care to the population, as future biomedical scientists.

CONCLUSION

In view of the results obtained in this study, the overall performance of students was considered reasonable, suggesting that the knowledge acquired by students during the biomedicine program was not sufficient. These data corroborate other studies carried out in different locations and health fields[17-20] which have addressed similarly HPV infection, cervical cancer, and anti-HPV vaccine.

The need for a broader coverage of this particular theme in the classroom should be highlighted, in addition to the development of new continuing education strategies, such as courses, symposiums, and workshops, conducted by people responsible to inform the students about HPV, its complications and prevention, as well as the encouragement of academic leagues and advertising campaigns.

Conflict of interests

The authors declare there was no conflict of interests.

REFERENCES

1. Fernandes JV, Meissner RV, Carvalho MGF, Fernandes TAAM, Azevedo PRM, Villa LL. Prevalence of HPV infection by cervical cytologic status in Brazil. Int J Gynecol Pathol. 2009;105(1):21-4.
2. Walboomers JMM, Jacobs MV, Manos MM, Bosch FV, Kummer JA, Shah KV, et al. Human Papillomavirus is a necessary cause of invasive cervical cancer worldwide. J Pathol. 1999;189(1):12-9.
3. Barbosa VFC, Pinto VFC, Paiva SG. Infecção pelo Papilomavírus Humano (HPV) em mulheres com vírus da imunodeficiência humana (HIV): revisão não sistemática. In: Congresso Norte Nordeste de Pesquisa e Inovação, 7., Palmas, 2012.
4. Britt KE, Alvarez RD, Huh WK. Human Papillomavirus: what every provider should know. Am J Obstet Gyneco. 2013;208(3):169-75.
5. Muñoz N, Castellsagué X, González AB, Gissmann L. Chapter 1: HPV in the etiology of human cancer. J Vaccine. 2006;24(Suppl 3):1-10.
6. Steenbergen RDM, Snijders PJF, Heideman DAM, Meijer CJLM. Clinical implications of (epi)genetic changes in HPV-induced cervical precancerous lesions. Nat Rev Cancer. 2014;14(6):395-405.
7. World Health Organization. International Agency for Research on Cancer. Globocan 2012: estimated cancer incidence, mortality and prevalence worldwide in 2012. 2012 [cited 2016 Março 27]. Available from: http://globocan.iarc.fr/
8. Brasil. Instituto Nacional do Câncer. Estimativa 2016. Incidência do câncer no Brasil. Rio de Janeiro: INCA, 2015 [cited 2016 Maio 15]. Available from: http://www.inca.gov.br/bvscontrolecancer/publicacoes/edicao/Estimativa_2016.pdf
9. Araújo SCF, Caetano R, Braga JU, Silva FVC. Eficácia das vacinas comercialmente disponíveis contra a infecção pelo papilomavírus em mulheres: revisão sistemática e metanálise. Cad Saúde Pública. 2013;29:32-44.
10. World Health Organization. National cancer control programmes: policies and managerial guidelines. 2ª ed. Geneva: WHO; 2002.
11. World Health Organization. Human Papillomavirus and related cancers in Americas. Summary Report 2010. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). [cited 26 Abril 2016]. Available from: http://www.healthycaribbean.org/wp-content/uploads/resources/220313/WHO-Human-Papillomavirus-and-Related-Cancers-AMERICAS-2010.pdf
12. Gameiro A, Alves J, Santo I, Azevedo J. Anogenital warts in a major venereology clinic: Centro de Saúde da Lapa – Lisbon, 2008 to 2014. Acta Médica Portuguesa. 2016;29(2):101-6.
13. Simões RSQ, Barth OM. Papillomavirus: viral vectors in the gene therapy and new therapeutic targets. IJBR. 2015;6(10):763-8.
14. Quiroga SM, Vega EM, Fungo MSM, Naeko SA. Controversy regarding the use of the vaccine against Human Papillomavirus. Rev Salud Pública. 2015;19(3):91-103.
15. Ali H, Guy RJ, Wand H, Read TR, Regan DG, Grulich AE, et al. Decline in in-patient treatments of genital warts among young Australians following the national HPV vaccination program. BMC Infectious Diseases. 2013;13:140.
16. Villa LL, Costa RLR, Petta CA, Andrade RP, Paavonen J, Iversen OE, et al. High sustained efficacy of a prophylactic quadrivalent human papillomavirus types 6/11/16/18 L1 virus-like particle vaccine through 5 years of follow-up. British J Cancer. 2006;95(11):1459-66.
17. Beygad KD. Knowledge and applications of the midwives and nurses at an educational hospital on the early diagnosis of cervix cancer. Asian Pacific J Cancer Prev. 2011;12(2):481-5.
18. Phianmongkhol Y, Suwan N, Srisomboon J, Kietpeerakool C. Knowledge about Human Papillomavirus infection and cervical cancer prevention among nurses in Chiang Mai University Hospital, Thailand. Asian Pacific J Cancer Prev. 2011;12(3):823-5.
19. Ortashi O, Shallai M, Osman N, Raheel H. Knowledge, attitude and practice of school nurses in the United Arab Emirates about HPV infection and vaccine. Asian Pacific J Cancer Prev. 2012;13(12):6481-4.
20. Songthap A, Pitisuttithum P, Kaewungwal J, Fungladda W, Bussaratid V, Koonsaeng S. Knowledge, attitudes, and acceptability of a Human Papillomavirus vaccine among healthcare providers. Southeast Asian J Trop Med public Health. 2009;40(5):1048-56.
21. Dahlstrom KR, Burchell AN, Ramanakumar AV, Rodrigues A, Tellier PP, Hanley J, et al. Sexual transmission of oral Human Papillomavirus infection among men. CEBP. 2014;23(12):2959-64.
22. Marklund L, Hammarstedt L. Impact of HPV in oropharyngeal cancer. J Oncol. 2010;2011:1-6.
23. Zardo, GP, Farah FP, Mendes FG, Franco CAGS, Molina GVM, Melo GN, et al. Vacina como agente de imunização contra o HPV. Ciên Saúde Colet. 2014;19(9):3799-808.
24. Snijders PJ, Steenbergen RDM, Heideman D, Meijer CJ. HPV-mediated cervical carcinogenesis: concept and clinical implications. J Pathol. 2006;208(2):152-64.

25. Mammas IN, Sourvinos G, Spandidos DA. Human papilloma virus (HPV) infection in children and adolescents. Eur J Pediatr. 2009;168(3):267-73.
26. Medeiros LR, Ethur ABM, Hilgert JB, Zanini RR, Berwanger O, Bozzeti MC, et al. Vertical transmission of the human papillomavirus: a systematic quantitative review. Cad Saúde Pública. 2005;21(4):1006-15.
27. Doorbar J, Quint W, Banks L, Bravo IG, Stoler M, Broker TR, et al. The biology and life-cycle of Human Papillomaviruses. J Vaccine. 2012;30:55-70.
28. Andrade JM, Yamaguchi NH, Oliveira AB, Perdicaris M, Pereira ST, Petitto JV, et al. Rastreamento, diagnóstico e tratamento do carcinoma do colo do útero. Projeto Diretrizes Associação Médica Brasileira e Conselho Federal de Medicina; 2001 May [cited 2016 Junho 16]. Available from: http://www.bibliomed.com.br/diretrizes/pdf/carcinoma_colo_utero.pdf
29. Danaei G, Vander Hoom S, Lopez AD, Murray CJ, Ezzati M. Comparative risk assessment collaborating group (cancers). Causes of cancer in the world: comparative risk assessment of nine behavioural and environmental risk factors. Lancet. 2005;366(9499):1784-93.
30. Uchimura NS, Ribalta JCL, Focchi L, Uchimura TT, Simões MJ, Silva ES. Os efeitos do tabagismo na densidade das células de Langerhans do colo uterino. Acta Scient Health Science. 2004;26(2):369-73.
31. Brasil. Ministério da Saúde. Guia prático sobre HPV: perguntas e respostas para o profissional da saúde. 2014 [cited 2016 Maio 3]. Available from: <http://portalarquivos.saude.gov.br/campanhas/2014/hpv/Guia_perguntas_e_repostas_MS_HPV_profissionais_de_saude.pdf>.
32. Campos D. Manual do biomédico: história, atuação, importância para a saúde, para educação e para a sociedade brasileira. [cited 2016 Maio 24]. Available from: http://www.crbm1.gov.br/MANUAL_BIOMEDICO.pdf

Address for correspondence:
ANDREA ALVES RIBEIRO
Pontifícia Universidade Católica de Goiás, Departamento de Biomedicina
Rua 232, nº 128 – Setor Universitário
Goiânia (GO), Brasil
Fone: +55 (62) 3946 1194 / Fax: +55 (62) 3946 1531
E-mail: andrea.ribeiro13@gmail.com

Received on: 07.17.2016
Approved on: 08.28.2016

Study of prevalence of HIV infection and its epidemiological variables in pregnant women at Plantadores de Cana Hospital, Campos dos Goytacazes, Rio de Janeiro, a reference in high risk pregnancies

Estudo da prevalência da infecção pelo HIV e suas variáveis epidemiológicas, em gestantes atendidas no Hospital Plantadores de Cana, em Campos dos Goytacazes, Rio de Janeiro, referência em gestação de alto risco

Aline Guedes Cozendey[1], Débora Moreira Bravin[1], Regina Célia de Souza Campos Fernandes[1]

ABSTRACT

Introduction: The prevalence rate of HIV infection is less than 1% in the general population. Among women, the rate was 13.2 cases per 100,000 inhabitants, leaving the presence of women more and more evident in the acquired immunodeficiency syndrome scenario. **Objective:** To assess the prevalence of HIV infection and its epidemiological variables in pregnant women treated at Hospital Plantadores de Cana (HPC), in the city of Campos dos Goytacazes, Rio de Janeiro State. **Methods:** This is a documentary, critical and analytical study of all pregnant women admitted from October 2012 to March 2013, using transcription of medical records, then tabulated and analyzed on the System for Statistical Analyses and Genetics. **Results:** We analyzed 1,795 medical records of pregnant women; 14 were HIV-positive, corresponding to a prevalence of 0.78%. According to epidemiological data obtained in data collection from medical records, pregnant women were mostly aged between 19 and 25 years (64.29%), all were single (100%), of black (50%) and brown (42.86%) ethnicity. Prenatal consultation occurred in 71.43%, with 7 to 10 appointments (35.71%). Cesarean delivery occurred in 71.43% of cases. **Conclusion:** HIV infection in pregnant women seen in reference hospital for high risk pregnancy in Campos dos Goytacazes showed a prevalence higher than the national average, and its epidemiological characteristics correspond to those mentioned in the literature.

Keywords: HIV; pregnant women; epidemiology.

RESUMO

Introdução: A taxa de prevalência de infecção pelo vírus HIV encontra-se menor que 1% na população em geral. Entre as mulheres, a taxa foi de 13,2 casos por 100 mil habitantes, deixando cada vez mais evidente a presença da mulher no cenário da síndrome da imunodeficiência adquirida. **Objetivo:** Avaliar a prevalência da infecção pelo HIV e suas variáveis epidemiológicas em gestantes atendidas no Hospital Plantadores de Cana (HPC), em Campos dos Goytacazes, no Rio de Janeiro. **Métodos:** Estudo documental, crítico e analítico de todas as gestantes admitidas no período de outubro de 2012 a março de 2013, por meio da transcrição dos prontuários médicos, sendo os dados coletados, tabulados e analisados pelo Sistema para Análises Estatísticas e Genéticas. **Resultados:** Analisamos 1795 prontuários de gestantes, das quais 14 eram portadoras do HIV, correspondendo a uma prevalência de 0,78%. Segundo dados epidemiológicos obtidos na coleta de dados dos prontuários, as gestantes caracterizavam-se, em sua maioria: pela idade entre 19 e 25 anos (64,29%); pela ausência de relato de união civil (100%); pela etnia negra (50%) e parda (42,86%). A realização de pré-natal ocorreu em 71,43% dos casos, com 7 a 10 consultas médicas em 35,71%. O parto cesariano ocorreu em 71,43% dos casos. **Conclusão:** A infecção pelo HIV nas gestantes atendidas no hospital de referência para gestações de alto risco em Campos dos Goytacazes apresentou uma prevalência maior do que a média nacional, e suas características epidemiológicas correspondem àquelas citadas na literatura.

Palavras-chave: HIV; gestantes; epidemiologia.

INTRODUCTION

From January 2000 to June 2015, 92,210 HIV-infected pregnant women were notified[1] in Brazil, and in the period from 2005 to 2014 there was an increase in the national rate of detection of contaminated pregnancies: from 2 to 2.6 cases for every 1,000 live births[1]. The State of Rio de Janeiro shows a higher rate of HIV detection in pregnant women than the national rate: in 2014, 4 cases were recorded for 1,000 live births. Most infected women are of reproductive age, resulting in 2,100 new cases of infection detected per day in children, with almost of them all being due to mother-to-child transmission[2,3].

Vertical transmission of HIV can occur during pregnancy (particularly in the third trimester of pregnancy), during delivery, and throughout the lactation period. The main transmission mechanisms involve intrauterine and intrapartum transmission[4].

In a study called *Estudo Sentinela Parturiente,* of 2004, the prevalence of HIV observed in pregnant women in Brazil was of 0.41%, corresponding to an estimated total of 12,456 HIV-positive pregnant women for the year of 2004. Considering the total cases of HIV infections reported in pregnant women in 2010 (5,666), it a significant gap of around 50% can be estimated in the coverage of HIV testing in this population[5].

OBJECTIVE

To evaluate the percentage of HIV-infected pregnant women at Hospital Plantadores de Cana (HPC), in the city of Campos dos

[1]Faculdade de Medicina de Campos – Campos dos Goytacazes (RJ), Brasil.

 DOI: 10.5533/DST-2177-8264-201628304

Goytacazes (RJ), a reference hospital, and their epidemiological variables, thus confirming the need to study, report and research this pathology, with emphasis on the importance of prenatal care and on the implementation of assistance measures for pregnant women living with HIV.

METHODS

This is a documentary, critical and analytical study of all pregnant women assisted by the HPC Obstetrics Service, carried out from October 2012 to March 2013.

The study population consisted of 1,795 pregnant women.

Data from the medical records of pregnant women with HIV infection, confirmed prior to pregnancy, during prenatal care or during delivery, were analyzed by a revision of their records, specialty sheet and prenatal card, through which their clinical (pathological antecedents such as hypertension, diabetes mellitus, urinary tract infection, syphilis) and epidemiological aspects (age group, marital status, race, type of delivery, number of pregnancies, prenatal care and number of visits) were analyzed.

Based on the clinical history of the patient, we recovered the pathological history, the family history, the number of pregnancies and the diagnosis of syphilis. The number of prenatal consultations and the type of delivery were analyzed according to references from the Ministry of Health[6] and the World Health Organization (WHO)[7].

The epidemiological variables studied were: age group, ethnicity and marital status. The criteria for dividing the patient's age groups were categorized according to the prenatal card[6].

The results of the research were tabulated in a database created in MS EXCEL 2010 and analyzed by the System of Statistical and Genetic Analysis (SAEG) version 9.1[8], with which the frequencies and the statistical analyzes of the studied variables were obtained. The results obtained were demonstrated in the form of graphs and tables.

The respective confidence intervals (CI) of 99% of the patients were estimated.

The study was approved by the Research Ethics Committee of the School of Medicine of Campos.

RESULTS

A total of 1,795 records of pregnant women who were admitted to HPC during the study period were analyzed. Of these, 14 were carriers of HIV, corresponding to a prevalence of 0.78% (14/1,795).

According to epidemiological data, among the pregnant women infected, 64.29% (9/14) were aged between 19 and 25 years and none reported civil union (100% -14/14). 50% of them reported black color (7/14), and 42.86% reported brown color (6/14), according to **Table 1**.

The absence of pathological antecedents of arterial hypertension, diabetes and urinary tract infection was observed in 42.86% (6/14) of the infected pregnant women; 71.43% of them (10/14) presented a family history of comorbidities; all patients reported previous pregnancies; there was a predominance of cesarean delivery, occurring in 71.43% of the cases (10/14), and 42.85% (6/14) of the pregnant women did not report having undergone an abortion (**Table 2**).

Prenatal care was performed in 71.43% (10/14) of the pregnancies: an average of 7 to 10 medical consultations in 35.71% of the cases (5/14), according to **Table 3**.

Table 1 – Demographic variables of HIV-infected pregnant women seen at the HPC.

Variable	n	%	IL	SL
Age Group				
Up to 18	1	7.14	0.00%	20.63%
19 to 25	9	64.29	39.19%	89.39%
26 to 34	3	21.43	0.00%	42.92%
Over 35	1	7.14	0.00%	20.63%
Marital Status				
Single	14	100.00	100.00%	100.00%
Married		0.00	0.00%	0.00%
Stable union		0.00	0.00%	0.00%
Other		0.00	0.00%	0.00%
NR		0.00	0.00%	0.00%
Ethnicity				
White	1	7.14	0.00%	20.63%
Black	7	50.00	23.81%	76.19%
Brown	6	42.86	16.93%	68.78%
NR		0.00	0.00%	0.00%

IL: inferior limit; SL: superior limit; NR: no response.

Table 2 – Clinical characteristics of HIV-infected pregnant women.

Variable	n	%	IL	SL
Pathological Background				
None	6	42.86	16.93%	68.78%
HBP	1	7.14	0.00%	20.63%
HBP +Diabetes	1	7.14	0.00%	20.63%
HBP + UTI	1	7.14	0.00%	20.63%
NR	5	35.71	10.61%	60.81%
Type of birth				
Normal	0	0.00	0.00%	0.00%
Cesarean section	10	71.43	47.76%	95.09%
None	4	28.57	4.91%	52.24%
Pregnancy				
I	1	7.14	0.00%	20.63%
II	6	42.86	16.93%	68.78%
III	1	7.14	0.00%	20.63%
IV	4	28.57	4.91%	52.24%
V	1	7.14	0.00%	20.63%
VIII	1	7.14	0.00%	20.63%
Abortion				
0	8	57.14	31.22%	83.07%
I	5	35.71	10.61%	60.81%
II	1	7.14	0.00%	20.63%
Family History				
Diabetes + HBP	2	14.29	0.00%	32.62%
No alteration	10	71.43	47.76%	95.09%
NR	2	14.29	0.00%	32.62%
VDRL				
Positive	1	7.14	0.00%	20.63%
Negative	13	92.86	79.37%	106.35%

HBP: high blood pressure; UTI: urinary tract infection; NR: no response.

DISCUSSION

The prevalence of HIV infection among pregnant women was 0.78% (14/1795). In Brazil, the prevalence of HIV infection among pregnant women is 0.6% (Ministry of Health, 2007). From January 2001 to December 2003, the prevalence of HIV infection among pregnant women in the municipality of Campos dos Goytacazes was 0.5%[9,10], very close to the national average of 0.6%. This high prevalence of 0.78% in this study can be explained possibly due to the fact that it was performed in a maternity that is reference in high-risk pregnancy and because of the greater uptake of pregnant women through the rapid test. It is noteworthy that the prevalence of 0.78% (7.8 cases for 1,000 births) is almost double the prevalence in the state of Rio de Janeiro in 2014[1].

This study demonstrated that the predominant age group of pregnant women infected with HIV is between 19 and 25 years. Data from the Ministry of Health published in the Epidemiological Bulletin of 2015 corroborate our findings, although an increase in the number of cases over 40 years has been observed in the last decade[1]. Thus, most of these women are of reproductive age, which implies a greater concern about the effects of HIV infection on their health and the risk of mother-to-child transmission[1]. In addition, none of the patients was married, which increases the chance of multiple sexual partners, the possibility of alcohol and drug use as a reflection of their greater vulnerability, and consequent increase in the risk of HIV acquisition[11].

Regarding race, there was a divergence of this study from the national data for 2014: predominance of black (50% - 7/14) and brown pregnant women (42.86% - 6/14). In the mentioned study, 45.1% were brown, 38.7% white and 15.3% black[1]. This difference can be explained by the predominance of the black and brown races in the municipality, according to data from the 2010 IBGE Census[12]. In the mentioned Census, 50.7% of the Campos dos Goytacazes population is brown (36.6%) or black (14.1%). Those who declared themselves white in the same Census were 48.5%. The difference of 0.8% self-reported as yellow or indigenous[12]. Another aspect analyzed, which also agreed with the literature, was the type of delivery: of the total number of HIV-positive pregnant women, 71.43% (10/14) chose cesarean sections. According to Boer et al., the protective effect of the cesarean delivery scheduled before labor begins shows a 50% reduction in the risk of mother-to-child transmission[13].

Table 3 – Prenatal care and number of consultations of pregnant women infected with HIV.

Prenatal				
Yes	10	71.43%	47.76%	95.09%
No	1	7.14%	0.00%	20.63%
NR	3	21.43%	21.49%	42.92%
No. Of consultations				
0	1	7.14%	0.00%	20.63%
1 to 3	1	7.14%	0.00%	20.63%
4 to 6	4	28.57%	4.91%	52.24%
7 to 10	5	35.71%	10.61%	60.81%
11 to 13	0	0.00%	0.00%	0.00%
NR	3	21.43%	0.00%	42.92%

NR: no response.

Regarding syphilis, national prevalence in pregnant women was of 1.6% (about four times higher than HIV infection), according to the 2004 *Estudo Sentinela Parturiente Study*[5]. Epidemiological surveillance of syphilis in pregnancy has revealed a decline in the prevalence of syphilis in pregnancy but points to failures in prenatal care, both in the serological test and in the treatment of pregnant women and their partners, indicating the loss of important opportunities for the strategic actions necessary to control the disease[8]. In the present study, 7.14% (1/14) of the HIV-positive pregnant women also presented positive VDRL. The use of rapid tests for the diagnosis of HIV infection and syphilis in pregnancy has been shown to be an effective strategy in implementing new measures to address these infections during prenatal care and delivery, thus reducing mother-to-child transmission[14,15].

Of the pregnant women analyzed, 71.43% had undergone prenatal care, with a number o appointments ranging from 4 to 6 in 28.57% of cases (4/14), and from 7 to 10 in 35.71% (5/14). The main indicator of prognosis at birth is prenatal care, which aims to ensure the development of gestation, allowing for the delivery of a healthy newborn, without impact on maternal health, including psychosocial aspects and educational and preventive activities[5]. Pregnant women with HIV enter the classification of patients with gestational risk factors. They should be referred to high-risk prenatal and obstetric emergencies, and need to receive follow-up from the outreach team, with their returns monitored at the high-risk outpatient clinic[5]. Thus, pregnant women have access to a clinical priority, which facilitates the management of spontaneous demand and, consequently, causes an impact in the natural history of severe acute diseases, which can lead to death if not prioritized[5]. According to the World Health Organization (WHO)[6], the appropriate number of prenatal visits would be equal to or greater than six. However, the results found in the present study were that 35.71% (5/14) of the patients performed 7 to 10 consultations. The others were close to the expected - 28.57% (4/14) with 4-6 consultations, or less than recommended in the WHO.

CONCLUSION

The evaluation of HIV infection among pregnant women treated with HPC demonstrated a higher prevalence than the national average, with the exception that the study was performed in a high-risk gestational health unit. Its epidemiological characteristics were similar to those observed in the rest of the country.

Conflict of interests

The authors declare there was no conflict of interests.

REFERENCES

1. Brasil. Ministério da Saúde. Boletim Epidemiológico HIV-AIDS. Brasília, 2015. ano IV, n. 1.
2. UNAids. A global overview of the AIDS epidemic. 2009 [citd 2013 Setembro 8]. Available from: http://data.unaids.org/pub/Report/2009/JC1700_Epi_Update_2009_en.pdf
3. El Beitune P, Duarte G, Quintana SM, Figueiró-Filho EA. HIV-1: maternal prognosis. Rev Hosp Clin. 2004 [cited 2013 Setembro 3];59(1). Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0041-87812004000100005&lng=en

4. De Cock KM, Fowler MG, Mercier E, de Vincenzi I, Saba J, Hoff E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. JAMA. 2000;283(9):1175-82.
5. Souza-Júnior PRB, Szwarcwald CL, Barbosa Júnior A, Carvalho MF, Castilho EA. Infecção pelo HIV durante a gestação: Estudo-Sentinela Parturiente. Brasil. Rev Saúde Públ. 2004;38(6):764-72.
6. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Atenção ao pré-natal de baixo risco. Brasília: Ministério da Saúde; 2012 [cited 2013 Outubro 28]. Available from: http://dab.saude.gov.br/portaldab/biblioteca.php?conteudo=publicacoes/cab32
7. Silva MMG. Características das gestantes infectadas pelo HIV, de acordo com o momento do seu diagnóstico. Rio Grande do Sul. Dissertação [Mestrado em Medicina – Epidemiologia] – Universidade Federal do Rio Grande do Sul; 2007 [cited 2013 Março 14]. Available from: http://www.ibge.gov.br/home/estatistica/populacao/condicaodevida/indicadoresminimos/conceitos.shtm
8. Ribeiro Júnior JJ. Análise estatística no SAEG. Viçosa, MG, Universidade Federal de Viçosa; 2001. 301p.
9. Araújo LC, Fernandes RC, Coelho MC, Medina-Acosta E. Prevalência da infecção pelo HIV na demanda atendida no Centro de Testagem e Aconselhamento na Cidade de Campos dos Goytacazes, estado do Rio de Janeiro, Brasil, 2001-2002. Epidemiol Serv Saúde. 2005;14(2):85-90.
10. Araújo LC. Prevalência da infecção pelo HIV no Centro de Testagem e Aconselhamento de Campos e transmissão materno-infantil do HIV no município de Campos dos Goytacazes, Rio de Janeiro. Campos dos Goytacazes. Tese [Doutorado] – Universidade Estadual do Norte Fluminense Darcy Ribeiro; 2006 [cited 2013 Outubro 25]. Available from: http://www.uenf.br/Uenf/Downloads/PGBB_6650_1241548585.pdf
11. Calleja JM, Walker N, Cuchi P, Lazzari S, Ghys PD, Zacarias F. Status of the HIV/AIDS epidemic and methods to monitor it in Latin America and Caribbean region. AIDS. 2002;16(Supl 3):S3-12.
12. Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2010. Brasília; 2010 [cited 2013 Setembro 7]. Available from: http://www.ibge.gov.br/home/estatistica/populacao/condica devida/indicadoresminimos/conceitos.shtm
13. Boer K, England K, Godfried MH, Thorne C, Newell ML, Mahdavi S, et al. Mode of delivery in HIV-infected pregnant women and prevention of mother-to-child transmission: changing practices in Western Europe. HIV Med. 2010;11(6):368-78.
14. Saraceni V, Domingues RMSM, Vellozo V, Lauria LM, Dias MAB, Ratto KMN, et al. Vigilância da sífilis na gravidez. Epidemiol Serv Saúde. 2007;16(2):103-11.
15. Miranda AE, Rosetti Filho E, Trindade CR, Gouvêa GM, Costa DM, Ge Oliveira T, et al. Prevalência de sífilis e HIV utilizando testes rápidos em parturientes atendidas nas maternidades públicas de Vitória, estado do Espírito Santo. Rev Soc Bras Med Trop. 2009;42(4):386-91.

Correspondence address:
DÉBORA MOREIRA BRAVIN
Rua Nilton Vieira Novaes, 13 – Bosque dos Eucaliptos.
São José dos Campos (SP), Brasil
CEP: 12233-100
Tel: +55 (12) 98231-8585
E-mail: mbdebora@yahoo.com.br

ALINE GUEDES COZENDEY
Rua Dr. Lacerda Sobrinho, 184, Apto. 503 – Centro.
Campos dos Goytacazes (RJ), Brasil.
CEP: 28010-077
Tel: +55 (22) 99976-7642
E-mail: alinecozendey@yahoo.com.br

Received on: 03.12.2016
Approved on: 08.15.2016

College students and HIV infection: a study of sexual behavior and vulnerabilities[1]

Estudantes universitários e a infecção pelo HIV: um estudo sobre comportamento sexual e vulnerabilidades

Rodolfo Silva Bertoli[2], Carlos Edson Scheidmantel[3], Newton Sergio De-Carvalho[4]

ABSTRACT

Introduction: Adolescence is marked by emotional, social and physical changes. In this stage of development, vulnerable individuals tend to engage in risk behaviors related to the use of alcohol and drugs as well as unprotected sex. **Objective:** To evaluate the attitude of university students with regard to sexually transmitted infections (STIs) and the influence of the university environment in this behavior. **Methods:** Standardized questionnaires were applied anonymously in classrooms by a trained team. The first group of respondents was made up of freshmen (first year college students) while the second group was composed of seniors (fourth year students) from 11 of the areas of the Universidade Federal do Paraná (UFPR). From a total of 1,459 respondents, 1,350 were included. The questionnaire applied was based on the Pesquisa de Conhecimentos, Atitudes e Práticas na População Brasileira de 15 a 64 anos (PCAP - Survey of Knowledge, Attitudes and Practices among the Brazilian Population aged from 15 to 64 years) of 2008, conducted by the STI, AIDS and Viral Hepatites Sector of the Health Surveillance Department of the Ministry of Health (MOH). The questionnaire was modified and adapted to the survey on vulnerability to AIDS/HIV infection, STIs, and unplanned pregnancy among UFPR students. **Results:** Of the 1,350 students covered, 1,070 (79.2%) had already had sexual intercourse at least once in their lives (74.9% of freshmen and 86.8% of seniors). 76.3% of female respondents and 82.7% of males had already started their sexual life. Out of the the 507 freshmen who had vaginal sex, 42.0% did not wear a condom, compared to 56.7% of 363 seniors ($p<0.0001$). Similar results are observed in relation to oral sex, where 94,9% of senior students wore condoms less often than freshmen (88,6%) ($p=0.0021$). A total of 273 people answered to both questions about HIV testing and unprotected vaginal sex in the past 12 months. Out of the 163 students who did not wear condoms, 55.2% undertook an HIV test in the period analyzed. On the other hand, only 41.8% of the 110 students who wore condoms during that period took HIV tests ($p=0.0359$). **Conclusion:** High-risk sexual behavior and poor risk assessment mark the profile of students participating in this study. The young people exposed are not aware of their real vulnerability. The university does not act as a protective factor for these students. For adolescents, many other factors surpass the risk of acquiring an STD. The university can and should contribute more effectively in raising awareness and promoting the health of their students.

Keywords: STI; AIDS; vulnerability; students; adolescents.

RESUMO

Introdução: Transformações emocionais, sociais e físicas marcam a adolescência. Nessa fase do desenvolvimento, o indivíduo mais vulnerável tende a se envolver em comportamentos de risco relacionados ao uso de álcool e drogas assim como em situações de sexo sem proteção. **Objetivo:** Avaliar as atitudes dos universitários em relação às doenças sexualmente transmissíveis (DST) e a influência da universidade nesse comportamento. **Métodos:** Questionários padronizados foram aplicados de forma anônima por uma equipe treinada, nas salas de aula, direcionados para: um primeiro grupo formado de calouros (alunos do primeiro ano de faculdade) e um segundo grupo formado de veteranos (alunos do quarto ano de faculdade) de 11 setores que compõem a Universidade Federal do Paraná (UFPR), sendo que o cálculo amostral definiu um total de 1.459 estudantes, sendo incluídos 1.350. Esse questionário foi baseado na Pesquisa de Conhecimentos, Atitudes e Práticas na População Brasileira de 15 a 64 anos (PCAP) de 2008, realizado pelo Ministério da Saúde (MS), Secretaria de Vigilância em Saúde Departamento de DST, Aids e Hepatites Virais. O questionário foi modificado e adaptado para a pesquisa sobre Vulnerabilidades às DST, infecção pelo HIV/Aids e gravidez não planejada entre estudantes universitários da UFPR. **Resultados:** Dos 1.350 estudantes abordados, 1.070 (79,2%) já tiveram relação sexual alguma vez na vida (74,9% dos calouros e 86,8% dos veteranos). Em relação ao gênero, 76,3% das mulheres e 82,7% dos homens já haviam iniciado a vida sexual. Dos 507 calouros que fizeram sexo vaginal, 42,0% não usaram camisinha, contra 56,7% dos 363 veteranos ($p<0,0001$). Cenário semelhante observa-se em relação ao sexo oral, sendo novamente os veteranos os que fizeram menor uso de proteção em relação aos calouros, 94,9 *versus* 88,6% ($p=0,0021$). O total de 273 pessoas respondeu ambas as questões sobre testagem para o HIV e sobre a prática de sexo vaginal desprotegido nos últimos 12 meses. Dos 163 universitários que não utilizaram preservativo, 55,2% fizeram a testagem no período. Por outro lado, dos 110 que utilizaram preservativo naquele período, apenas 41,8% testaram-se para o HIV ($p=0,0359$). **Conclusão:** Comportamento sexual de risco e deficiente autopercepção de vulnerabilidade marcam o perfil dos universitários participantes deste estudo. Os jovens expostos não têm consciência da sua real vulnerabilidade. A universidade não atua como fator protetor para esses estudantes. Para os adolescentes, há muitos fatores que se sobrepõem ao risco de adquirir uma DST. A universidade pode e deve contribuir de maneira mais efetiva na conscientização e na promoção da saúde de seus estudantes.

Palavras-chave: DST; AIDS; vulnerabilidade; estudantes; adolescentes.

INTRODUCTION

Part of adolescence and early adulthood occurs within the university environment, a place for intellectual growth and responsible in large part for students' personal development. This period is characterized by emotional, social and physical changes that may expose young people to emotional and health risks. During this period of development, young people tend to engage in risk behaviors, such as the use of alcohol and drugs as well as unprotected sexual relations[1]. Students are exposed to new experiences, friendships and challenges; they seek identity, group belonging and adherence to standards. It is therefore a moment of great vulnerability.

Studies show that, despite media outreach and information, adolescents and young people still have doubts about how to prevent transmission of HIV and other sexually transmitted infections (STIs),

[1]Study conducted at the Department of Obstetrics and Gynecology at the Universidade Federal do Paraná.

[2]Medicine Graduate, Universidade Federal do Paraná (UFPR) - Curitiba (PR), Brazil
[3]Department of Obstetrics and Gynecology, UFPR - Curitiba (PR), Brazil
[4]Full Professor, Gynecology and Obstetrics Department, Infectious Disease in G&O Sector, Clinics Hospital University Federal of Parana (UFPR) - Curitiba (PR), Brazil

showing resistance to condom use, thus increasing their vulnerability and the incidence of such diseases[2].

In addition, alcohol use reduces decision-making ability and decreases the chances of rejection for unwanted sexual activities, which may lead to pregnancy and transmission of STIs/HIV and multiple sexual partners[3]. In Latin America, there are approximately 1.4 million cases of HIV infection, over half of which are in Brazil[4] and stem from casual sex [5]. Among young people (aged 13 to 19 years), the number of AIDS cases is higher in females than in males, in contrast with the gender distribution for other age groups.

The latest Ministry of Health STI and AIDS epidemiological newsletter highlights that the increase of AIDS incidence among young people (15 to 24) is still a major concern and that counteractions should be intensified[6].

OBJECTIVE

To evaluate the attitude of university students with regard to sexually transmitted infections (STIs) and the influence of the university environment in this behavior. These attitudes and behaviors were assessed by comparing responses of two groups of college students: group 1 (G1) was composed of freshmen (students of the 1st and 2nd semesters) while group 2 (G2) was composed of veterans (students of the 7th and 8th semesters).

METHODS

A cross-sectional study was carried out with data from a questionnaire based on the 2008 "Pesquisa de Conhecimentos, Atitudes e Práticas na População Brasileira de 15 a 64 anos" (PCAP - Survey of Knowledge, Attitudes and Practices among the Brazilian Population aged from 15 to 64 years) conducted by the STI, AIDS and Viral Hepatites Sector of the Health Surveillance Department of the Ministry of Health (MOH). The questionnaire was modified and adapted to the survey on vulnerability to AIDS/HIV infection, STIs, and unplanned pregnancy among UFPR students. The material used in the study was prepared by two professors of medicine at UFPR, one of them a sexologist and the other a gynecologist specialized in female infections.

The sample size comprised 1,459 students from 11 of the sectors that make up the university, 913 of which were freshmen (1st and 2nd semesters) and 546 seniors (7th and 8th semesters). 10 questionnaires were not applied due to student absence at the time of the survey. 94 were discarded because they were answered by students outside the groups specified (e.g. sophomores). 4 other questionnaires were disqualified due to missing pages and 1 was incomplete. This resulted in 1,350 valid questionnaires for inclusion in the study: 859 freshmen and 491 seniors. This sample size allowed for an inference with a margin of error of 2.39% for the UFPR student population and 7% for each of the 11 sectors surveyed. The confidence level was set at 95%.

The anonymous standardized questionnaires were applied in classrooms by a trained team on both freshmen and senior students. Survey participants responded to questions about sexual behavior, including questions about use of condoms in sexual relations, which were used to determine the actual vulnerability to STIs. Students also responded on their self perception of vulnerability, sorting their chances of acquiring an STI at that moment in life as none, low, moderate or high. On average, students took 25 minutes to answer the questionnaire. The training of the team of student volunteers who applied the questionnaires was divided in four stages, in a theoretical-practical course named "Training for conduction of scientific research survey," in which the students came into contact with the goals of the project, received instruction concerning data collection, simulated application of questionnaires in groups of two and finally performed a pretest, with critical evaluation of the survey itself. Volunteers also received instructions on Best Practices in Clinical Research and Ethics in Research.

The protocol was reviewed and approved by the Ethics Committee of the Hospital de Clínicas of UFPR (CEP/HC), under protocol number 2645.252/2011-11, with the requirement that participants answered anonymously and were allowed to leave questions blank, to refuse to participate or to stop participation at any time.

Response data was assembled in Microsoft Excel 2013 and processed with the software GraphPad Prism version 7.0 for OSX (GraphPad Software), with an estimated confidence interval of 95%. To investigate the association between categorical variables, Fisher or χ^2 tests were used, with a statistical significance level set at under 0.05.

RESULTS

620 (46%) of the 1,350 students included in the study were male and 730 (54%), female. The average respondent age was 21.42 years (±4.75 years). Specifically, the average was 20.55 years for freshmen (G1) and 22.92 for seniors (G2).

1,070 (79.2%) of them had already had sexual intercourse at least once in their lives (74.9% of G1 and 86.8% of G2). With regard to their sexual orientation, 59 (4.4%) of students were bisexual, 1,234 (91.4%) were heterosexual and 54 (4%) were homossexual. Three students chose not to answer that question. 88.1% of bisexuals, 79% of heterosexual and 92.6% of homosexuals had already started their sexual life. 974 (72.1%) students, 67.5% of which belonged to G1 and 80.1% to G2, had at least one sexual intercourse in the past 12 months. 76.3% of girls and 82.7% of boys had already had sexual intercourse at least once.

797 (59.0%) of students declared to have performed oral sex, while 870 (64.5%) performed vaginal sex and 310 (23.0%) performed anal sex. 727 (91.2%) of students who performed oral sex did not wear protection. 417 (47.9%) of the 870 respondents who had performed vaginal sex and 190 (61.3%) of the 310 who had performed anal sex also did not make uso of protective methods during sexual intercourse.

There was no significant difference in the use of protection in oral sex, namely, 92.5% of women and 89.8% of men did not wear any protection for this practice. In both vaginal and anal sex, women declared to make use of condoms less often than men. While 53.3% of females had had unprotected vaginal sex and 68.1% had had unprotected anal sex, these figures were lower for men: 41.3% for vaginal sex and 55.8% for anal sex.

There were no differences over condom use in anal sex between the two groups (G1 and G2, p=0.34). However, 42.0% of the 507 freshmen who had had vaginal sex did so without protection, in contrast with 56.7% of 363 seniors (p<0.0001). A similar scenario is observed in relation to oral sex, where once again seniors were seen to make use of protection less often if compared to freshmen: 94.9 (G2) *vs.* 88.6% (G1) (p=0.0021). The percentages of condom use among different sexual practices for both freshmen and seniors can be observed in **Chart 1**.

A total of 273 people answered to both questions about HIV testing and unprotected vaginal sex in the past 12 months. Out of the 163 students who did not wear condoms, 55.2% undertook an HIV test in the period analyzed. On the other hand, only 41.8% of the 110 students who wore condoms during that period took HIV tests (p=0.0359).

There was no association between perceived and real vulnerability, when comparing responses related to unprotected oral (p=0.8452), vaginal (p=0.1203), and anal sex (p=0.5411) (**Table 1**). This dissociation between unsafe sexual practices and self perception of vulnerability can be observed in **Chart 2**.

When comparing the data related to the self perception of vulnerability and HIV testing (**Chart 3**), we can see that there is no difference in test taking behavior between those who believe to be in great/moderate vulnerability (46.3% took the test) and those who perceive to have little to no vulnerability (47.8% took the HIV test).

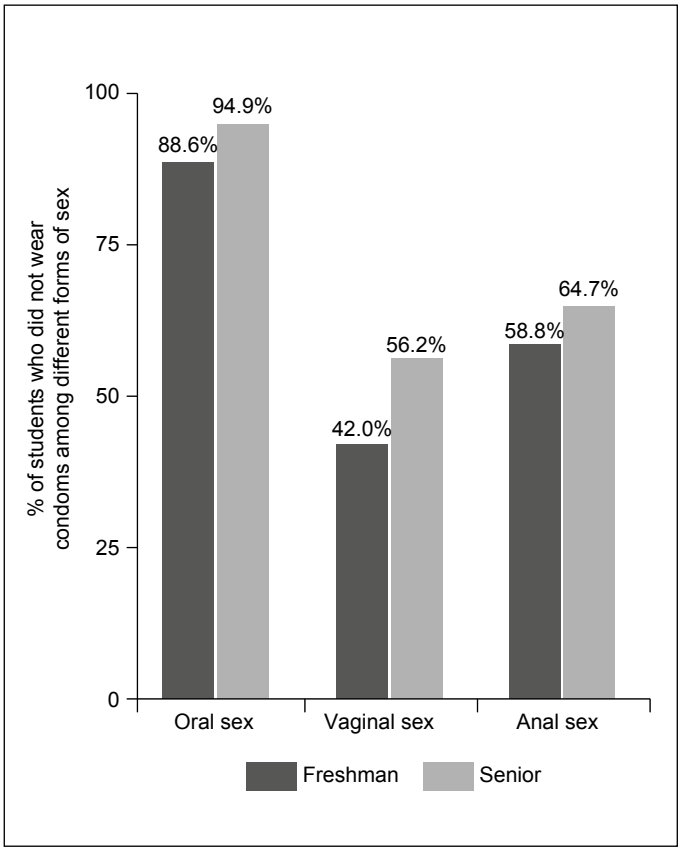

Chart 1 – Percentage of condom use among different forms of sex between freshmen and seniors.

Another aspect analyzed was the relationship between the type of relationship (fixed partner or causal relationship) and condom use (**Chart 4**). In all three different forms of sex addressed in research (anal, vaginal and oral), the use of condoms was lower among people engaged in stable relationships (p<0.0001).

DISCUSSION

The spread of HIV has become a serious public health concern and should be taken into account by adolescents, for it is at this stage that potentially hazardous sexual behaviors start to take place[6,7].

Unprotected sex is not an issue only among Brazilian adolescents. Data from a survey conducted yearly by the USA *National Survey on Youth Risk Behavior* showed less alarming, but no less worrying figures. Data from the period between 1991 and 2011 indicated that condom use among sexually active students increased from 46.2% in 1991 to 60.2% in 2011 for both genders. However, 40.0% of adolescents (males and females) were still involved in unprotected sexual relations[8]. A similar scenario is observed with the population of this study, in which the rate of condom use during vaginal sex was of 52.1%, i.e., 47.9% of students still engage in unprotected vaginal sexual intercourse. The situation was even more worrying in relation to anal and oral sex, where the lack of barrier methods was declared by 61.3 and 91.0% of respondents.

Dahl[9] noted that, during puberty, changes in the neuronal system, responsible for emotions and motivations, facilitate an increase of risk behaviors. At this stage, adolescents are seeking new experiences that generate pleasure, but the sense of omnipotence may cause a lack of awareness of the consequences of the actions undertaken. There was a positive association between unprotected vaginal sex and HIV testing: 55.2% of students who had had unprotected sex took an HIV test, while only 41.8% of those who wore a condom took HIV tests.

However, despite this significant relationship between unprotected vaginal sex and HIV testing, it was observed that students are unable to assess their actual vulnerability. The self perception of vulnerability was not consistent with the risk behavior in all three forms of sex analyzed. In addition, there was no significant difference in HIV testing behavior among the groups that considered themselves under great/moderate vulnerability and those who believed to be under little to no vulnerability to this infection.

A study conducted by Sanchez et al.[10] showed that young females are more likely than young males to perform unprotected sex, a result that may explain the higher proportion of female adolescents infected with HIV if compared to males of the same age[6]. Among the undergraduates participating in the survey, there was no significant difference between genders over the use of protection during oral sex. On the other hand, women surveyed made use of condoms during vaginal and anal sex less often if compared to men.

According to Johnston et al.[7], young females are more engaged in monogamous relationships and feel more secure about the risks connected with STIs/AIDS. However, another hypothesis suggests

that infatuation and alcohol or drug use may blind young females to the risks of unprotected sex, even when they are aware of the possibility of contracting HIV[11]. The fact is that, in all three sex practices evaluated in the present study, people involved in steady relationships made use of condoms less often than those who engaged in casual relationships, making steady relationships a risk factor for the practice of unprotected sex and possible STI infections.

Love does not always appear to be directly related to the perception of risk. However, along with steady dating, love presented itself as a form of justification for unprotected sex, being related to the underestimation of the risk posed by partners. It was observed that stable relationships are a factor that increase vulnerability to HIV, as partners' mutual confidence is used as a justification for risk behavior, such as the lack of condom use[12]. Trust in the partner is used by adolescents as an ersatz for barrier methods[13].

The survey made it clear that seniors tend to take higher risks in sexual behavior if compared to freshmen, engaging in unprotected vaginal and oral sex more frequently. There is a clear dissociation between academic knowledge and self-care in relation to sexual health, which reinforces the idea that students need education and prevention programs in the context of health education. Specific actions should focus on improving adolescents' decision-making skills by including techniques to promote safer sexual behaviors among young females. However, according to a recent systematic review[14], aimed at evaluating approaches for reducing risk behaviors associated with drug use and unprotected sex, interventions that spanned multiple risk areas (individual sphere as well as family, school and community environments) and protective factors against risk behaviors were more promising than programs that addressed only one domain (i.e. either school, or family or individual).

This research is relatively exempt of biases, as it was performed with great methodological rigor and assessed a uniform population of 11 sectors of a university that comprises approximately 38,000 students. In addition, the voluntary staff underwent rigorous training through instruction regarding all details involved

Table 1 – actual vulnerability and self-perception of vulnerability in relation to high-risk sexual behavior among students of the Universidade Federal do Paraná.

Perception Of Vulnerability	Anal Sex		Vaginal sex		Oral Sex	
	Protected	Unprotected	Protected	Unprotected	Protected	Unprotected
Great/Moderated	23 (42.6%)	31 (57.4%)	40 (44.5%)	50 (55.6%)	7 (7.4%)	87 (92.6%)
Low/no	96 (38.0%)	157 (62.0%)	413 (53.2%)	364 (46.8%)	62 (8.9%)	637 (91.1%)
P-value	0.5411		0.1203		0.8452	

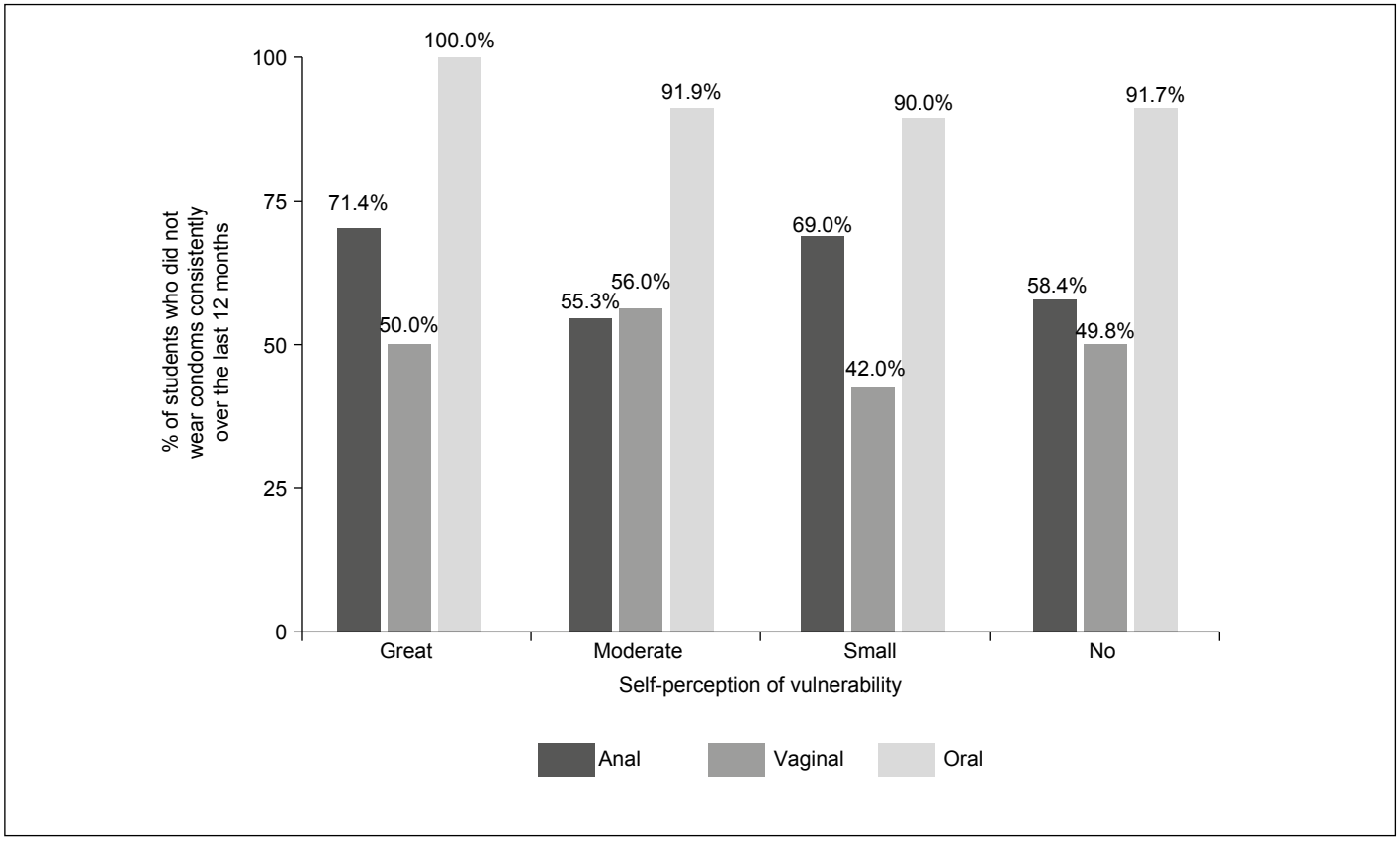

Chart 2 – Self-perception of vulnerability and inconsistent use of condoms in different forms of sex in the last 12 months.

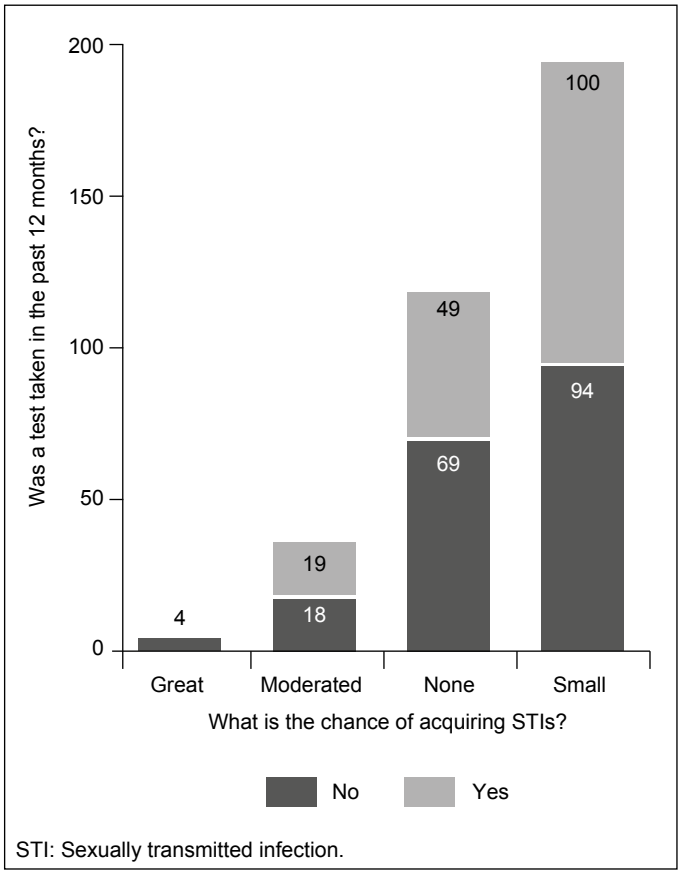

Chart 3 – Self-perception of vulnerability and testing.

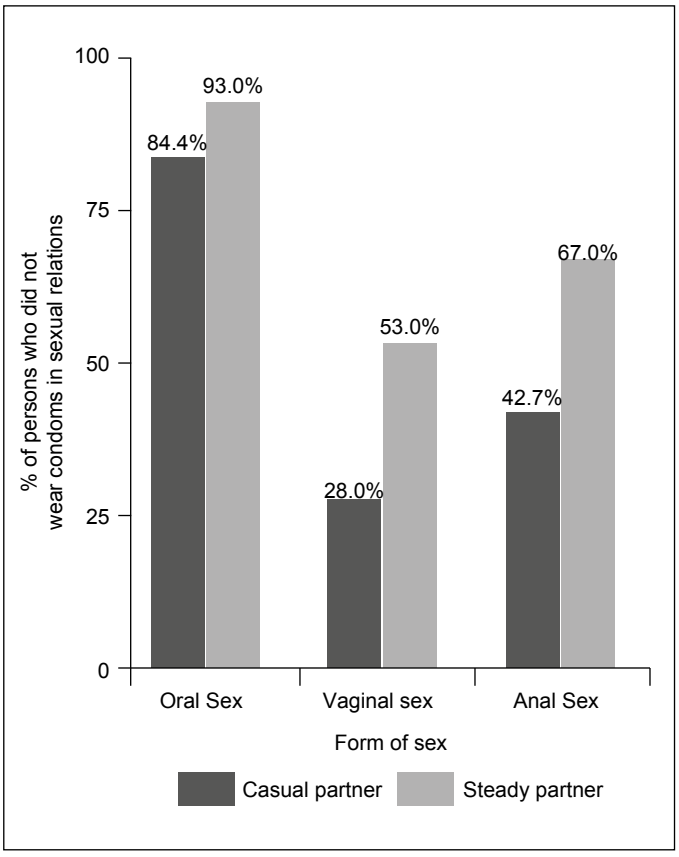

Chart 4 – Type of relationship and lack of condom use by form of sex.

in the development of survey-based research. There was also careful organization and collaboration of the university administration and each schools, in order to allow for a smooth and adequate conduction of the survey, averting most of the confounding factors that may arise at the time of filling (i.e. rooms were provided to ensure the secrecy and individuality, with adequate time, without prejudice to academic activities). The questionnaire had already been validated in other situations and, above all, it had the endorsement of the STI, AIDS and Viral Hepatites Sector of the Ministry of Health. Although research with extensive questionnaires may elicit distorted answers (due to exhaustion during the survey), this bias was diluted by the size and homogeneity of the sample, in addition to the standardization on how to complete the form.

Finally, the vulnerability of university students in relation to STIs became clear, whether they are freshmen or seniors. The university, considered a temple of knowledge, does not act as a protective factor in this matter. The need for actions and programs focused on sexual education and self care within the academic environment becomes evident, as it may help preventing diseases and promoting healthy practices. This awareness of students' lack of attention to health led to the creation of a extra-curricular project named "Projeto Universitário Saudável" (or "Healthy Student Project"). This project was conceived by professors of the Department of Obstetrics and Gynecology of the UFPR and was undertaken with the help of medical students of the same institution. Its actions, aimed at all UFPR students, make use of peer-education methods and attempt to promote UFPR students' health by preventing STI/AIDS and unplanned pregnancy by encouraging students to adopt behaviors that prioritize self care.

CONCLUSION

High-risk sexual behavior and poor perception of vulnerability marked the profile of students participating in this study. The young men and women demonstrated a lack of awareness of their real vulnerability. The university has not been shown to act as a source of protective factors against the main sexually transmitted infections. Among adolescents, there are many factors that surpass the risk of acquiring an STI. The university can and should contribute more effectively in raising awareness and promoting students' health.

Conflict of interests

The authors declare no conflict of interest.

Financing

The material used in the study was funded through an agreement between the Universidade Federal do Paraná and the Fundação Araucária.

REFERENCES

1. Pharo H, Sim C, Graham M, Gross J, Hayne H. Risky business: executive function, personality, and reckless behavior during adolescence and emerging adulthood. Behav Neurosci. 2011 Dec;125(6):970-8. doi: 10.1037/a0025768
2. Nader SS, Gerhardt CR, Nader PJH, Pereira DN. Juventude e AIDS: conhecimento entre os adolescentes de uma escola pública em Canoas, RS. Rev AMRIGS. 2009;53(4):374-81.
3. Griffin KW, Scheier LM, Acevedo B, Grenard JL, Botvin GJ. Long-term effects of self-control on alcohol use and sexual behavior among urban minority young women. Int J Environ Res Public Health. 2012 Jan;9(1):1-23. doi: 10.3390/ijerph9010001
4. Teva I, Bermúdez MP, Ramiro MT, Buela-Casal G. Current epidemiological situation of HIV/AIDS in Latin America: analysis of differences among countries. Rev Med Chil. 2012 Jan;140(1):50-8. doi: /S0034-98872012000100007
5. Dourado I, Veras MASM, Barreira D, Brito AM. AIDS epidemic trends after the introduction of antiretroviral therapy in Brazil. Rev Saúde Públ [Internet]. 2006 Apr [cited 2016 Oct 19];40(Suppl):9-17.
6. Brasil. Ministério da Saúde. Departamento de DST, AIDS e Hepatites virais. Boletim epidemiológico HIV/AIDS. Brasília, 2015 [cited 2016 Oct. 6]. Available from: http://www.aids.gov.br/sites/default/files/anexos/publicacao/2015/58534/boletim_aids_11_2015_web_pdf_19105.pdf
7. Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. HIV/AIDS: risk & protective behaviors among American young adults, 2004–2008 (NIH Publication No. 10-7586). Bethesda, MD: National Institute on Drug Abuse; 2010.
8. Kann L, Lowry R, Eaton D, Wechsler H. Trends in HIV-related risk behaviors among high school students — United States, 1991–2011. 2012 [cited 2016 Aug. 13];61(29):556-560. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6129a4.htm
9. Dahl RE. Adolescent brain development: a period of vulnerabilities and opportunities. Keynote address. Ann N Y Acad Sci. 2004;1021:1-22.
10. Sanchez ZM, Nappo SA, Cruz JI, Carlini EA, Carlini CM, Martins SS. Sexual behavior among high school students in Brazil: alcohol consumption and legal and illegal drug use associated with unprotected sex. Clinics [Internet]. 2013 Apr [cited 2016 Oct 19];68(4):489-94. doi: 10.6061/clinics/2013(04)09
11. Christianson M, Lalos A, Westman G, Johansson EE. "Eyes Wide Shut" — sexuality and risk in HIV-positive youth in Sweden: a qualitative study. Scand J Public Health. 2007 Jan;35(1):55-61. doi: 10.1080/14034940600812943
12. Aguiar A, Camargo BV. Romantic relationships, adolescence and HIV: love as an element of vulnerability. Paidéia. 2014;24(58):165-76. doi: http://dx.doi.org/10.1590/1982-43272458201404
13. Anjos RHD, Silva JAS, Val LF, Rincon LA, Nichiata LYI. Diferenças entre adolescentes do sexo feminino e masculino na vulnerabilidade individual ao HIV. Rev Esc Enferm USP [Internet]. 2012 Aug [cited 2016 Oct 19];46(4):829-37. doi: http://dx.doi.org/10.1590/S0080-62342012000400007
14. Jackson C, Geddes R, Haw S, Frank J. Interventions to prevent substance use and risky sexual behaviour in young people: a systematic review. Addiction. 2012 Apr;107(4):733-47. doi: 10.1111/j.1360-0443.2011.03751.x

Address for correspondence:
NEWTON SERGIO DE CARVALHO
Rua General Carneiro, 181
Alto da Glória
Curitiba (PR), Brasil.
CEP: 80060-900
Tel.: +55 (41) 3360-1865, ramal: 6176; +55 (41) 3360-1800, ramal: 6161
Fax: +55 (41) 3360-1865
E-mail: newtonsdc@gmail.com

Recebido em: 10.25.2016
Aprovado em: 11.26.2016

Letter to the Editor in Chief of STD (Brazilian Journal of Sexually Transmitted Diseases)

Vaccine against HPV in boys in the National Immunizations Program/2017

The Ministry of Health, through the National Immunizations Program (NIP), expanded, in 2014, the National Vaccine Calendar with the introduction of the quadrivalent vaccine against the Human Papillomavirus (HPV) in the Public Health System (SUS). The vaccination, in conjunction with current cervical cancer follow-up initiatives will allow for the prevention of this disease in the coming decades. Today, the disease represents the fourth main cause of death by neoplasms among women in Brazil, with an estimate of 15,000 cases and 5,000 deaths per year[1].

Initially, the vaccine was offered gradually to girls aged 9 to 13 years and to women aged 14 to 26 years living with HIV/AIDS. This age range for the young girls' vaccination aims at protecting them before they begin their sex life, and as such, before having contact with the virus.

Starting in January of 2017, the Ministry of Health will provide the vaccine against HPV for the male population between 12 and 13 years of age. The age range will be gradually expanded until 2020, when boys aged 9 to 13 years will be included. Men between 14 and 26 years who are living will aids will also be included in the initiative of the vaccination against HPV, in addition to girls aged 14 years who haven't been vaccinated yet.

The vaccination schedule for the teenagers will be in two doses, with a six-month interval between each one. For people living with HIV, the vaccination schedule is three in doses (interval of 0,2 and 6 months), and it is necessary to present a medical prescription.

It is important to highlight that the vaccine against HPV has proven to be extremely safe, and the adverse postvaccination events, when they are present, are mild and self-limited.

The decision to expand the vaccination to the male sex is in accordance with the recommendations provided by the Brazilian Societies of Pediatrics, Immunology, Obstetrics, Gynecology, Sexually Transmitted Diseases and by the Advisory Committee on Immunization Practices (USA)[2]. The strategy aims at protecting against cancer of the penis, throat, and anus, which are diseases that are directly related to HPV, in addition to protecting against anogenital warts.

HPV is the most common sexually transmitted disease. It is so prevalent that around 70 to 80% of sexually active men and women will be infected at some moment in their lifetime. There is a 50 to 80% chance of transmission of HPV after sexual intercourse without protection (use of a masculine or feminine preservative) with someone infected with HPV. It is estimated that in 3 to 10% of cases, especially among people with a compromised immune system (for example, because they are HIV-positive), the virus persists and can lead to serious health problems, especially for men that have sex with men (MSM). This is the group of men with the highest risk of HPV infection and its consequences, especially the MSM that are HIV positive[3,4].

A systematic review of the prevalence of genital HPV DNA in men examined data from men aged 18 years or older in Europe and North America. The prevalence of HPV was high in all of the regions, but it varied from 1 to 84% among low-risk men, and between 2 and 93% among high-risk men (those with an infection, for example, caused by a sexually transmitted disease, HIV-positive men, and partners of women with an HPV infection or abnormal cytology). More than 90% of anal cancer cases are attributed to HPV infection and are very common in MSM, and are almost universally present in those infected by HIV[5].

HPV infection can also compromise the oral cavity, in the subclinical presentation or by being associated with benign or malign oral neoplasms. The cancers of the throat and mouth are the sixth most prevalent type of cancer worldwide, with 400,000 cases per year and 230,000 deaths. The cases are two to three times more frequent in men than in women[6].

Benign oral legions associated with HPV occur in 0.5% of the population in general, but in up to 5% of the individuals living with HIV and up to 23% of those undergoing antiretroviral therapy[7].

It is noteworthy that the extension of the vaccine for boys will strengthen the health initiatives for the male population, and will affirm the shared responsibility of the Brazilian Health Ministry with respect to reproductive health questions between the genders. The broadening of access of the vaccine against HPV for both sexes will allow for the prevention of the sickness in the coming decades, impacting the epidemiological profile of the infections attributed to HPV.

Accordingly, the inclusion of boys in the vaccination against HPV will be an important tool for preventing cancer of the penis, anus, and throat and against genital warts. Furthermore, because they are responsible for transmitting the virus to their partners, upon receiving the vaccine, they are collaborating to reduce the incidence of cervical and vulva cancer, among others, in women.

As such, we are certain that the editorial W**hy Should We Vaccinate Boys and Men against HPV?**, published in STD – Brazilian Journal of Sexually Transmitted Diseases, volume 28, number 2, from 2016, written by the authors Nelson Vespa and Mauro Passos, will be of great relevance and will influence researchers, health professionals, public health managers and the population, as it enables free access to scientific periodicals concerning the everyday need for expanding initiatives to protect people against preventable infectious diseases.

CARLA MAGDA ALLAN S. DOMINGUES &
ANA GORETTI KALUME MARANHÃO
General Coordination of the National Immunization Program
Department of Transmissible Disease Surveillance - Health Surveillance Secretariat
Ministry of Health - Brazil
Tel: + 55 61 3213-8296
Email: carla.domingues@saude.gov.br
Email: ana.goretti@saude.gov.br

REFERENCES

1. Brasil. Instituto Nacional do Câncer José de Alencar Gomes da Silva. Estatísticas do Câncer de Colo do Útero [Internet]. 2015 [Cited 2016 Nov 16] Available from: http://www2.inca.gov.br/wps/wcm/connect/tiposdecancer/site/home/colo_utero/
2. JA. Centers for Disease Control and Prevention. Human Papillomavirus Vaccination: recommendations of the Advisory Committee on Immunization Practices. Recommendations and Reports. 2014;63(5) [Internet]. [Cited 2016 Nov 16] Available from: http://www.cdc.gov/mmwr/pdf/rr/rr6305.pdf Xu
3. HPV Action. Jabs for the boys: the case for gender-neutral HPV vaccination. [Internet]. 2015 [Cited 2016 Nov 16] Available from: http://www.hpvaction.org/uploads/1/7/8/5/17850843/jabs-for-boys-report.pdf
4. Sadlier C, Lynam A, O'Dea S, Delamere S, Quinlan M, Clarke S, et al. HPV vaccine acceptability in HIV-infected and HIV negative men who have sex with men (MSM) in Ireland. Hum Vaccin Immunother. 2016 Jun 2;12(6):1536-41. doi: 10.1080/21645515.2016.1151588
5. Schim van der Loeff MF, Mooij SH, Richel O, de Vries HJ, Prins JM. HPV and anal cancer in HIV-infected individuals: a review. Curr HIV/AIDS Rep. 2014;11(3):250-62 [Internet]. [Cited 2016 Nov 16] Available from: http://www.ncbi.nlm.nih.gov/pubmed/24990810
6. Stanley M. HPV vaccination in boys and men. Hum Vaccin Immunother. 2014 July;10(7):2109-11.
7. Cardial MFT. Uso da vacina contra papilomavírus humano em indivíduos com imunossupressão. Artigo de revisão. Rev Bras Patol Trato Genit Infer. 2012;2(2):83-7.

Joint Meeting of the 22nd ISSTDR and 18th IUSTI

STI&HIV Rio 2017
e DST 11 Aids 7

www.stihivrio2017.com

ISSTDR

IUSTI
INTERNATIONAL UNION AGAINST SEXUALLY TRANSMITTED INFECTIONS

SBDST

ACTIVIA
CONFERENCES & CORPORATE TRAVEL

Riveira Rio Eventos
Congressos · Simpósios
Cursos · Festas Temáticas
Eventos em geral

SBDST | Sociedade Brasileira de Doenças Sexualmente Transmissíveis

Esse lançamento você tem que conferir.

Novo portal da SBDST.

Mais seguro, moderno e informativo.

dstbrasil.org.br

Siga-nos:

http://dstbrasil.org.br

Ministério da Saúde
Secretaria de Vigilância em Saúde
Departamento de Vigilância, Prevenção e Controle das DST, Aids e Hepatites Virais

Combate à SÍFILIS CONGÊNITA

Agenda de Ações Estratégicas para Redução da Sífilis Congênita no Brasil

Brasília - DF
2016

SUBMIT YOUR ABSTRACT

Basic Science to Global Health Impact

HPV2017

31ST INTERNATIONAL PAPILLOMAVIRUS CONFERENCE

CAPE TOWN

FEBRUARY 28 – MARCH 5, 2017 | CAPE TOWN, SOUTH AFRICA

www.hpv2017.org