

Online ISSN 2317-4404

BJSCR

11(2)

June / August

2015



Título / Title: Brazilian Journal of Surgery and Clinical Research
Título abreviado/ Short title: Braz. J. Surg. Clin. Res.
Sigla/Acronym: BJSCR
Editora / Publisher: Master Editora
Periodicidade / Periodicity: Trimestral / Quarterly
Indexação / Indexed: Latindex, Google Acadêmico, Bibliomed, DRJI, Periódicos CAPES e EBSCO host.

Início / Start: Dezembro, 2012/ Decembrer, 2012

Editor-Chefe / Editor-in-Chief: Prof. Dr. Mário dos Anjos Neto Filho [MS; Dr]

Conselho Editorial / Editorial Board

Prof. Dr. Antonio Marcos dos Anjos Neto: **Instituto do Rim de Maringá** – Maringá – PR – Brasil
 Prof. Dr. Luciano Tavares Ângelo Cintra: **UNESP** – Araçatuba – SP – Brasil
 Prof. Dr. Luiz Fernando Lolli: **UEM e UNINGÁ** – Maringá – PR – Brasil
 Prof.Dr. Paulo Rodrigo Stival Bittencourt: **UFTPR** – Medianeira – PR – Brasil
 Prof. Dr. Jefferson José de Carvalho Marion: **UFMS** – MS - Brasil
 Prof. Dr. Aissar Eduardo Nassif: **UNINGÁ** - Maringá – PR – Brasil
 Prof. Dr. Sérgio Spezzia: **UNIFESP** – São Paulo – SP – Brasil
 Prof. Dr. Romualdo José Ribeiro Gama: **IPEMCE** - São Paulo- SP
 Profa. MS. Rosana Amora Ascari: **UDESC** – Chapecó - SC
 Prof. Dr. Ricardo Radighieri Rascado: **UNIFAL** – Alfenas – MG
 Prof. Dr. Edmar Miyoshi – **UEPG**– Ponta Grossa – PR
 Profa. Dra. Tatiliana Geralda Bacelar Kashiwabara – **IMES** – Ipatinga – MG
 Profa.MSD. Thais Mageste Duque – **UNICAMP** – SP, **UNINGÁ** - PR
 Prof. Dr. Sérgio Spezzia – **UNIFESP** – SP

O periódico **Brazilian Journal of Surgery and Clinical Research – BJSCR** é uma publicação da **Master Editora** para divulgação de artigos científicos apenas em mídia eletrônica, indexada às bases de dados **Latindex, Google Acadêmico, Bibliomed, DRJI, Periódicos CAPES e EBSCO host**.

Todos os artigos publicados foram formalmente autorizados por seus autores e são de sua exclusiva responsabilidade. As opiniões emitidas pelos autores dos artigos publicados não necessariamente correspondem às opiniões da **Master Editora**, do periódico **BJSCR** e /ou de seu Conselho Editorial.

*The **Brazilian Journal of Surgery and Clinical Research - BJSCR** is an editorial product of **Master Publisher** aimed at disseminating scientific articles only in electronic media, indexed in **Latindex, Google Scholar, Bibliomed, DRJI, CAPES Periodicals and EBSCO host** databases.*

*All articles published were formally authorized by the authors and are your sole responsibility. The opinions expressed by the authors of the published articles do not necessarily correspond to the opinions of **Master Publisher**, the **BJSCR** and/or its editorial board.*

Prezado leitor,

*Disponibilizamos a décima primeira edição, volume dois, do periódico **Brazilian Journal of Surgery and Clinical Research – BJSCR**.*

*A **Master Editora** e o **BJSCR** agradecem aos Autores que abrilhantam esta edição pela confiança depositada em nosso periódico. O **BJSCR** é um dos primeiros “Open Access Journal” do Brasil, representando a materialização dos elevados ideais da **Master Editora** acerca da divulgação ampla e irrestrita do conhecimento científico produzido pelas Ciências da Saúde e Biológicas.*

Aos autores de artigos científicos que se enquadram em nosso escopo, envie seus manuscritos para análise de nosso conselho editorial!

A décima primeira edição, volume três, estará disponível a partir do mês de Agosto de 2015!

Boa leitura!

Mário dos Anjos Neto Filho
Editor-Chefe BJSCR

Dear reader,

*We provide the eleventh edition, volume two, of the **Brazilian Journal of Surgery and Clinical Research - BJSCR**.*

*The **Master Publisher** and the **BJSCR** would like to thank the authors of this edition for the trust placed in our journal. The **BJSCR** is one of the early Open Access Journal of Brazil, representing the realization of the lofty ideals of the **Master Publisher** about the broad and unrestricted dissemination of scientific knowledge produced by the Health and Biological Sciences.*

Authors of scientific manuscripts that fit in the scope of BJSCR, send their manuscripts for consideration of our editorial board!

Our eleventh edition, volume three, will be available in August, 2015!

Happy reading!

Mário dos Anjos Neto Filho
Editor-in-Chief BJSCR



Master Editora

ORIGINAL STUDY**EPIDEMIOLOGICAL PROFILE OF PATIENTS REGISTERED IN THE PROGRAM HIPERDIA OF A BASIC HEALTH UNIT FROM IPATINGA, MINAS GERAIS, BRAZIL, IN 2012**

NAYANDRA SOUZA E SILVA, VERONICA MARQUES MATOS, FLÁVIO MENDONÇA PINTO 05

INCIDENCE OF ATRIAL FIBRILLATION IN POSTOPERATIVE CARDIAC SURGERY PATIENTS AT A UNIVERSITY HOSPITAL

RAFAELLA SANTOS MAFALDO, VITOR TAVARES PAULA, PEDRO VICTOR ALCÂNTARA DA COSTA, JULIO CESAR VIEIRA DE SOUSA, ADEMAR ALEXANDRE DE MORAIS, ROSIANE VIANA ZUZA DINIZ 11

PILATES PRINCIPLES IN LUNG FUNCTION IN PATIENTS IN CARDIAC SURGERY POSTOPERATIVE

ANDRÉ LUIZ CORDEIRO, ALEXSANDRA FERREIRA BARBOSA, LARISSA PEREIRA LEITAO, PRISCILA ANDRADE ARAUJO, SARAH CARVALHO, ANDRE RAIMUNDO GUIMARAES 16

INCIDENCE OF TUBERCULOSIS IN IPANEMA COUNTY, MINAS GERAIS STATE - 2009 TO 2014

MIRIAN CRISTINA DE OLIVEIRA, ARILTON JANUÁRIO BACELAR JÚNIOR, ARINIZA ANIELLE FÉLIX OLIVEIRA, KLEBER CORCETTI DUTRA RITA DE CÁSSIA GOMES, VALÉRIA GOMES SCHERRE CORCETTI 20

CASE REPORT – MEDICINE**TERTIARY SYPHILIS AS TRIGGERING FACTOR FOR POSTERIOR UVEITIS: A CASE REPORT**

GLEYTON GOMES PORTO, ELAINESILVERIO DE OLIVEIRA, EGUIMAR ROBERTO MARTINS, FÁBIO LAZARI, ANA CRISTINA MEDEIROS GURGEL 25

LITERATURE REVIEW**OPPORTUNISTIC DISEASES RELATION ON PATIENTS SEROPOSITIVE**

ARILTON JANUÁRIO BACELAR JÚNIOR, EUCILENE GONÇALVES DA SILVA, FLÁVIA LIMA FERREIRA, GERMANA MARIA MEDEIROS DE ASSIS, GIZIELE REIS DE ALMEIDA NUNES 28

PRIMARY HYPOLACTASIA - LITERATURE REVIEW

BRUNA CAROLINE PESSOA ANDRADE, ANA BEATRIZ GUEDES ALI, DANIELA ANDRADE ROQUE FALCI, GUILHERME PEREIRA SOUZA, THIAGO CABRAL DE BESSA, TIAGO COSTA FALCI 34

EPIDEMIOLOGICAL PROFILE OF PATIENTS REGISTERED IN THE HIPER-DIA PROGRAM OF A BASIC HEALTH UNIT FROM IPATINGA, MINAS GERAIS, BRAZIL, IN 2012

NAYANDRA SOUZA E SILVA^{1*}, VERONICA MARQUES MATOS¹, FLÁVIO MENDONÇA PINTO³

1. Ungraduated Student of Medicine, IMES; 2. Doctor, Professor of the Medicine Course at the IMES.

* Paraná Street, 120, Ap. 01, Lourdes, Governador Valadares, Minas Gerais, Brazil. CEP: 35030-420 nayassouza@hotmail.com

Received: 05/13/2015; Accepted: 05/27/2015

ABSTRACT

The association between hypertension and diabetes mellitus has been described since the 1970s. Diabetic patients have a prevalence two to three times more hypertension. In 2002 it was created a Reorganization Plan of Attention to SAH and DM, known as Hiper-Dia, with the main objective to globally monitor the patients treated. The purpose of this article is to know the epidemiological profile of patients registered in Hiper-Dia of a health unit in the city of Ipatinga / MG. We evaluated 506 patients, all suffering from hypertension. Of these, 415 are hypertensive and diabetic patients (82%). Patients were predominantly by females (63.2%). The frequency of overweight (38.5%) and obesity (39.7%) was increased among patients. It was also observed an average of 3 drug use among subjects. Among the antihypertensive drugs most commonly used class were diuretics. The prevalence of chronic kidney disease found was high (41.9%). Diabetes mellitus and hypertension are independent risk factors and synergistic effects on cardiovascular disease. We noticed that the evaluated patients do not present a good standard lipid profile and also have a high rate of overweight. The glycemic control assessed by glycohemoglobin reflects deregulation in maintaining euglycemia in diabetic patients.

KEYWORDS: Hiper-Dia program. Diabetes Mellitus, arterial hypertension, chronic kidney disease.

1. INTRODUCTION

Systemic Arterial Hypertension (SAH) is defined as systolic blood pressure greater than or equal to 140 mmHg and / or 90 mmHg for diastolic blood pressure, measured in at least two different situations¹. It is the

most common disease among chronic diseases².

The SAH often associates itself to functional and / or structural changes in target organs such as the heart, brain, blood vessels and kidneys and also the metabolic changes, with consequent increased risk of fatal and non-fatal cardiovascular events (myocardial infarction, stroke and heart failure)^{3,4,5}.

Diabetes Mellitus (DM) comprises a heterogeneous group of metabolic disorders has in common hyperglycemia, which results from defects in insulin action, insulin secretion or both mechanisms. Around 90-95% of cases this way is of type 2 diabetes, which is characterized by defects in action and secretion of insulin⁶. It is an important and growing public health problem with increasing incidence and prevalence worldwide, reaching epidemic proportions⁷.

The diagnosis of DM type 2 is accomplished by measurement of fasting glucose ≥ 126 mg/ dL in two strengths, and/ or blood glucose ≥ 200 mg/ dL after overload with 75 g of dextrose, and/ or random blood glucose ≥ 200 mg/ dL in the presence of clear symptoms of diabetes (unexplained weight loss, polydipsia and polyuria)^{1,6}.

Diabetes Mellitus and Hypertension

The association between hypertension and DM has been described since the 1970s, observed in both sexes and age. Diabetic patients have a prevalence two to three times higher SAH when compared to the general population and around 70% of diabetics are hypertensive^{1,7}.

The prevalence of diabetes and hypertension in Bra-

zila are high and continue to grow and its prevention and monitoring are indicated as top priorities by the Ministry of Health⁸. Both are important causes of heart and kidney disease and even in the case of DM, various types of disability and blindness and amputations⁸.

Thus, treatment of hypertension in diabetic patients is particularly important both for the prevention of cardiovascular disease and to minimize the progression of renal disease and diabetic retinopathy⁶.

The seventh report of the "Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure" (JNC7) recommends that hypertensive patients without diabetes should keep blood pressure levels in values below 140/ 90 mmHg, while that for diabetics that goal lies in values below 130/ 90 mmHg^{6,9}.

In 2002 it created a Reorganization Plan of Attention to SAH and DM, known as Hiper-Dia. This was developed with the main objective to allow the monitoring of treated and patients registered in the outpatient network of the Unified Health System (SUS), generating information for purchasing, dispensing and distribution of medicines, systematically, to these patients¹⁰.

The program aims also by reorganizing the health care work units of the basic network of health services, set goals and guidelines to expand prevention, diagnosis, treatment and control of these diseases^{11,12}.

We note that there are few scientific studies involving the profile of the population registered in Hiper-Dia system, therefore, the aim of our study was to know the profile of patients registered in Hiper-Dia/ Ministry of Health, in a Basic Health Unit (UBS), the Ipatinga, through laboratory and clinical analysis. We seek also to identify the prevalence of chronic kidney disease in hypertensive group and diabetic.

2. MATERIAL AND METHODS

Population and period of study

Have been used the master data of Hiper-Dia patients treated in the year 2012, from a Basic Health Unit (BHU), the Canaan neighborhood in the city of Ipatinga, MG. The universe of patients registered in that year, the UBS Canaan, totaled 2452 adults. Considering this population, for a confidence level of 99%, an 80% detection power and an accuracy of 5%, it estimated a total sample of 523 patients.

Inclusion and exclusion criteria

Were included in the registered individuals in Hiper-Dia research program of the Canaan neighborhood UBS, Ipatinga-MG who held consultations and labora-

tory tests in 2012. We excluded the patients in the registry Hiper-Dia program, had incomplete data regarding measures anthropometric and / or laboratory.

Statistical analysis

Descriptive analyzes were conducted through distribution tables of frequencies and measures of central tendency and variability.

Chronic kidney disease research was carried out through serum creatinine with subsequent calculation of their clearance by the formula of Cockcroft and Gault.

To evaluate possible associations chi-square tests were used Pearson, Student's t or Mann-Whitney. In all analyzes, it was considered a 5% significance level. It used the SPSS statistical software (Statistical Package for Social Science) version 15.0 in carrying out analysis.

3. RESULTS

We evaluated a total of 506 patients registered in Hiper-Dia of a health center in the city of Ipatinga - MG. All 506 participants are hypertensive and 415 are hypertensive and diabetic patients (82%). Most (63.2%) are female and the average age was approximately 63 years. About half of patients (45.8%) are registered in the program over five years (Table 1).

The most frequently used oral hypoglycemic medication (54.2%), followed by simvastatin (46.0%). There was the average use of three drugs, with minimum of 0 and a maximum of 9. The prevalence of overweight in patients analyzed was 38.5% and 39.7% were obese (Table 1).

There was a significant difference between the group of hypertensive patients only and composed of hypertension and diabetes in relation to the use of oral hypoglycemic drugs, simvastatin, AT1 blocker, ACE inhibitor, antiplatelet, NPH insulin and centrally acting hypotensive. All medications except ACE inhibitor were used most frequently by the group of hypertensive and diabetic. Thus, there were also significant differences between the groups regarding the number of medicines used, for hypertensive and diabetic group had higher median medication used (3) that the group only hypertensive (median 2) (Table 1. There is a difference significant among hypertensive and diabetic hypertensive x, p-value <0.05).

Table 2 presented the results described of biochemical data. There were differences means among hypertensive group and diabetic and hypertensive only to glucose, glycohemoglobin and microalbuminuria. For the three variables, the highest rates were observed in the group of hypertensive and diabetic.

Prevalence of Chronic Kidney Disease (CKD) among patients was 41.9%. In hypertensive individuals this figure reached 42.9% and 41.6% hypertensive and diabetic.

Table 1. Profile of the studied population.

	Total	Diabetic and Hypertense		Hypertense		
	n	%	n	%	%	
Gender						
Male	186	36.8	146	35.2	40	44.0
Female	320	63.2	269	64.8	51	56.0
Age						
Mean ± SD	62.8 ± 11.6	62.9±10.7	51±14.9			
Median (Min - Max)	63 (21 – 96)	63 (28-89)	65 (21-96)			
abiding in the program						
< 5 years	274	54.2	222	53.5	52	57.1
> 5 years	232	45.8	193	46.5	39	42.9
Main drugs used						
ORAL ANTIDIABETIC *	274	54.2	261	62.9	13	14.3
SIMVASTATIN *	233	46.0	203	48.9	30	33.0
AT1 BLOCKER *	222	43.9	191	46.0	31	34.1
Ca ⁺² CHANNEL BLOCKER	186	36.8	158	38.1	28	30.8
THIAZIDE DIURETIC	147	29.1	128	30.8	19	20.9
ACE INBIDOR*	145	28.7	105	25.3	40	44.0
ANTIPLATELET*	134	26.5	126	30.4	8	8.8
INSULIN NPH*	102	20.2	94	22.7	8	8.8
BETA BLOCKER	76	15	66	15.9	10	11.0
HANDLE DIURETIC	63	12.5	49	11.8	14	15.4
SAVER K ⁺ DIURETIC	34	6.7	26	6.3	8	8.8
HYPOTENSIVES OF CENTRAL ACTION *	28	5,5	27	6,5	1	1,1
REGULAR INSULIN	24	4.7	21	5.1	3	3.3
FIBRATES	5	1	4	1.0	1	1.1
Number of drugs used*						
Mean ± SD	3.3 ± 1,8	3.5±1,9	2.3 ±1.3			
Median (Min - Max)	3 (0 – 9)	3 (0 - 9)	2 (0 – 6)			
BMI Classification						
LOW WEIGHT	4	0,8	4	1,0		
NORMAL	105	20.8	83	20.0 22 24.2		
OVERWEIGHT	195	38.5	153	36.9 42 46.2		
OBESE	202	39.9	175	42.2 27 29.7		

4. DISCUSSION

From data obtained from DATASUS, in 2012 in the state of Minas Gerais most patients registered in Hiperdia system were suffering only from hypertension (62 796 against 19 437 diabetic and hypertensive). Given this different from that found in our study where we ob-

served a higher prevalence of diabetes and associated hypertension (415 patients with diabetes and hypertension and 91 patients with SAH). However, this finding corroborates with the findings by Borges (2009), since when it evaluates the patients registered in Hiper-Dia program of Dourados (MS) he observed a higher frequency of DM and hypertension (53.48%) on the only carriers of hypertension (44.18%)¹.

Among the patients studied, there was a predominance of females (63.2%), a finding that is consistent with that of other authors^{10,13,14}. This difference found can be attributed to increased demand and use of health services by women¹⁰.

Regarding age, it is estimated that hypertension is present in 65% of seniors in and around 15-20% of the adult population 15. In our study, the profile of patients was similar to that found by Carvalho *et al.* (2012) in which the elderly remains the dominant public. In our patients belonging to the group of hypertensive perceives a higher prevalence of females, a finding quecondiz with the Minas Gerais state data displayed by DATASUS in 2012 and other authors^{16,17}.

The average consumption of medicine found among the patients was 3.3 drugs, this finding is in line with findings by the authors Pereira *et al.*, 2013¹⁸.

According to the Ministry of Health, on the basis of the data Hiper-Dia program in 2012 in the state of Minas Gerais, the main drugs used for DM treatment were oral hypoglycemic agents, followed by insulin. This is in line with those found in our study, in which 62.9% of diabetic patients make use of oral hypoglycemic agents. Bortolini, Junior and Beltrame (2010) also describe a higher prevalence of use of oral hypoglycemic agents for their patients evaluated¹⁹.

The treatment of hypertension in diabetic patients with the use of small doses of thiazide diuretics have been effective in

regard to cardiovascular protection⁶. A reduction in morbidity and mortality found in truly hypertensive patients diuretics⁴. The use of angiotensin II antagonists has shown benefits in terms of renoprotection with its use in type 2 diabetic patients with nefropatia⁶, in this study,

¹ Consultation held on 9,10 and 11 November 2014.
In: <<http://hiperdia.datasus.gov.br/relatorio.asp>>.

46% of patients hypertension and diabetes were using this drug class.

Table 2. Descriptive analysis of biochemical data

		Mean	Median	SD	Min	Max
Hypertensive and Diabetic	Total					
	Total Cholesterol	204.7	200.0	44.3	100.0	374.0
	LDL	116.0	110.0	35.5	27.0	321.0
	HDL	49.7	46.0	13.3	20.0	151.0
	Triglycerides	198.6	179.5	99.4	34.0	901.0
	Glucose*	136.4	117.0	59.1	55.0	382.0
	Glycohemoglobin *	7.2	6.8	2.1	4.0	15.8
	Creatinine	1.2	1.0	0.5	0.5	4.0
	Microalbuminuria *	529.4	29.9	1,068.1	2.4	4,590.0
	Total Cholesterol	205.0	200.0	47.0	89.0	374.0
	LDL	115.9	109.0	37.8	27.0	321.0
	HDL	49.6	47.0	12.5	20.0	151.0
	Triglycerides	198.1	178.0	103.9	21.0	901.0
	Glucose*	145.9	125.0	59.2	55.0	382.0
	Glycohemoglobin*	7.6	7.2	2.1	4.0	15.8
	Creatinine	1.2	1.0	1.2	0.5	22.8
	Microalbuminúria*	597.5	30.0	1,126.2	2.4	4,590.0
Hypertenses	Total Cholesterol	202.0	200.0	31.6	135.0	323.0
	LDL	116.7	112.0	22.5	34.0	190.0
	HDL	50.6	44.0	16.7	30.0	91.0
	Triglycerides	198.4	188.0	78.5	65.0	645.0
	Glucose*	93.3	89.0	34.3	60.0	349.0
	Glycohemoglobin*	5.5	5.0	1.1	4.0	11.3
	Creatinina	1.2	1.1	0.5	0.5	3.0
	Microalbuminúria*	218.7	23.0	669.1	2.6	4,587.0

* There are significant differences between hypertensive and diabetic hypertensive x (p-value <0.05)

Pereira *et al.* (2012) when evaluating patients with hypertension and / or diabetes who have purchased drugs through units of Minas Pharmacy Network notes that in relation to drugs used to treat cardiovascular diseases diuretics (18.7%) were among the most widely prescribed classes of agents followed system acting on the renin-angiotensin-aldosterone system (RAAS) (17%), beta blockers (7.4%) and calcium channel blockers (4.5%)¹⁸.

Among the total patients evaluated in our study the major antihypertensive drugs used were the agents acting on the RAAS (72.65), followed by diuretics (48.3%) and calcium channel blockers (36.85).

According Tomazoni & Siviero (2009) the major

classes of antihypertensive agents used (in descending order) by hypertensive patients were the thiazide diuretic, inhibitors of angiotensin converting enzyme, beta-blockers and calcium channel blockers. However, from our hypertensive patients, the most commonly used classes in order of prevalence include inhibitors of angiotensin converting enzyme, the angiotensin II receptor antagonists, calcium channel blockers and thiazide diuretic lastly²⁰.

The Body Mass Index (BMI) is one of the most widely used methods in the anthropometric assessment of body composition. The association between excess weight, obesity and increased risk of developing hypertension may explain about 20 to 30% of cases of hypertension²¹. The global epidemic of excess weight, is overweight or obese is also described by Garden *et al.* (2007) because of the patients 38.5% were overweight and 39.9% were obese.

Contrary to the findings of Lima *et al.* (2011), which demonstrated a higher prevalence of overweight in the group of hypertensive and diabetic patients, our study found that this group most patients were obese, however, compared to only hypertensive patients these data converge because in both jobs the highest prevalence was overweight patients²².

Chronic kidney disease (CKD) is considered a worldwide public health problem, and in Brazil the incidence and prevalence are increasing^{23,24}. The CKD is defined by lesions of the renal parenchyma (with normal renal function) and/ or the renal functional impairment (FG <60 mL/ min/ 1.73 m²) present for a period less than three months^{23, 24, 25}.

The DM is the most frequent cause of CKD in the world, however, the SAH also appears as a frequent cause²³. Both diseases have increased susceptibility to CKD and are risk group for the disease²⁴.

The prevalence of CKD found in our study was 42.9% in the group of hypertensive patients and 41.6% in the group of hypertensive and diabetic. Santos & Moreira (2012) observed a much lower number than found in our study, about 0.9% of hypertensive alone or hypertensive and diabetic patients had kidney disease²⁶.

All of the antihypertensive classes are effective in controlling blood pressure in patients with CKD, however, has been perceived angiotensin converting enzyme inhibitors and angiotensin receptor blockers are more effective than the other classes, especially in diabetic nephropathy, but also in non-diabetic hypertensive²⁷. An

important aspect to be considered in relation to the early diagnosis and treatment of CKD is that this has a significant share in the increased risk of cardiovascular disease development²⁸.

The recommended values for HDL, LDL, total cholesterol (TC) and triglycerides (TG) by VI Hypertension Guideline, are respectively HDL > 40 mg/ dL, LDL < 100 mg/ dL, CT < 200 mg/ dL and TG < 150 mg/ dL. In the present study, the mean LDL, TC and TG levels were found above their normal values, with which only the HDL average value kept within the desired patterns^{29, 31, 32}.

In a study by Cabral *et al.* (2012) in which the authors evaluated the patients Hiper-Dia group of two health facilities in the municipality of São Luís (MA), they observe a patient profile similar to ours, in which the CT (68.8%) and LDL (83.9%) remained above the expected level and HDL in 77.3% of patients met with values greater than 40 mg/ dL^{29, 31, 31, 32}.

Glycohemoglobin testing (HbA1c) reflects the average blood glucose past the last two to four months and a good glycemic control is considered when their levels are less than 7%⁶. Diabetic patients evaluated for HbA1c showed a poor glycemic control, obtaining an average of 7.6%. Cabral *et al.* (2012) describes that 23.5% of the evaluated patients had a higher HbA1c to 7%^{29, 31, 31, 32}.

5. CONCLUSION

Based on the data analyzed we can draw a more complete profile of our patients. Uncontrolled lipid levels, known as dyslipidemia, especially in diabetic patients raises the patient's cardiovascular risk and consequently the risk of developing myocardial infarction and stroke.

The data on the measurement of glycohemoglobin demonstrated poor glycemic control the diabetic population has shown. As the DM and hypertension independent and synergistic risk factors related to cardiovascular disease, it is necessary to know and follow-up of patients that present and of individuals at risk of developing.

Chronic kidney disease in its early stages is asymptomatic should always be suspected in these patients, once the Diabetes Mellitus is seen as the main cause.

Regular monitoring of these patients ultimately develop the relationship of health professionals and the patient, favoring compliance. Accession this important to reduce the complications of both diseases.

REFERENCES

- [1] Alessi A, *et al.* I Posicionamento Brasileiro em Hipertensão Arterial e Diabetes Mellitus. Arquivos Brasileiros de Cardiologia. 2013; 100(6):491-501.
- [2] Rosário TM, *et al.* Prevalência, Controle e Tratamento da Hipertensão Arterial Sistêmica em Nobres – MT. Arquivos Brasileiros de Cardiologia. 2009; 93(6):672-8.
- [3] Schmidt MI, *et al.* Prevalência de diabetes e hipertensão no Brasil baseada em inquérito de morbidade auto-referida, Brasil, 2006. Revista Saúde Pública. 2009; 43(2):74-82.
- [4] Sociedade Brasileira de Cardiologia; Sociedade Brasileira De Hipertensão; Sociedade Brasileira de Nefrologia. VI Diretrizes Brasileiras de Hipertensão. Arquivos Brasileiros de Cardiologia. 2010; 95(1).
- [5] Belletti DA, Zacker C, Wogen J. Effect of cardiometabolic risk factors on hypertension management: a cross-sectional study among 28 physician practices in the United States. Cardiovascular Diabetology. 2010; 9(7).
- [6] Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes: 2013-2014/Sociedade Brasileira de Diabetes; José Egidio Paulo de Oliveira, Sérgio Vencio – Organização. São Paulo: AC Farmacêutica. 2014.
- [7] Silva, T.R. *et al.* Controle de diabetes mellitus e hipertensão arterial com grupos de intervenção educacional e terapêutica em seguimento ambulatorial de uma unidade básica de saúde. Saúde e Sociedade. 2006; 15(3):180-9.
- [8] Banco Mundial. Documento do Banco Mundial. Brasil: Enfrentando o desafio das doenças não-transmissíveis no Brasil. Relatório Nº 32576BR. 15 de novembro de 2005.
- [9] Cooper-Dehoff RM, *et al.* Tight blood pressure control and cardiovascular outcomes among hypertensive patients with diabetes and coronary artery disease. Journal of the American Medical Association. 2010; 304(1).
- [10] Ferreira CLRA, Ferreira MG. Características epidemiológicas de pacientes diabéticos da rede pública de saúde – análise a partir do sistema HiperDia. Arquivos Brasileiros de Endocrinologia Metabólica. 2009; 53(1).
- [11] Lima AS, Gaia ESM, Ferreira MA. A importância do programa hiperdia em uma unidade de saúde da família do município de serra talhada - PE, para adesão dos hipertensos e diabéticos ao tratamento medicamentoso e dietético. Saúde Coletiva em Debate. 2012; 2(1).
- [12] Brasil. Ministério da Saúde. Hiperdia – Sistema de Cadastro e Acompanhamento de Hipertensos e Diabéticos – Manual de Operação. Rio de Janeiro. 2002.
- [13] Carvalho ALM, *et al.* Adesão ao tratamento medicamentoso em usuários cadastrados no programa Hiperdia no município de teresina (PI). Ciência & Saúde Coletiva. 2012; 17(7):1885-92.
- [14] Dallacosta FM, Dallacosta H, Nunes AD. Perfil de hipertensos cadastrados no programa Hiperdia de uma unidade básica de saúde. Unoesc & Ciência. 2010; 1(1):45-52.
- [15] Paiva DCP, Bersusa AAS, Escuder MM. Avaliação da assistência ao paciente com diabetes e/ou hipertensão pelo Programa Saúde da Família do Município de Francisco Morato, São Paulo, Brasil. Caderno de Saúde Pública. 2006; 22(2):377-85.
- [16] Foletto KC. Perfil epidemiológico, estado nutricional e fatores associados à hipertensão e diabetes mellitus em

idosos cadastrados no Hiperdia no município de caixias do sul (RS). 2009. 46f. Dissertação (Especialista em Saúde Pública) – Universidade Federal do Rio Grande do Sul. Porto Alegre. 2009.

- [17] Gomes TJO, Silva MVR, Santos AA. Controle da pressão arterial em pacientes atendidos pelo programa Hiperdia em uma unidade de saúde da família. *Revista Brasileira de Hipertensão*. 2010; 17(3):132-39.
- [18] Pereira HN, *et al.* Perfil do uso de medicamentos por idosos assistidos pelo programa Hiperdia de campina grande – PB. In:III Congresso Internacional De Envelhecimento Humano. 2013, Campina Grande, PA. Editora Realize. 2013.
- [19] Bortolini ETT, *et al.* Perfil epidemiológico dos diabéticos no município de água doce, SC. *Evidência*. 2010; 10(1-2):131-8.
- [20] Tomazoni T, Siviero J. Consumo de potássio de idosos hipertensos participantes do programa Hiperdia do município de caxias do sul, RS. *Revista Brasileira de Hipertensão*. 2009; 16(4):246-50.
- [21] Barbosa LS, Scala LCN, Ferreira MG. Associação entre marcadores antropométricos de adiposidade corporal e hipertensão arterial na população adulta de cuiabá, mato grosso. *Revista Brasileira de Epidemiologia*. 2009; 12(2):237-47.
- [22] Lima LM, *et al.* Perfil dos usuários do Hiperdia de três unidades básicas de saúde do sul do brasil. *Revista Gaúcha de Enfermagem*. 2011; 32(2):323-9.
- [23] Bastos MG, Bregman R, Kirsztajn GM. Doença renal crônica: frequente e grave, mas também prevenível e tratável. *Revista da Associação Médica Brasileira*. 2010; 56(2):248-53.
- [24] Kirsztajn GM, *et al.* Doença Renal Crônica (Pré-terapia Renal Substitutiva): Diagnóstico. Projeto diretrizes. 2011.
- [25] Bastos MG, Kirsztajn GM. Doença renal crônica: importância do diagnóstico precoce, encaminhamento imediato e abordagem interdisciplinar estruturada para melhora do desfecho em pacientes ainda não submetidos à diálise. *Jornal Brasileiro de Nefrologia*. 2011; 33(1):93-108.
- [26] Santos JC, Moreira TMM. Fatores de risco e complicações em hipertensos/diabéticos de uma regional sanitária do nordeste brasileiro. *Revista da Escola de Enfermagem da USP*. 2012; 46(5):1125-32.
- [27] Bortolotto LA. Hipertensão arterial e insuficiência renal crônica. *Revista Brasileira de Hipertensão*. 2008; 15(3): 152-5.
- [28] Kirsztajn GM, Bastos MG, Andriolo A. Proteinúria e creatinina sérica: testes essenciais para diagnóstico de doença renal crônica. *Jornal Brasileiro de Patologia e Medicina Laboratorial*. 2011; 47(2).
- [29] Cabral NAL, *et al.* Cintura hipertrigliceridêmica e risco cardiometabólico em mulheres hipertensas. *Revista da Associação Médica Brasileira*. 2012; 58(5):568-73.
- [30] Jardim PCBV, *et al.* Hipertensão Arterial e Alguns Fatores de Risco em uma Capital Brasileira. *Arquivos Brasileiros de Cardiologia*. 2007; 88(4):452-7.
- [31] Borges BLC. Comprometimento da função renal em pacientes cadastrados no programa Hiperdia do município de dourados, mato grosso do sul – brasil, 2009. 2009. 74f. Dissertação (Mestrado em Ciências da Saúde) – Universidade de Brasília, Brasília. 2009.
- [32] Pereira VOM, *et al.* Perfil de utilização de medicamentos

por indivíduos com hipertensão arterial e diabetes mellitus em municípios da rede farmácia de Minas. *Caderno de Saúde Pública*. 2012; 28(8):1546-8.



INCIDENCE OF ATRIAL FIBRILLATION IN POSTOPERATIVE CARDIAC SURGERY PATIENTS AT A UNIVERSITY HOSPITAL

RAFAELLA SANTOS MAFALDO¹, VITOR TAVARES PAULA¹, PEDRO VICTOR ALCÂNTARA DA COSTA¹, JULIO CESAR VIEIRA DE SOUSA², ADEMAR ALEXANDRE DE MORAIS³, ROSIANE VIANA ZUZA DINIZ^{4*}

1. Ungraduated Student of Medicine, Federal University of Rio Grande do Norte - UFRN; 2. MD., Cardiologist, Professor of the Medicine Course at the Federal University of Rio Grande do Norte – UFRN; 3. MD., Cardiologist of the Onofre Lopes University Hospital (HUOL); 4. MD., PhD. Cardiologist, Associate Professor of the Medicine Course at the Federal University of Rio Grande do Norte - UFRN;

* Onofre Lopes University Hospital (HUOL). Service Sector – Cardiology Room, 3rd underground. Av. Nilo Peçanha, 620, Petrópolis - Natal, Rio Grande do Norte, Brazil. CEP 59.012-300 rosianevzdiniz@gmail.com

Received: 05/18/2015. Accepted: 05/27/2015

ABSTRACT

Atrial fibrillation (AF) is the most prevalent arrhythmia in medical practice, as well as the most frequent complication after cardiac surgery: incidence of 40%. AF has been implicated in a prolonged hospitalization, hemodynamic instability and increasing death. Considering that, in the State of Rio Grande do Norte, there's no data collection involving post-operative AF (POAF) occurrence in cardiac surgery, an accurate investigation can contribute to prevent its occurrence and reduce its prevalence. The goal of this study is to determine the incidence of POAF after cardiac surgery in patients previously in sinus rhythm. Moreover, it's intended to identify the clinical and laboratory profile of POAF patients, including their evolution within the hospital. A cross-sectional observational retrospective study, involving 223 patients undergoing cardiac surgery at Onofre Lopes University Hospital (HUOL) from the year 2006 to 2010. The average age of the 223 patients was 58.9±14.6 years, predominantly male (61.4%). The POAF incidence was 13.9% (N=31). Coronary Artery Bypass Graft was the most commonly surgery performed (69.95%), followed by aortic valve replacement (8.52%) and mitral valve replacement (6.27%). POAF patients spent longer in intensive care unit (ICU), median of 4 days. On the other hand, non-POAF patients spent the median of 3 days (p=0.034). Mortality in POAF patients was higher (16.13%) comparing with non-POAF group (9.38%) (p=0.001). The incidence of POAF in cardiac surgery of HUOL was lower than that reported in the literature. However, it was associated with increased length of stay in ICU and death in the hospital course.

KEYWORDS: Atrial fibrillation, thoracic surgery, adult, pre-operative care, mortality.

1. INTRODUCTION

Atrial fibrillation (AF) is an arrhythmia characterized by electrical disorganization of the atria leading to their

loss of function. It is the most common arrhythmia in clinical practice and results in the largest number of hospitalizations. Although it can occur originate in normal hearts, atrial fibrillation frequently happens as a consequence of cardiopathies, such as acute myocardial infarction, or as a result of systemic organic disorders, such as hyperthyroidism and pheochromocytoma.

The global incidence of AF is 2%, according to studies by Framingham, but in individuals submitted to cardiac surgery, it increases by up to 40%^{2,3,4,5,6}. Prevalence is higher in men and the elderly, increasing two-fold after the age of fifty years and affecting 10% of octogenarians⁷. Patients with AF are more prone to developing thromboembolic complications, especially stroke and heart failure.

With respect to cardiovascular surgeries, atrial fibrillation is one of the most frequent postoperative complications; however, its determining factors and prophylaxis are still not well defined. It occurs in around 15-50% of patients, and is more common after valve surgery and less frequent after orthotopic cardiac transplantation – 11-24%^{4,7,8,9}. Atrial fibrillation usually emerges between the second and third day postoperative, is self-limited and well tolerated in most patients. However, its occurrence is associated with prolonged hospitalization, hemodynamic instability, increased risk of stroke and a rise in mortality^{5,6,12}.

In this context, in Rio Grande do Norte (RN) state there are no data on the occurrence of AF in postoperative cardiac surgery patients, it is important to conduct a study that collects this information, as well as the profile of patients and their prior history. An accurate investigation of AF in postoperative cardiac surgery patients in

RN may contribute to preventing its occurrence and reducing its prevalence. The long-term results of studies on this issue may decrease hospitalization time, reduce expenses and increase available hospital beds, making the system more functional and posing fewer risks to patients who undergo cardiovascular surgery.

The present study aimed at determining the incidence of AF in postoperative cardiac surgery patients who were in sinus rhythm, identifying the demographic and clinical-laboratory profile of individuals that develop AF and identifying the intrahospital evolution of these patients.

2. MATERIAL AND METHODS

This is a cross-sectional, observational, retrospective study, based on a thorough analysis of the medical records of individuals submitted to cardiac surgery at Onofre Lopes University Hospital (HUOL) between January 2006 and December 2010. Chart data from admission to discharge were recorded in order to standardize information for later analysis. Patients were selected according to the following inclusion criteria: individuals of both sexes; age greater than or equal to 18 years; submitted to heart valve surgery, interatrial/interventricular correction, left ventricular aneurysmectomy, Bentall and De Bono and/or myocardial revascularization with or without extracorporeal circulation; and preoperative sinus rhythm.

A retrospective analysis was conducted of the charts of 223 individuals submitted to cardiac surgery between June 2006 and December 2010, at HUOL, representing 100% of the target population. Exclusion criteria were the absence of chart data confirming cardiac rhythm before heart surgery; presence of atrial fibrillation in the preoperative phase; cardiac surgery to correct aortic pathology; and patients who died during the transoperative phase.

Data analysis was carried out using SPSS 20.0 software. In addition to descriptive analysis, inferential analysis was also performed by the Student's t-test to compare the means of continuous parametric variables between the two groups: the Postoperative Atrial Fibrillation group (POAF) and the Postoperative Sinus Rhythm group (POSR) or the Mann-Whitney for analysis of nonparametric variables.

The study was conducted based on the ethical guidelines contained in resolution 196/96, which governs research involving human beings in Brazil. The project was submitted and approved by the Human Research Ethics Committee of Onofre Lopes University Hospital - (CEP/HUOL), under Protocol no. 570/11 and Certificate of Presentation for Ethical Consideration (CAAE) 0017.1.294.000-11.

The study was entirely financed by the researchers themselves.

3. RESULTS

A total of 276 medical charts of patients submitted to cardiac surgery were analyzed, representing 100% of the target population. Twenty-nine of these were excluded for not meeting the inclusion criteria: 27 with chronic atrial fibrillation, 1 for being younger than 18 years, 1 for intraoperative death and 24 whose charts were not located in the files of the institution, leaving 223 patients in the study sample (Figure 1).

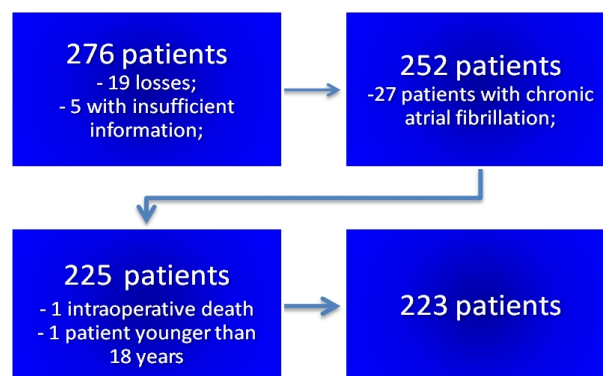


Figure 1. The target population of the study.

3.1 Clinical and demographic characteristics of the population

The 223 patients analyzed had a mean age of 58.9 ± 14.6 , 137 men (61.4%) and 86 women (38.6%). Demographically, the vast majority of this population comes from the interior of Rio Grande do Norte (RN) state (147 individuals = 65.92%), whereas 76 (34.08%) are from the capital (Natal). The schooling level of the sample was low, illiterate individuals and those with incomplete elementary education accounting for 74.2% of the population (N=121) (Table 1).

The prevalent etiology that motivated surgical intervention was coronary artery disease (CAD), which accounted for 76.2% of preoperative diagnoses in this population, followed by valvulopathies (25.6%) and congenital cardiopathies (2.2%).

With respect to comorbidities, 97.3% of the population exhibited some comorbidity, systemic hypertension (SHT) being the most prevalent at 159 (74%), followed by diabetes mellitus (DM), 91 (42.3%), dyslipidemia, 80 (35.8%), and previous acute myocardial infection, 50 (22.32%). It is important to highlight that nearly half of the individuals, 80 (40.5%), exhibited SHT and DM, both a considerable cardiovascular risk factor. Two hundred and nineteen patients were analyzed for prior cardiac surgery, 199 (90.9%) of whom had never been submitted to surgery and 20 (9.1%) who had.

Table 1. Clinical and demographic characteristics of the population studied.

Variable	Results
Ages* (N=223)	58.9 ± 14.6 anos
Gender[†] (N=223)	
Male	137 (61.4%)
Female	86 (38.6%)
Education[†] (N=163)	
Illiterate	44 (27%)
Incomplete primary education	77 (47.2%)
Complete primary education	14 (8.6%)
Incomplete secondary education	5 (3.0%)
Complete secondary education	19 (11.7%)
Incomplete university	0 (0%)
Complete university	4 (2.5%)
Origin[†] (n=223)	
Capital city	76 (34.08%)
Country town	147 (65.92%)
House (n=219)	
House	193 (88.13%)
Another hospital	26 (11.87%)
Height * (m) (N=140)	1.63 ± 0.103
Weight * (Kg) (N=179)	67.97 ± 12.05
BMI * (kg/m ²) (N=139)	29 ± 4.24

* Results expressed as mean ± standard deviation; † Results expressed in number (percentage)

3.2 Atrial fibrillation in the postoperative period (POAF)

The most common surgery performed was myocardial revascularization (MR), accounting for 156 (69.95%) of the surgical procedures, followed by aortic valve replacement, with 19 procedures (8.52%), and mitral valve replacement with 14 (6.27%).

Atrial fibrillation during the postoperative period occurred in 31 of the 223 individuals studied (13.9%), 18 (58.06%) after myocardial revascularization (MRV), 5 following aortic valve replacement (16.12% of POAF patients), 3 (9.68%) after mitral valve replacement, and 2 (6.45%) following MRV associated with left ventricular aneurysmectomy.

Information regarding reversal of arrhythmia was available for 25 patients, 24 of whom reversed their arrhythmia (96%), while only 1 (4%) did not. Reversal of AF was obtained chemically in 23 patients (95.8%), with the use of amiodarone. Only a single patient (4.2%) was electrically cardioverted. Recurrence of arrhythmia

after reversion was observed in 11 patients (45.8%) during hospitalization (Table 2).

Table 2. Data of the Postoperative Atrial Fibrillation (POAF)

Variable	Results
Time until emergence of POAF* (h)	62.38
Hospitalization time * (days)	30.2
Use of Extracorporeal circulation in patients with POAF [†]	21 (67.7%)
Serum K ⁺ level * (mEq/L)	3.5
Reversal of POAF [†] (n=25)	
Nonreverted	1 (4%)
Reversed	24 (96%)
Type of reversal [†] (n=24)	
Drug:	23 (95.8%).
Electric:	1 (4.2%).
Recurrence [†] (n=24)	
Nonrecurrence:	13 (54.2%).
Recurrence:	11 (45.8%).
Incidence of POAF with previous cardiac surgery documented in the chart [†] (n=31)	3 (9.7%)
POAF incidence in patients with previous AF [†] (n=6)	4 (66.67%)

* Results expressed as mean ± standard deviation; † Results expressed in number (percentage)

3.3 Hospitalar patient outcomes

Time in the ICU was greater in the POAF group than in the POSR group, with a median of four and three days, respectively (p=0.034).

Table 3. Length of stay and hospital outcomes of patients undergoing surgery.

Variable	POAF (N=31):	POSR (N=192)	P
Hospital mortality rate [†]	5 (16.13%)	18 (9.38%)	0.001 [§]
Without POAF (N=192)			
With POAF (N=31)			
Length of hospital stay* (days) (N=223)	30.2 ± 23.51 (Median 19)	23.93 ± 17.72 (Median 19)	0.08
Length of postoperative stay in the ICU (days) (N=223)	4	3	0.04

* Results were expressed in Median; † Results expressed as number (percentage); ‡ Mann Whitney Test; § Chi-square Test, T Test.

The POAF group also exhibited longer mean hospital stay, albeit with no statistical difference considering the median of 19 days in both groups. In relation to outcome, 201 (90.13%) patients were discharged, 21 (9.42%) died and 1 (0.49%) was transferred to another hospital.

Hospital mortality in those with POAF compared to the other group was 16.13% and 9.38% ($p=0.001$), respectively (Table 4).

4. DISCUSSION

Regarding to the demographic investigation of the study group, the profile obtained reinforces the representativity of the Onofre Lopes University Hospital (HUOL) for Rio Grande do Norte state, given that 65.92% of individuals were from the interior of the state and the remainder from the capital. Furthermore, this result underscores the need for complex care services in inland areas, showing the urgency of developing strategies to track and prevent cardiovascular disease throughout the state, primary care being of utmost importance in this process. The patients submitted to heart surgery exhibited a low schooling level. A total of 163 patients were analyzed and the sum of illiterates and those with incomplete elementary education was 74.2%. This finding is worrisome since it involved patients who underwent complex surgeries, with late postoperative success highly dependent on treatment adherence, such as the need for anticoagulation in cases of AF².

The incidence of POAF in the present study was 13.9%, less than that described in the literature, estimated at 15-40%. This lower index may be due to MRV, the most widely performed surgery at HUOL, in detriment to those normally associated with POAF, such as valve replacement⁴.

The mean age of 64.97 years in those with POAF is within the risk range for this cardiovascular event, with onset at 55 years⁴ and increasing over subsequent decades, and one of the greatest predictors of POAF^{2,6,11,12,13}. The development of atrial fibrillation and structural cardiac changes attributed to advanced age are responsible for the process⁶.

The length of time until the onset of AF after cardiac surgery is well documented in the literature, showing that 70% of the events occurred in the first four days postoperative¹². This condition was also observed in our study, since the mean time until AF occurrence was 62.38 hours (2.59 days).

With respect to patient evolution, the length of ICU stay in the POAF group was longer than the POSR group, corroborating recent literature data^{4,5}. Furthermore, hospital mortality was 9.42% for cardiac surgery, 16.13% in the POAF group and 9.38% in the POSR group, corroborating recent studies^{4,5,6}, which demonstrate higher mortality in the POAF group, compared to its non-POAF

counterpart (1.7-7.4% and 1.2-4.3% respectively). However, higher mortality was observed in both groups of the present study, which can be attributed to several factors, especially the precarious situation of the Brazilian public health system, as compared to countries in which the other studies were conducted. The high comorbidity index also characterizes the status of the study population as being more severe and is therefore one of the factors that may have contributed to the higher death rate.

5. CONCLUSION

Atrial fibrillation (AF) is frequent in the postoperative phase of cardiac surgery at Onofre Lopes University Hospital, although the incidence is lower than that reported in the literature. Individuals with POAF are predominantly men, with low schooling level and comorbidities. Moreover this population evolves unfavorably, with longer hospital stays and increased in-hospital mortality.

REFERENCES

- [1]. ACCF/AHA/HRS focused update on the management of patients with atrial fibrillation (updating the 2006 guideline): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2011; 123(1):104-23.
- [2]. El-Chami, MF, Kilgo, P, Thourani, V, Lattouf, OM, Delurgio, DB, *et al.* New-Onset Atrial Fibrillation Predicts Long-Term Mortality After Coronary Artery Bypass Graft. *J Am Coll Cardiol* 2010; 55:1370-6.
- [3]. Alqahtani AA. Atrial fibrillation post cardiac surgery trends toward management. *Heart Views* 2010 Jun; 11(2):57-63.
- [4]. Shen J, Lall S, Zheng V, Buckley P, Damiano Jr. RJ, Schuessler RB. The persistent problem of new-onset postoperative atrial fibrillation: A single-institution experience over two decades. *J Thorac Cardiovasc Surg.* 2011; 141(2):559-70.
- [5]. Saxena A, Dinh DT, Smith JA, Shardey GC, Reid CM, Newcomb AE. Usefulness of postoperative atrial fibrillation as an independent predictor for worse early and late outcomes after isolated coronary artery bypass grafting (multi-center australian study of 19,497 patients). *Am J Cardiol.* 2012; 109(2):219-25.
- [6]. Almassi GH, Pecsì SA, Collins JF, Shroyer AL, Zenati MA, Grover FL. Predictors and impact of postoperative atrial fibrillation on patients' outcomes: A report from the randomized on versus off bypass trial. *J Thorac Cardiovasc Surg.* 2012; 143(1):93-102.
- [7]. Kannel WB, Wolf PA, Benjamin, EJ, Levy D. Prevalence, Incidence, Prognosis, and Predisposing Conditions for Atrial Fibrillation: Population-Based Estimates. *Am J Cardiol* 1998; 82:2

- [8]. Pavri, BB, O'Nunain, SS, Newell, JB, *et al.* Prevalence and prognostic significance of atrial arrhythmias after orthotopic cardiac transplantation. *J Am Coll Cardiol* 1995; 25:1673
- [9]. Filardo G, Hamilton C, Hamman B, Hebel RF, Jr., Adams J, Grayburn P. New-onset postoperative atrial fibrillation and long-term survival after aortic valve replacement surgery. *Ann Thorac Surg* 2010; 90(2):474-9.
- [10]. Andrews TC, Reimold SC, Berlin JA, Antman EM. Prevention of supraventricular arrhythmias after coronary artery bypass surgery. A meta-analysis of randomized control trials. *Circulation* 1991; 84:III236-III244.
- [11]. Mathew JP, Fontes ML, Tudor IC, Ramsay J, Duke P, Mazer DC, Barash PG, Hsu PH, Mangano DT. A multicenter risk index for atrial fibrillation after cardiac surgery. *JAMA* 2004; 291:1720-1729
- [12]. Maesen B, Nijs J, Maessen J, Allesie M, Schotten U. Post-operative atrial fibrillation: A maze of mechanisms. *Europace*. 2012; 14(2):159-74.
- [13]. Oliveira *et al.* Postoperative atrial fibrillation following coronary artery bypass graft. *Arq Bras Cardiol* 2007; 89(1):15-19.
- [14]. David Amar MD, Hao Zhang MD, Denis HY, Leung PhD, Nancy Roistacher, M.D., Alan H. Kadish, M.D. Older Age Is the Strongest Predictor of Postoperative Atrial Fibrillation. *Anesthesiology* 2002; 96:352-6
- [15]. Ho, KM, Tan, JA. Benefits and risks of corticosteroid prophylaxis in adult cardiac surgery: a dose-response meta-analysis. *Circulation* 2009; 119:1853.
- [16]. Richard P. Whitlock, Simon Chan, P.J. Devereaux, Jack Sun, Fraser D. Rubens, Kristian Thorlund, and Kevin H.T. Teoh. Clinical benefit of steroid use in patients undergoing cardiopulmonary bypass: a meta-analysis of randomized trials. *European Heart Journal* 2008; 29:2592-2600.
- [17]. Jari Halonen, MD, Pirjo Halonen, PhD, *et al.* Corticosteroids for the Prevention of Atrial Fibrillation After Cardiac Surgery: A Randomized Controlled Trial. *JAMA*. 2007; 297:1562-1567.
- [18]. Patti G, Chello M, Candura D, *et al.* Randomized trial of atorvastatin for reduction of postoperative atrial fibrillation in patients undergoing cardiac surgery: results of the ARMYDA-3 (Atorvastatin for Reduction of Myocardial Dysrhythmia After cardiac surgery) study. *Circulation* 2006; 114:1455.
- [19]. Tamura K, Arai H, Ito F, Someya T, Ushiyama T, Miyagi N. Pravastatin treatment before coronary artery bypass grafting for reduction of postoperative atrial fibrillation. *Gen Thorac Cardiovasc Surg*. 2010; 58(3):120-5.
- [20]. Oliver J. Liakopoulos, Yeong-Hoon Choi, *et al.* Impact of preoperative statin therapy on adverse postoperative outcomes in patients undergoing cardiac surgery: a meta-analysis of over 30 000 patients. *Eur Heart J*. 2008; 29:1548-59.
- [21]. Mirhosseini SJ, Ali-Hassan-Sayegh S, Hadadzadeh M, Naderi N, Mostafavi Pour Manshadi SM. Atrial Fibrillation and Early Clinical Outcomes After Mitral Valve Surgery in Patients with Rheumatic vs. Non-Rheumatic Mitral Stenosis. *Heart Views*. 2012; 13(4): 136-8.
- [22]. Jakubová M, Mitro P, Stanák B, Sabol F, Kolesár A, Cisarík P, Nagy V. The occurrence of postoperative atrial fibrillation according to different surgical settings in cardiac surgery patients. *Interactive Cardiovascular and Thoracic Surgery*. 2012; 15(6).
- [23]. Barucha DB *et al.* Atrial Fibrillation and flutter after cardiac surgery. Uptodate, 2013.



PILATES PRINCIPLES IN LUNG FUNCTION IN PATIENTS IN CARDIAC SURGERY POSTOPERATIVE

ANDRÉ LUIZ CORDEIRO^{1*}, ALEXSANDRA FERREIRA BARBOSA², LARISSA PEREIRA LEITAO², PRISCILA ANDRADE ARAUJO², SARAH CARVALHO³, ANDRÉ RAIMUNDO GUIMARAES⁴

1. Professor at the Faculty Nobre and Physiotherapist of the Nobre Cardiology Institute; 2. Graduated in Physiotherapy by the Faculty Nobre; 3. Coordinator of the Physiotherapy service from the Nobre Cardiology Institute; 4. Doctor, Heart Surgeon of the Nobre Cardiology Institute/ Santa Casa de Misericórdia.

Rua Japão, nº 94, São João, Feira de Santana – Bahia, Brazil. CEP 44052-022 andreisboacordeiro@gmail.com

Received: 25/05/2015; Accepted: 11/06/2015

ABSTRACT

Whereas cardiac surgery can result in pulmonary dysfunction and it becomes necessary indication of respiratory therapy to prevent the development of pulmonary complications. Pilates is considered a method to promote rebalancing of lung function. The objective was to evaluate the applicability of the Pilates principles in Respiratory Muscle Training in patients after cardiac surgery. A prospective, controlled and randomized clinical trial was conducted. The survey was conducted in the Hospitalization Unit of the Nobre Cardiology Institute (IN-CARDIO). The sample comprised 14 patients. Patients were divided randomly into two groups: intervention group and control group. In the intervention group, patients underwent a respiratory muscle training program using the principles of Pilates. In the control group, patients underwent conventional respiratory muscle training unit. Comparing the data from the initial and final evaluations of respiratory muscle strength (MIP e MEP), there was no statistical difference with a $p = 0.45$ and $p = 0.40$, respectively. However, comparing data on initial and final vital capacity (31.2 ± 3.8 and 43.4 ± 12.7), it was observed that the intervention group Pilates showed an improvement on this parameter, with statistical significance ($p < 0.001$). The respiratory muscle training using the Pilates method is ineffective to gain muscle strength, but there was a significant effect on vital capacity, being a viable practice to improve the ventilation in this patient profile.

KEYWORDS: Thoracic Surgery, respiratory function tests, breathing exercises, physical therapy.

1. INTRODUCTION

Cardiac surgery can result in a presentation of pulmonary dysfunction. Muscle training in general aims at an increase in muscle strength, hypertrophy and/ or endurance of the muscle fibers¹. One of the features that be used as proposed in promoting muscle rebalance is Pilates method, which consists of a series of physical exercises, seeking harmony between the body and the mind. Pilates is a physical and mental training, which improves body awareness to work the body as a whole.

This method has gained popularity in recent years, being used for fitness and rehabilitation programs.

The Pilates principles can promote cardiorespiratory fitness. The benefits of the method only depend on the performance of the exercises faithfully to its principles, breathing being the most important principle².

In Pilates, all exercises are associated with breathing. Joseph Pilates emphasized the breath as the primary factor where the inspiration takes place to prepare for the move and the expiration occurs while performing it³⁻⁶. carry out the Pilates method, several muscles are activated, including the muscles involved in breathing, especially the expiratory muscles, which remain contracted during the inspiratory and expiratory phase. As a result this contraction, to perform the inspiration, the (inspiratory muscle main), need to perform a greater contraction force, to perform the lowering of its dome⁷.

The breathing pattern of the method is considered a therapy because it seeks to reduce its pace and increase depth⁸. Unlike other forms of physical training, Pilates does not favor hypertrophy, but the muscle balance, so that the muscle groups interact with strength and flexibility, improved coordination of breathing and intense strengthening the abdominal muscles and other muscles inserted in trunk⁹.

Given the growth of Pilates practice and knowing the benefits of this, in relation to functional performance, including the respiratory system, is necessary to observe the application of the Pilates principles in hospitals. Therefore, this study aimed to develop and evaluate a Muscular Respiratory Training Program using the Pilates principles.

2. MATERIAL AND METHODS

This study was characterized as a prospective, controlled and randomized clinical trial.

The research included 14 volunteer patients, whose selection was intentional, admitted to the Cardiology

Institute Nobre (INCARDIO) from Feira de Santana, Bahia, Brazil, which signed the Consent and Informed (IC), allowing participation in this study, parallel the physiotherapy treatment.

The criteria for inclusion of patients in the study were: individuals of both genders, aged above 18 years and undergoing heart surgery procedure (CABG, aortic and/ or mitral valves replacement, atrial septal defect correction). The study excluded patients with hemodynamic instability, prior heart surgery, or previous history of lung disease symptoms, difficult to understand or perform the measures or physiotherapeutic conducts and refusal to participate in the study.

The patients underwent two evaluations: clinical and respiratory function. In clinical evaluation, we collected anthropometric data and the clinical history. The evaluation of respiratory function, evaluated the lung function by measuring the spirometric variable Forced Vital Capacity (FVC) and respiratory muscle strength with the measures of Maximum inspiratory pressure (MIP) and Maximum Expiratory Pressure (MEP) through the analog mono vacuum meter. These variables were measured at 1st and 5th days at the beginning and after the exercises.

Patients were divided randomly into two groups: Intervention Group and Control Group. The groups were managed according to routine inpatient unit of the Cardiology Institute Nobre. In the Intervention Group, patients underwent a respiratory muscle training program using the principles of Pilates for 5 days a week, two times a day (morning/ afternoon), totaling 10 sessions. In the Control Group, patients underwent routine physical therapy of the institution, without doing extra treatment.

Data analysis was performed by numerical comparisons and statistical inferences. Data collected for analysis were compared with the before and after application of the Pilates principles on lung function, undergoing testing and validating hypotheses with statistical probability.

This study was developed according to Resolution No. 466/12 of CONEP - National Research Ethics Commission approving the guidelines and regulatory standards for research involving human beings, and started after approval by the Ethics Committee of the Faculty Nobre (FAN) from Feira de Santana, Bahia, Brazil.

3. RESULTS

From 18 September to 28 October 2014 were evaluated 23 patients. Of these, 6 were excluded because they had complications during the postoperative period to return to the ICU (Intensive Care Unit), 2 refused to perform the exercises and there was 1 death occurred. The final sample consisted of 14 individuals, divided into two groups. The control group consisted of 7 pa-

tients, 5 men (71.4%) and 2 women (28.6%) with a mean age of 53.1 ± 10.7 years. The intervention group included 7 patients, 4 men (57.1%) and 3 women (42.9%) with mean age of 40.1 ± 18.2 (Table 1).

Table 1. Demographic and anthropometric characteristics of the sample, Feira de Santana, BA, Brazil, (2014).

Feature	Control Group	Group Intervention
Nº. of participants	7	7
Male (n)	5	4
Female (n)	2	3
Age (years), mean \pm SD	53.1 ± 10.7	40.1 ± 18.2

It was announced that among the 14 patients evaluated 8 individuals passed through the surgical procedure from coronary artery bypass graft, totaling 57.1% of the sample, five individuals did mitral valve, totaling 35.7% of the sample and did 1 individual aortic valve, totaling 7.2% of the sample (Table 2).

Table 2. Characteristics of the sample in relation to the type of surgical procedure, Feira de Santana, BA, Brazil, (2014).

Type surgery (n) %	Control Group	Group Intervention
Myocardial revascularization	5 (71.4)	3 (42.9)
Aortic valve replacement	0 (0.0)	1 (14.2)

Regarding the MIP, MEP and Vital Capacity (VC), the control group came from mean values of respectively 31.4 ± 10.6 cmH₂O, 37.1 ± 18.8 and 20.2 ± 4.5 cmH₂O mL/ kg and at the end of the study had an MIP, MEP and CV respectively, 64 ± 19.8 cmH₂O, 54.5 ± 24.5 and 31.2 ± 3.8 cmH₂O mL/ kg. Longer the intervention group at the beginning had a MIP, MEP and CV, respectively, 46.2 ± 14.9 cmH₂O, 35.4 ± 11.1 and 28.1 ± 9.6 cmH₂O. At the end of the study the intervention group had an average of MIP, MEP and CV respectively, 53.4 ± 20.8 cmH₂O, 54 ± 11.9 cmH₂O and 43.4 ± 12.7 mL/ kg (Table 3).

Table 3. Spirometric variables, spirometry and statistical analysis, Feira de Santana, BA, Brazil, (2014).

Variables	Control Group	Group Intervention	p
MIP initial	31.4 ± 10.6	46.2 ± 14.9	0.38
MIP final	64 ± 19.8	53.4 ± 20.8	0.45
MEP initial	37.1 ± 18.8	35.4 ± 11.1	0.90
MEP final	64.5 ± 24.5	54 ± 11.9	0.40
VC initial	20.2 ± 4.5	28.1 ± 9.6	0.34
VC final	31.2 ± 3.8	43.4 ± 12.7	0.001

MIP: Maximum inspiratory pressure; MEP: maximal expiratory pressure; VC: Vital Capacity

Comparing the data from the initial and final evaluations of respiratory muscle strength (MIP and MEP), there was no statistical difference ($p = 0.45$ and $p = 0.40$,

respectively). However, comparing data on initial and final vital capacity (31.2 ± 3.8 and 43.4 ± 12.7), it was observed that the intervention group Pilates showed an improvement on this parameter, with statistical significance ($p < 0.001$).

4. DISCUSSION

Giacomazzi *et al.* (2006)¹⁰ studied 30 subjects aged 53.9 ± 13.93 years (mean \pm SD) of both genders, with 73.3% male, who underwent bypass surgery infarction (50%), valve replacement (49%) and partial valve resection (1%). Similar data were found in our study, where there was a prevalence of males and the most frequent type of surgery was coronary artery bypass grafting.

On the longitudinal and descriptive study in preoperative and postoperative evaluation chips conducted by Gonçalves *et al.* (2012)¹¹ in order to determine the prevalence of types of heart surgery and the relationship with age and gender in the cardiac rehabilitation service in a university hospital from Santa Maria, a male predominance was evident (66.9%) in the surgeries, and in relation to age variable there was no difference between genders.

Brick *et al.* (2004)¹² explain that one of the most frequent heart surgery performed over the past decades is coronary artery bypass grafting, where they can be associated with other cardiac surgery. Advances related to technology and surgical technique has occurred since the completion of the first direct coronary artery bypass grafting.

In the present study, there was an increase in MIP and MEP values in the intervention group, comparing the values obtained at the beginning and end of the training with the Pilates method. However, compared to the values found in the control group, no significant difference. Different results were obtained by Andrade (2010)¹³, where the MIP and the MEP were significantly higher in the intervention group compared to the control group, evaluating women who practice Pilates for at least three months and sedentary women, respectively. Lopes *et al.* (2014)¹⁴, when assessing the effects from Pilates exercises on respiratory muscle strength in older, also found a significant increase in MIP and MEP values after 11 weeks of training.

The profile of the patients in our study differed from previous studies because it is a sample of patients in the postoperative period of cardiac surgery, which are more susceptible to lung disorders and a slower gain of respiratory muscle strength compared to the profile of patients^{13,14}.

In our study, we found the existence of a reduced vital capacity at the first trial and this for Guizilini *et al.* (2004)¹⁵ may be associated with various factors such as the type of surgical incision used anesthetic techniques, postoperative pain and placement of the pleural drain,

and median sternotomy change the compliance of the rib cage.

Ferreira *et al.* (2009)¹⁶ observed the effects of a rehabilitation program of inspiratory muscles in the postoperative period of cardiac surgery, demonstrating increased Forced Vital Capacity (FVC) Maximum Voluntary Ventilation (MVV) and the ratio of forced expiratory volume in the first second (FEV1) and Forced Vital Capacity, pointing similarity between the initial and final measurements of maximal inspiratory and expiratory pressures former. Consistent with our study, the vital capacity values at the beginning and end of the training with Pilates exercises showed a significant increase in the intervention group compared to the control group.

Leguisamo *et al.* (2005)¹⁷ conducted a study evaluating the impact from physical therapy intervention in the preoperative period of cardiac surgery, trying to see if there was influence on postoperative lung capacity, concluded that there is a reduction in lung capacity and respiratory muscle strength regardless of intervention.

In this article, there was no significant increase on the strength of the respiratory muscles, according to the study by Fonsêca¹⁸, which evaluated a group of 33 healthy sedentary elderly, among which 16 held a Mat Pilates exercise program, totaling 24 sessions where there was no significant variation in respiratory muscle strength values.

During training in the intervention group, easy to perform exercises they were requested. However, due to some factors as motivation of the patient, presence of postoperative pain, difficulty of understand the therapist's commands, among others, they suffered interference, which can justify the little significant results in relation to strength of respiratory muscles.

In this study, the control group did not receive a specific inspiratory muscle training, but followed the physiotherapy routine of the institution, performing daily walking exercises, and receive instructions for performing deep breathing exercises in the proportion of 3 sets of 10 reps, daily, without equipment, which may have contributed to improve the MIP and MEP in this group.

There is a shortage of studies in the literature that address the applicability of the Pilates method in hospitals in patients after cardiac surgery. According to Gallagher & Kryzanowska (2000)¹⁹ the method provides an improvement of oxygen in the tissues nutrition, coordination occurs on breathing, which accompanies the exercises, promoting the patient a respiratory rehabilitation and better ventilation and perfusion.

5. CONCLUSION

Based on this study, it was concluded that the application of respiratory muscle training using the Pilates method is ineffective to gain muscle strength in patients

after cardiac surgery. However, there was a significant effect on vital capacity, being a viable practice for improved ventilation in this patient's profile.

To carry out this study, it developed a specific program for training of the respiratory muscles based on Pilates principles. This program should be restructured on new research, with the application of more specific exercises to gain respiratory muscle strength, taking into account the lack of statistical significance of the results.

When comparing the results between conventional group (Control) and group Pilates (Intervention) realize that the respiratory muscle strength, did not obtain a significant difference. This absence of significance may be associated with the test sample used in our study. Thus, it is suggested that further studies be carried out by introducing the Pilates in the hospital, contemplating larger samples, with variation in intervention time.

REFERENCES

- [1] Nunes LO. O efeito do treinamento muscular inspiratório associado ao uso da oxandrolona na função muscular respiratória de indivíduos com doença neuromuscular [tese]. São Paulo: Universidade Federal de São Paulo. 2006.
- [2] Liberalino ES, Sousa TC, Silva VR. Influência dos exercícios do método Pilates sobre o sistema cardiorrespiratório. *Rev Bras de Educ e Saúde*. 2013; 3(3):59-64.
- [3] Rodrigues BG. Método Pilates: uma nova proposta em reabilitação física. Disponível em: <http://www.efisioterapia.net/articulos/metodo-pilates-uma-nova-proposta-em-reabilitacao-fisica>. Acesso em: 26 de Abril de 2014.
- [4] Craig C. Pilates com a bola. 2ª Ed. São Paulo: Phorte. 2005.
- [5] Gallagher SP, Kryzanowska R. O método Pilates de condicionamento físico. 1. ed. São Paulo: The Pilates Studio do Brasil. 2000.
- [6] Pires DC, Sá CK. Pilates: Notas sobre Aspectos Históricos, Princípios, Técnicas e Aplicações. *Rev Digital*. 2005; 10(90):1.
- [7] Facirolli K. Efeitos do Método Pilates sobre Respostas Respiratórias. Outubro, 2010. Disponível em: <http://www.unimep.br/phpg/mostraacademica/anais/8mos tra/5/379.pdf>. Acesso em: 22 de março de 2014.
- [8] Comunello JF. Método Pilates: Aspectos Históricos e Princípios Norteadores. *Instituto Salus*. 2011; 1(1):1-10.
- [9] Panelli C, De Marco A. Método Pilates de Condicionamento do corpo: um programa para toda vida. 2. ed. São Paulo: Phorte. 2009.
- [10] Giacomazzi CM, Lagni VB, Monteiro MB. A dor pós-operatória como contribuinte do prejuízo na função pulmonar em pacientes submetidos à cirurgia cardíaca. *Rev Bras Cir Cardiovasc*. 2006; 21(4):386-92.
- [11] Gonçalves MZ, Real AA, Nascimento JR, *et al.* Análise da prevalência de cirurgia cardíaca no serviço de reabilitação cardíaca do hospital universitário de Santa Maria – Revicardio e sua relação com a idade e gênero. Disponível em: <http://www.unifra.br/eventos/sepe2012/Trabalhos/5351.pdf>. Acesso em: 06 de outubro de 2014.
- [12] Brick AV, *et al.* Diretrizes da cirurgia de revascularização miocárdica valvopatias e doenças da aorta. *Arq. Bras. Cardiol*. 2004; 82(5):1-20.
- [13] Andrade ER. Avaliação da força muscular respiratória de mulheres praticantes do método Pilates. Disponível em: <http://www.unimep.br/phpg/mostraacademica/anais/8mos tra/5/493.pdf>. 2010. Acesso em: 22 Mar. 2014.
- [14] Lopes EDS, Ruas G, Patrizzi LJ. Efeitos de exercícios do método Pilates na força muscular respiratória de idosas: um ensaio clínico. 2014; 17(3):517-23. Disponível em: http://www.scielo.br/scielo.php?pid=S1809-98232014000300517&script=sci_arttext. Acesso em: 31 Out. 2014.
- [15] Guzzilini S, Gomes WJ, Faresin SM, *et al.* Efeitos do local da inserção do dreno pleural na função pulmonar no pós-operatório de cirurgia de revascularização do miocárdio. *Rev Bras Cir Cardiovasc*. 2004; 19(1):47-54.
- [16] Ferreira PEG, Rodrigues AJ, Évora PRB. Efeitos de um programa de reabilitação da musculatura inspiratória no pós-operatório de cirurgia cardíaca. 2009; 92(4):275-82. Disponível em: http://www.scielo.br/scielo.php?pid=S0066-782X2009000400005&script=sci_arttext. Acesso em: 30 Out. 2014.
- [17] Leguisamo CP, Kalil RA, Furlani AP. A efetividade de uma proposta fisioterapêutica pré-operatória para cirurgia de revascularização do miocárdio. *Rev Bras Cir Cardiovasc*. 2005; 20(2):134-41.
- [18] Fonsêca AMC. Influência do método Pilates na força e atividade elétrica dos músculos respiratórios de idosas _ ensaio clínico, controlado, randomizado. 2012. Disponível em: <http://repositorio.ufrn.br:8080/jspui/bitstream/1/9370/1/Al ineMCF DISSERT.pdf>. Acesso em: 31 Out. 2014.
- [19] Gallagher SP, Kryzanowska R. O método Pilates de condicionamento físico. 1. ed. São Paulo: The Pilates Studio do Brasil. 2000.



INCIDENCE OF TUBERCULOSIS IN IPANEMA COUNTY, MINAS GERAIS STATE - 2009 TO 2014

MIRIAN CRISTINA DE OLIVEIRA¹, ARILTON JANUÁRIO BACELAR JÚNIOR^{2*}, ARINIZA ANIELLE FÉLIX OLIVEIRA³, KLEBER CORCETTI DUTRA RITA DE CÁSSIA GOMES³, VALÉRIA GOMES SCHERRE CORCETTI³

1. Professor, Master in Microbiology; 2. Pharmacist-Biochemist and Bachelor of Laws. Specialist in Clinical Analysis, Infectious Parasitic Diseases, Waste Management in Health Care, Education Law and Public Law. Doctoral Student in Law and Social Sciences. MBA in Educational Management. Coordinator of Pharmacy Course of the Faculty Presidente Antonio Carlos Ipatinga-UNIPAC. Member of the CRF-MG Education Commission; 3. Ungraduated Student of Biomedicine, Faculty Única - Ipatinga.

* Faculty Presidente Antônio Carlos, Ipatinga - Marquês de Caravelas Street, 148, Cidade Nobre, Ipatinga, Minas Gerais, Brazil. CEP 35162-148 dr.arilton@gmail.com

Received: 06/01/2015. Accepted: 06/11/2015

ABSTRACT

The objective of this study was to analyze the frequency and clinical features of tuberculosis (TB) in the municipality of Ipanema / Minas Gerais State, Brazil. The research has descriptive and documentary via quantitative analysis of data in the compulsory notification forms of TB patients in the period between 2009 and 2014. Throughout the period studied was observed the occurrence of 42 cases, with a mean incidence of 37.65 /100.000 inhabitants. Most cases occurred in males and aged between 21-40 years. Among the comorbidities associated with TB in the municipality are alcoholism, HIV / AIDS and diabetes. The monitoring through the Directly Observed Treatment (DOT) was performed in 19 cases, but in six of these, there was abandonment. Despite efforts in fighting TB, there is a high rate of incidence of the disease. The city has not yet reached the goal set by the World Health Organization (WHO) for number of cases of the disease, but has already achieved positive results on the target set for the number of deaths.

KEYWORDS: Tuberculosis, epidemiology, incidence, comorbidities.

1. INTRODUCTION

TB is an infectious disease caused by *Mycobacterium tuberculosis*. It presents airborne with chronic evolution and primarily affects the lungs, where it finds favorable environment for its proliferation. A patient with TB can expel about 3.5 million bacilli by droplets during talking, coughing or sneezing. These droplets can remain suspended in the air in areas of poor ventilation and be inhaled by others, forming a network of transmission of the disease^{1,2,3,4}.

The slow multiplication of the bacillus (every 12-20 hours) causes symptoms evolve slowly, which slows down the search for medical care. Often when the diagnosis is made, the sputum smear is positive, the epidemiological cycle is completed, infecting the communicating^{5,6}.

According to WHO, one third of the world population is infected by *Mycobacterium tuberculosis*. The annual number of new cases is about 8.8 million and most are concentrated in 22 countries, including Brazil occupies the 18th place, with about 85,000 cases/ year and approximately 5000 deaths associated^{7,8,9,10,11}.

Some associated factors help to explain the gravity of the situation; among them is cited vulnerability of living conditions, low education, illicit drug use, alcohol use, social inequality, limitations in health services, immunosuppressive diseases, antibiotic resistance, abandonment of treatment, overcrowding, an aging population, lack of medical advice on the consequences resulting from the interruption of treatment and lack of drug use supervision^{3,12,13,14,15,16}.

The behavior and commitment of patients regarding treatment are directly linked to therapeutic success. Alcoholics and drug addicts do not usually make the correct treatment which leads to bacterial resistance to multiple drugs. Social exclusion of patients is also a serious problem, which happens even within families, increasing the chances of death with disease progression^{12,17,18,19,20}.

The aim of this research was to analyze the frequency and clinical features of TB in individuals from Ipanema community/ MG, and evaluate variables related to noncompliance with treatment, given that knowledge of this information can guide the planning of future action in that municipality in with regard to the control of the disease.

2. MATERIAL AND METHODS

The current study is descriptive and documentary, carried out through quantitative analysis of data in the records of compulsory notification of TB patients in the municipality of Ipanema, Minas Gerais, Brazil, in the period between 2009 and 2014.

The research data were collected through a questionnaire developed exclusively for it. They were then used to fill database (Microsoft Excel platform) for further analysis. Later, comparative testing was performed using 2 test (or Fisher's exact test, in indicated cases) for categorical variables using the SPSS 16.0 as editor.

3. RESULTS

Over the period studied there was the occurrence of 42 cases in the city, and calculated a mean incidence of 37.65 per 100,000 inhabitants. Of these, 38 (90.48%) were new cases, 3 (7.14%) were identified as return after default of it ment and only one patient (2.38%) did not have its source identified. The city's population was estimated at 19,318 inhabitants in 2014 (Table 1).

Most patients were male (64.29%) and were aged between 21 and 40 years (57.14%) followed by patients between the ages of 41 and 60 years (28.57%). Table 1 shows the demographic and clinical characteristics of patients with tuberculosis in Ipanema municipality.

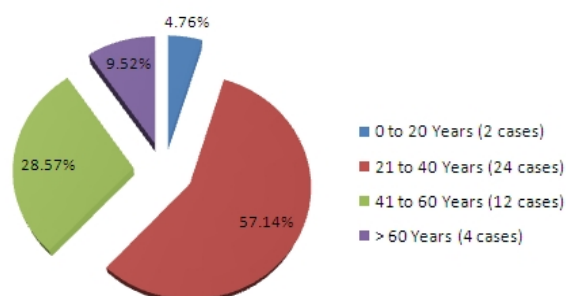


Figure 1. Tuberculosis by age group in the city of Ipanema / MG. **Source:** OLIVEIRA MC, BACELAR JR AJ, OLIVEIRA AAF, Dutra KC, RC GOMES, CORCETTI VGS.

The smear microscopy was performed in all cases; of which 37 (88.10%) positive and 5 (11.9%) negative. Chest radiography was performed in 40 patients, 39 (92.86%) were diagnosed as suspected, 1 (2.38%) were diagnosed normal and radiography was not performed in 2 patients (Table 1).

Various comorbidities are present, the most common: alcohol consumption (23.81%), HIV / AIDS (9.52%) and diabetes (4.76%; Figure 2). Alcohol drinking was the only variable associated with the abandonment of treatment ($p = 0.05$). The TB deaths accounted for 2.38% (1

case) of deaths and there were 3 deaths (7.14%) from other causes. With respect to clinical outcome, there were 28 (66.67%) cases of healing, followed by 8 (19.05%) cases of noncompliance; 3 (7.14%) cases of deaths from other causes; 1 case (2.38%) of death from tuberculosis 1 (2.38%) case of transference. A case has not been evaluated due to failures in reporting forms (Table 1).

Table 1. Tuberculosis incidence - Ipanema / MG.

TUBERCULOSIS INCIDENCE IPANEMA 2009 TO 2014								
	2009	2010	2011	2012	2013	2014	TOTAL	%
CASES	8	9	5	4	9	7	42	100
MENS	3	7	1	4	6	6	27	64.29
WOMANS	5	2	4	0	3	1	15	35.71
NEW CASES	8	9	4	3	8	6	38	90.48
READMISSION NO RECORD ENTRY ⁽¹⁾	0	0	1	0	1	1	3	7.14
SUSPECT RX	7	9	4	4	8	7	39	92.86
NORMAL RX	1	0	0	0	0	0	1	2.38
RX NOT DONE ⁽²⁾	0	0	1	0	1	0	2	4.76
BAAR +	7	9	4	3	7	7	37	88.10
BAAR -	1	0	1	1	2	0	5	11.90
DOT ⁽³⁾	2	1	0	0	9	7	19	45.24
TB DEATH ⁽⁴⁾ OTHER CAUSES DEATH ⁽⁵⁾	0	0	0	0	1	0	1	2.38
ABANDONO	1	1	1	1	3	1	8	19.05
TRANSFERENCE	0	0	0	1	0	0	1	2.38
CURES	6	7	3	2	5	5	28	66.67
INHABITANT	17883	18170	18457	18744	19031	19318		
INC/100,000 ⁽⁶⁾	44.7	49.5	27	21.3	47.2	36.2		
INC/MAN/100,000 ⁽⁷⁾	37.65							

(1) no check in; (2) RX unrealized; (3) directly observed treatment; (4) death tuberculosis; (5) other causes death; (6) incidence / 100,000 inhabitants; (7) Average incidence/ 100,000 inhabitants. **Source:** OLIVEIRA MC, BACELAR JÚNIOR AJ, OLIVEIRA AAF, DUTRA KC, GOMES RC, CORCETTI VGS.

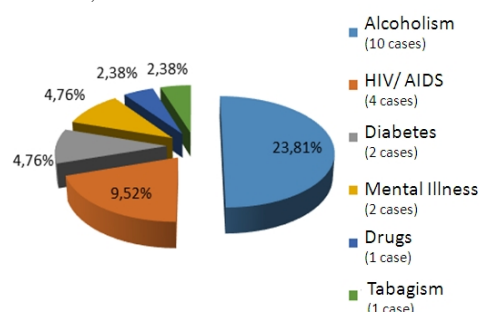


Figure 2. Comorbidities associated with TB in the municipality of Ipanema / MG. **Source:** OLIVEIRA MC, BACELAR JR AJ, OLIVEIRA AAF, Dutra KC, RC GOMES, CORCETTI VGS.

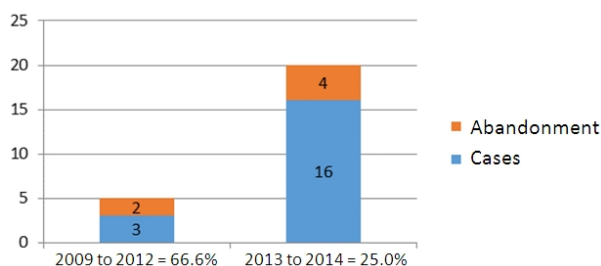


Figure 3. Cases of abandonment of treatment after DOT. **Source:** OLIVEIRA MC, BACELAR JR AJ, OLIVEIRA AAF, Dutra KC, RC GOMES, CORCETTI VGS.

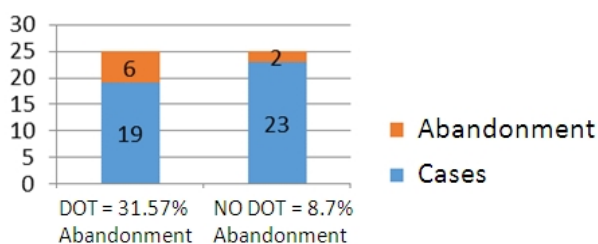


Figure 4. Comparison of treatment dropout after DOT and abandonment of treatment without application of TDO. **Source:** OLIVEIRA MC, BACELAR JR AJ, OLIVEIRA AAF, Dutra KC, RC GOMES, CORCETTI VGS.

4. DISCUSSION

The incidence of tuberculosis in the period studied in the municipality of Ipanema/ MG (37.65/ 100,000) is significantly greater than that observed in the state of Minas Gerais, which was 22.3/ 100,000 population between the years 2002 and 2009⁸ and 17.9/ 100,000 in 2013²¹. This is comparable to the incidence observed in the Santa Catarina State (37/ 100,000)²² and is higher than the national mean of 35.4/ 100,000 inhabitants in 2013. However, can seem low when faced with the high rate of the municipality of Abre Campo/ MG (131.4/ 100,000)²¹. This rate observed in the municipality of Ipanema/ MG, is higher than recommended by the NTCP (National Tuberculosis Control Program) goal millennium development (25.6/ 100,000), to be achieved by the year 2015 (results already achieved by the MG state)⁸.

The difference between the high rates of incidence in the municipality regarding the state probably should be the prioritization in health services, concentrated in metropolitan areas that are signaled by the disease 8 control program demonstrating that this prioritization should be reviewed. Worth remembering that in 2003 the Ministry of Health has increased the budget for the NTCP in 14 times, but in 2011 still watched approximately 70,000 new cases and 4,500 deaths/ year 23,24,25. As noted earlier, tuberculosis in the municipality is predominant in males and in the economically ac-

tive age group.

Among comorbidities present, alcohol consumption is the most frequent, being present in 23.8% of the total, followed by HIV / AIDS and diabetes, getting in line to that found in Minas Gerais. The co-infection rate of HIV/ AIDS (9.52%) in Ipanema/ MG, compared with the results obtained in the state of Santa Catarina in 2009 (26.33%) 26, is relatively low. It notes that alcohol consumption is associated with the abandonment of treatment ($p = 0.05$). Indicating a need for monitoring of patients by multidisciplinary teams to minimize the aggravation of the disease and guide patients, thus preventing abandonments⁸.

The situation of foreclosure cases in Ipanema/ MG, records the tuberculosis deaths (2.38%) within the target set by WHO (less than 5%) by 2015. This goal was achieved by the municipality, as demonstrated in the study, where the rate was only one recorded case, being also below the MG mortality rate, according to the SINAM (National System for Medical care). The cure rate was 66.67% and the percentage of abandonment, 19.05%. Both fell short of targets set by the NTCP in line with the WHO recommends 85% cure and up to 5% of abandonment^{8,25,27,28,29,30}.

The implementation of DOT is stimulated when cure and dropout rates recommended by WHO are not be reached³¹. The abandonment rates after DOT in Ipanema/ MG municipality remain high, even when we applied the DOT in all registered cases, as in the period 2013/2014, which was 25% of abandonment. This result demonstrates the need not only the implementation but also to improve the application of the method, since most cases of abandonment are patients with greater social vulnerability (low education, HIV, without family ties) 8. In the case of the municipality observed there was a higher withdrawal in patients enrolled in the program compared to those who did not have the monitored treatment.

5. CONCLUSION

Despite efforts to combat tuberculosis, there is a high number of incidence of the disease. It is found through study that certain regions are to some indexes within the established or expected goals, but analyzing broadly still fall short of the MS (Ministry of Health) that is 25.6 cases per 100,000 population 2015. the city of Ipanema/ MG has not yet reached the recommended target for number of cases, but has already achieved positive results on the WHO target set for the number of deaths.

The frequency of abandoned and the number of comorbidities are still very high in this population, especially those related to alcoholism, HIV and diabetes. Actions should be implemented to decrease these numbers and consequently the deaths and the incidence.

Projects like the DOT should be reviewed, seeking improvements and verifying that your steps are being executed with correction because it was observed that it is not effective in the city studied, since the group accompanied by the program had a higher dropout rate when compared to unaccompanied group.

REFERENCES

- [1] Ferreira Júnior S. Conhecimento, atitudes e práticas sobre tuberculose e HIV/AIDS em prisões e no serviço público de saúde [Dissertação - Mestrado] [Internet]. Campinas: UNICAMP; 2011. [acesso em 14 out 2014]; Disponível em: <http://www.bibliotecadigital.unicamp.br/document/?view=000788757>
- [2] Medeiros CJ, Pretti CBO, Nicole AG. Características demográficas e clínicas dos casos de tuberculose notificados pelo Núcleo de Epidemiologia Hospitalar no Município de Vitória, Estado do Espírito Santo, Brasil, 2009-2010. Epidemiol. Serv. Saúde [periódicos na Internet]. 2012; 21: 159-66 [acesso em 15 abr 2015]. Disponível em: http://scielo.iec.pa.gov.br/scielo.php?pid=S1679-49742012000100016&script=sci_arttext&tlng=en
- [3] Silva ESF, Barbosa LD. O perfil epidemiológico da tuberculose em Unaí- MG. Rev. FACTU ciência [periódicos na Internet]. 2012; 22:104-24. [acesso em 16 abr 2015]; Disponível em: http://www.clickunai.com.br/clientes/cms/documentos/factu_-_revista_factu_ciencia_22_-_2012_-_setembro_2012.pdf#page=105
- [4] Couto DS, Carvalho RN, Azevedo EB, Moraes MN, Pinheiro PGOD, Faustino EB. Fatores determinantes para o abandono do tratamento da tuberculose: representações dos usuários de um hospital público. Saúde em debate [periódicos na Internet]. 2014; 38:572-81 [acesso em 10 abr 2015]; Disponível em: http://www.scielo.br/scielo.php?pid=S0103-110420140003000572&script=sci_arttext
- [5] Siqueira HR. Enfoque clínico da tuberculose pulmonar. Pulmão [periódicos na Internet]. 2012; 21:15-18 [acesso em 14 set 2014]; Disponível em: http://sopterj.com.br/profissionais/_revista/2012/n_01/04.pdf
- [6] Alcântara CCS, Kritski AL, Ferreira VG, Façanha MC, Pontes RS, Mota RS, et al. Fatores associados à tuberculose pulmonar em pacientes que procuraram serviços de saúde de referência para tuberculose. J. Bras. Pneumologia [periódicos na Internet]. 2012; 38:622-29 [acesso em 21 set 2014]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1806-37132012000500012
- [7] Oliveira MG, Delogo KN, Oliveira HMMG, Netto AR, Kritski MMO. Anemia em pacientes internados com tuberculose pulmonar. J. Bras. Pneumologia [periódicos na Internet]. 2014; 40:403-10 [acesso em 20 set 2014]; Disponível em: http://jornaldepneumologia.com.br/detalhe_artigo.asp?id=2310
- [8] Augusto CJ, Carvalho WS, Gonçalves AD, Ceccato MGB, Miranda SE. Características da tuberculose no estado de Minas Gerais entre 2002 e 2009. J. Bras. Pneumologia [periódicos na Internet]. 2013; 39: 357-364 [acesso em 14 out 2014]; Disponível em: http://www.jornaldepneumologia.com.br/detalhe_artigo.asp?id=2028
- [9] Coêlho DMM, Viana RL, Madeira CA, Ferreira LO, Campelo V. Perfil epidemiológico da tuberculose no município de Teresina-PI, no período de 1999 a 2005. Epidemiol. Serv. Saúde [periódicos na Internet]. 2010; 19: 33-42 [acesso em 2015 abr 10]; Disponível em: http://scielo.iec.pa.gov.br/scielo.php?pid=S1679-49742010000100005&script=sci_arttext
- [10] Campos WR, Campos GS, Miranda SS. Tuberculose intraocular. Rev. Bras. Oftalmologia [periódicos na Internet]. 2011; 70:437-51 [acesso em 16 abr 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-72802011000600021
- [11] Portela MC, Lima SML, Brito C, Ferreira VMB, Escosteguy C, Vasconcellos MTL. Programa de controle da tuberculose e satisfação dos usuários, Rio de Janeiro. Rev. Saúde Pública [periódicos na Internet]. 2014; 48:497-507 [acesso em 18 abr 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-891020140003000497&lng=pt&nrm=iso
- [12] Brás OCR. Vulnerabilidade e tuberculose no Rio de Janeiro. Saúde e Sociedade [periódicos na Internet]. 2014; 23:190-99 [acesso em 23 mar 2015]; Disponível em: <http://dx.doi.org/10.1590/S0104-12902014000100005>
- [13] Piva SGN, Costa MCN, Barreto FR, Pereira SM. Prevalência de deficiência nutricional em pacientes com tuberculose pulmonar. J. Bras. Pneumologia [periódicos na Internet]. 2013; [acesso em 23 set 2014]; 39:476-483. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1806-37132013000400476&lng=pt&nrm=iso&tlng=pt
- [14] Furini AAC, Pedro HSP, Rodrigues JF, Montenegro LML, Machado RLD, Schindler CFHC, et al. Detecção do complexo Mycobacterium tuberculosis por nested polymerase chain reaction em espécimes pulmonares e extrapulmonares. J. Bras. Pneumologia [periódicos na Internet]. 2013; 39:711-18. [acesso em 01 out 2014]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1806-37132013000600711&lng=pt&nrm=iso&tlng=pt
- [15] Loureiro RB, Villa TCS, Netto AR, Peres RL, Braga JU, Zandonade E, et al. Acesso ao diagnóstico da tuberculose em serviços de saúde do município de Vitória, ES, Brasil. Ciência & Saúde Coletiva [periódicos na Internet]. 2013; 19:1233-244 [acesso em 21 set 2014]; Disponível em: http://www.scielo.br/scielo.php?pid=S1413-81232014000401233&script=sci_arttext
- [16] Chirinos NEC, Meirelles BHS. Fatores associados ao abandono do tratamento da tuberculose: uma revisão integrativa. Texto & Contexto - Enfermagem [periódicos na Internet]. 2011; 20:599-606 [acesso em 18 abr 2015]; Disponível em:

- http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072011000300023&lng=pt&nrm=iso
- [17] Macedo LR, Macedo CR, Maciel ELN. Vigilância epidemiológica da tuberculose em presídios do Espírito Santo. Rev. Bras. Promoção da Saúde [periódicos na Internet]. 2013; 216-22 [acesso em 04 dez 2014]; Disponível em: <http://www.redalyc.org/pdf/408/40828920009.pdf>
- [18] Souza SS, Silva DMGV. Passando pela experiência do tratamento para tuberculose. Texto & Contexto - Enfermagem [periódicos na Internet]. 2010; 19:636-43 [acesso em 14 abr 2015]; v. 19: p. 636-643. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072011000400005
- [19] Silva CB, Lafaiete RS, Donato MO. O consumo de álcool durante o tratamento da tuberculose: percepção dos pacientes. Rev. Eletrônica saúde mental álcool e drogas [periódicos na Internet]. 2011; 7: 10-17 [acesso em 18 abr 2015]; Disponível em: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1806-69762011000100003&lng=pt&nrm=iso
- [20] Campani STA, Moreira JS, Tietbohel CN. Fatores preditores para o abandono do tratamento da tuberculose pulmonar preconizado pelo Ministério da Saúde do Brasil na cidade de Porto Alegre (RS). J. Bras. Pneumologia [periódicos na Internet]. 2011; 37:776-782 [acesso em 11 abr 2015]; Disponível em: <http://www.scielo.br/pdf/jbpneu/v37n6/v37n6a11.pdf>
- [21] SES-MG. Coordenação Estadual de Pneumologia Sanitária. Panorama epidemiológico da tuberculose em Minas Gerais. 2014 [acesso em 18 abr 2015]. Disponível em: http://funed.mg.gov.br/wp-content/uploads/2014/06/Apresenta%C3%A7%C3%A3o1_FUNED_EPIDEMIO-TB_2014_Dr-Pedro.pdf
- [22] Traebert J, Ferrer GCN, Nazário NO, Schneider IJC, Silva RM. Tendência temporal da mortalidade por tuberculose no estado de Santa Catarina, Brasil, no período entre 2002 e 2009. J. Bras. Pneumologia [periódicos na Internet]. 2012 [acesso em 10 mar 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_abstract&pid=S1806-7132013000300357&lng=pt&nrm=iso&tlng=pt
- [23] Ministério da Saúde. Tratamento Diretamente Observado (TDO) da Tuberculose na Atenção Básica. Brasília: Ministério da Saúde; 2011 [acesso em 11 mai 2015]. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/tratamento_diretamente_observado_tuberculose.pdf
- [24] Marquievis J, Alves IS, Neves EB, Ulbricht L. Estratégia de Saúde da Família no controle da tuberculose em Curitiba (PR). Ciências saúde coletiva [periódicos na Internet]. 2013; 18: 265-71 [acesso em 21 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232013000100027&lng=en&nrm=iso
- [25] Silva EA, Anjos UU, Nogueira JA. Modelo preditivo ao abandono do tratamento da tuberculose. Saúde debate [periódicos na Internet]. 2014; 38:200-09 [acesso em 22 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-11042014000200200&lng=pt&nrm=iso
- [26] Ferrer GCN, Silva RM, Ferrer KT, Traebert J. A carga de doença por tuberculose no estado de Santa Catarina. J. Bras. Pneumologia [periódicos na Internet]. 2013; 39-61-68 [acesso em 05 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?pid=S1806-371320140001000061&script=sci_arttext&tlng=pt
- [27] Cecilio HPM, Fernandes CAM, Mathias TAF, Marcon SS. Perfil das internações e óbitos hospitalares por tuberculose. Acta Paul. Enfermagem [periódicos na Internet]. 2013; 26:250-55 [acesso em 21 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-21002013000300008
- [28] Furlan MCR, Oliveira SP, Marcon SS. Fatores associados ao abandono do tratamento de tuberculose no estado do Paraná. Acta Paul. Enfermagem [periódicos na Internet]. 2012; 25:108-114.[acesso em 20 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?pid=S0103-2100201200800017&script=sci_arttext&tlng=pt
- [29] Wendling APB, Modena CM, Schall VT. O abandono do tratamento da tuberculose sob a perspectiva dos gerentes de diferentes Centros de Saúde de Belo Horizonte - MG, Brasil. Texto Contexto Enfermagem [periódicos na Internet]. 2012; 21:77-85 [acesso em 21 mai 2015]; Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072012000100009
- [30] Micheletti VCD. Resistência aos fármacos e os resultados evolutivos clínicos - laboratoriais observados em pacientes com tuberculose participantes do inquérito nacional de resistência em porto alegre no período de 2006 – 2007 [Tese - doutorado] [Internet]. Porto Alegre: Universidade Federal do Rio Grande do Sul. Faculdade de Medicina; 2012 [acesso em 22 mai 2015]. Disponível em: <http://www.lume.ufrgs.br/bitstream/handle/10183/89989/000863155.pdf?sequence=1>
- [31] Ministério da Saúde. Manual de Recomendações para o Controle da Tuberculose no Brasil. Brasília: Ministério da Saúde; 2010 [acesso em 02 mai 2015]. Disponível em: http://www.cve.saude.sp.gov.br/htm/TB/mat_tec/manuai/MS11_Manual_Recom.



TERTIARY SYPHILIS AS TRIGGERING FACTOR FOR POSTERIOR UVEITIS: A CASE REPORT

GLEYTON GOMES PORTO^{1*}, ELAINESILVERIO DE OLIVEIRA¹, EGUIMAR ROBERTO MARTINS¹, FÁBIO LAZARI¹, ANA CRISTINA MEDEIROS GURGEL²

1. Ungraduated Student of Medicine, Faculty Uningá; 2. Doctor, Specialist in Infectious Diseases, Professor of Medicine program at the Faculty Ingá.

*Rua Tietê, 604, Ap: 01, Maringá – PR, Brasil. CEP: 87020210 gleytonporto@hotmail.com

Received: 06/10/2015; Accepted: 06/18/2015

ABSTRACT

The syphilis eye disease is rare, affecting 2.5% to 5% of patients with tertiary disease. The eye affections are generally related to immunosuppression. In our case report, a patient (VF, 37, male), presented progressive blindness complaint, burning, itching, algia eye movement and scotoma. Laboratory tests: HIV, nonreactive; VDRL reagent; FTA-ABS IgG positive. The ophthalmologic exam posterior uveitis with cystoid macular edema, optic disc edema and epithelial defect in the mid-periphery. Implemented treatment with benzathine penicillin for three weeks and due to non-adherence, chose crystalline penicillin for 15 days, when he said resolution of symptoms.

KEYWORDS: Syphilis, tertiary syphilis, uveitis.

1. INTRODUCTION

In recent decades, despite improvements in the public health field in Brazil still has a high incidence of sexually transmitted diseases. Place in the world more than 12 million cases per year, of these, 900 000 cases in Brazil¹.

T. pallidum is acquired through direct contact with the wound, either through vaginal intercourse, anal or oral. Pregnant women with syphilis can pass it to the baby, being called congenital syphilis. The other form of transmission is rare, it is by indirect means, blood transfusion².

Thus, the primary syphilis is manifested by adenitis in the range of three to four weeks and disappear without leaving scars. Occurs in the exposed point initially to treponema, often at the ends of the penis, rectum, mouth or tongue. In men it is more common to diagnose it in balanopreputial fold, prepuce, urethral meatus, or rarely intraurethral². In females, injuries can occur inside the

genital tract or the labia minora, however are difficult to diagnosed³.

In the secondary phase is the beginning between four and eight weeks after the primary lesion. General symptoms of secondary phase are: malaise, headache, eye pain, bone pain, arthralgia, meningism, arthritis and hoarseness, rash on the body and face⁴.

While tertiary syphilis are developed lesions with great potential to evolve and affect all organs, including the skin, mucous membranes, bone, cardiovascular and nervous. Syphilis in the nervous system is asymptomatic or symptomatic, with the following forms: meningovascular, acute meningitis, brain or spinal cord gum, neurosyphilis, psychosis, paralysis and atrophy of the optic nerve⁵.

Therefore, the diagnosis is based on clinical, epidemiological and laboratory criteria. The dark field microscopy is the fastest and most effective way for the observation of treponema, procedure with about 70% to 80% of sensibility².

The serological diagnosis is based on non-treponemic or cardiolipínicas and treponemic reactions reactions. The routine test is the VDRL reaction because the property of being capable of titration. To confirm the diagnosis we use a treponemal test as FTA-ABS, which has high sensitivity and specificity, and the first to be positive for the infection. But the involvement of the nervous system is proven in CSF analysis^{6,7,8}.

Therefore, the treatment consists in:

- Primary syphilis: Benzathine penicillin 2.400.000UI (IM), single dose.
- Secondary syphilis: Benzathine penicillin 4.800.000UI (IM) in two weekly doses of 2.400.000UI.
- Tertiary syphilis: Benzathine penicillin 7.200.000UI (IM) in three weekly doses of 2.400.000UI.

In neurosyphilis selected medication is penicillin G,

the dose ranges from 3 to 4,000,000 IU and administered intravenously for four hours that corresponds the total of 18 to 24,000,000 IU daily for 10 to 14 days^{6,7}.

Despite the neurosyphilis be related to the tertiary or late stage of infection, the invasion of the central or peripheral nervous system can occur at any time during the course of the disease syphilitic⁹.

The syphilis who eye disease is rare, affecting about 2.5% to 5% of patients with tertiary disease. Ocular manifestations are diverse, with previous descriptions of focal retinitis, papillitis, iritis, endothelial precipitates, periflebitis, vitreitis and serous retina¹⁰.

These authors described a case of ocular syphilis, with multifocal retinitis and placoid lesions, associated with intense intraocular inflammation. The clinical picture was initially related to some type of immunosuppression, such as HIV or the use of corticosteroids. Recent reports, however, showed that this clinical condition may also affect immunocompetent patients as one of several forms of presentation of ocular syphilis instead of an atypical related immunodepression. Which includes the case in our study addressed.

2. CASE REPORT

VF, 37, male, single, with the complaint vision loss. Refers partial amaurosis progressive starting 4 months ago in the left eye, the lateral field, with episodes of improvement during the day and worse in low light and bright light. After 10 days started the affection of the right eye in a similar evolution.

Reports stinging, itching and character algia predominantly moderate eye movement. Mentions the presence of concomitant scotoma partial blindness, eye when he sought medical assistance was encouraged to make use of steroids and eye drops for two weeks. However, reported worsening symptoms then seeking another specialist, who referred him to a rheumatologist and these together with infectious diseases requested some tests to elucidate a diagnosis.

Laboratory tests were performed presenting: HIV serology, nonreactive; serology for syphilis - positive VDRL (title 1/16); IgG positive FTA-ABS (7.4 IU / ml); blood count, white blood cell count and urinalysis unchanged. Ophthalmologic examination showed the right eye posterior uveitis with cystoid macular edema, optic disc edema and epithelial defect in the mid-periphery leading to diagnosis suggestive of neurosyphilis, then being inferred the diagnosis of posterior uveitis by tertiary syphilis.

To that end, we implemented treatment with benzathine penicillin 7200000UI divided into three doses of 240,000 IU for three weeks. There was improvement of blindness by 40%, however not to have occurred membership effectively, was established new treatment with

crystalline penicillin 4,000,000 IU of 4 in 4 hours for 15 days, when he said resolution of pruritus and pain symptoms, but no significant changes in partial blindness.

3. DISCUSSION

As aforesaid by Santos and ANGELS, 2009, STDs such as syphilis remain high prevalence which was corroborated by the case presented diagnosed with posterior uveitis by tertiary syphilis.

This pathology has as main route of transmission through sexual contact, however, in the case presented was not possible to make a retrospective study to establish the route of transmission, however, not history was mentioned sexual activity with a primary partner, but without the use of condoms.

Because it is a rare disease and to present similar symptoms to various eye diseases and their diagnosis difficult and often is not contemplated the possibility of uveitis by syphilis. After evaluation of three medical professionals of different specialties (rheumatology, infectious disease and ophthalmologist) was elucidated the possibility of tertiary syphilis, and for that, the empirical therapy was performed in order to reduce possible complications.

In the studied literature, as aforesaid, the treatment of tertiary syphilis is: benzathine penicillin as first choice, but when there is no adequate response infers the use of crystalline penicillin. What was duly carried to the patient in question, however, some authors suggest the need to evaluate the cerebrospinal fluid to confirm the diagnosis and therapeutic approach.

4. CONCLUSION

Thus, after appropriate therapy was partial resolution of symptoms presented, corroborating other authors regarding the early diagnosis and treatment aimed at reducing the morbidity and even mortality of affected by syphilis.

REFERENCES

- [1] Santos VC, Anjos KF. Sífilis: uma realidade prevenível. Sua erradicação, um desafio atual. *Revista Saúde e Pesquisa*. 2009; 2(2):257-63.
- [2] Avelleira JCR, Bottino G. Sífilis: diagnóstico, tratamento e controle. *An Bras Dermatol*. 2006; 81(2):111-26.
- [3] Saraceni V. Sífilis, a gravidez e a Sífilis Congênita. *ENSP – FIOCRUZ*. 2005; 03-11.
- [4] Oliveira EVL. *et al.* Sífilis secundária com acometimento pulmonar. *An Brás Dermatol*. 2007; 82(2):163-7.

- [5] Brasil. Sífilis: Estratégias para Diagnóstico no Brasil. Brasília: Ministério da Saúde, Coordenação de Doenças Sexualmente Transmissíveis e Aids. 2010; 01-100.
- [6] Brasil. Diretrizes para controle da sífilis congênita: manual de bolso. 2. ed. Brasília : Ministério da Saúde. 2006; 24;15-27.
- [7] WHO. Guidelines for the management of sexually transmitted infections. 2010; 39-46.
- [8] Sato NS, *et al.* Reatividade do anticorpo IgM anti-*Treponema pallidum* na soroconversão e na resposta sorológica ao tratamento de sífilis. J Bras Patol Med Lab 2012; 48(6): 409-414.
- [9] Barra LAC. *et al.* Neurosífilis apresentação como polirradiculopatia lombar: relato de caso. DST. J Bras Doenças Sex Transm. 2001; 13(4):52-4.
- [10] Zambon F. *et al.* Syphilitic retinitis and panuveitis simulating acute retinal necrosis: case report. Arq Bras Oftalmol. 2010;73(3):288-90.



OPPORTUNISTIC DISEASES RELATION ON PATIENTS SEROPOSITIVE

ARILTON JANUÁRIO BACELAR JÚNIOR¹, EUCILENE GONÇALVES DA SILVA², FLÁVIA LIMA FERREIRA², GERMANA MARIA MEDEIROS DE ASSIS², GIZIELE REIS DE ALMEIDA NUNES²

1. Pharmacist-Biochemist and Bachelor of Laws. Specialist in Clinical Analysis, Infectious Parasitic Diseases, Waste Management in Health Care, Education Law and Public Law. Doctoral Student in Law and Social Sciences. MBA in Educational Management. Coordinator of Pharmacy Course of the Faculty Presidente Antônio Carlos Ipatinga-UNIPAC. Member of the CRF-MG Education Commission; 2. Ungraduated Student of Biomedicine, Faculty Única, Ipatinga.

* Faculty Presidente Antônio Carlos, Ipatinga - Marquês de Caravelas Street, 148, Cidade Nobre, Ipatinga, Minas Gerais, Brazil. CEP 35162-148 dr.arilton@gmail.com

Received: 06/01/2015. Accepted: 06/11/2015

ABSTRACT

The HIV virus nowadays is the subject of guidelines discussed worldwide. Issues related to social values, rights and potential infectious virus because of easy contagion and high social cost guide the main discussions. AIDS is still a disease that generates a lot of prejudice and discrimination, even after years of intense dissemination of information by various media channels, aimed at humanizing the process, for the benefit of HIV carriers and attempt to consolidate basic knowledge of the population. Which were analyzed opportunistic diseases present in patients with reduced immunity due to an increase in viral load of HIV-positive person as well as the means of transmission and treatment after diagnosis. It is felt that most carriers have information about their disease, with regard to the mode of transmission, prevention. However it has been observed that there are patients that do not use of barrier methods or procedures in accordance with the biosafety standards due to discrimination, and bias regulating society since this practice shows them.

KEYWORDS: HIV, AIDS, immune system, opportunistic Infections.

1. INTRODUCTION

The acquired immunodeficiency syndrome (AIDS) has been recognized by mid-year 1981 in the US. The first case of HIV infection in humans has been documented in 1959 in the Democratic Republic of Congo, but was only officially registered in 1981¹. The first cases of HIV positive people in Brazil were confirmed in 1982 in São Paulo².

The HIV is a retrovirus, consisting of RNA and a protein envelope. This virus attacks our body's defense cells, leaving the body more vulnerable to various infections known as opportunistic infections³. These infec-

tions caused by opportunistic pathogens are expected, since the virus causes a great loss of immunocompetence¹. Fungal infections are the first clinical manifestations because of changes that occur in immune function mediated by T lymphocytes⁴.

Some HIV-positive patients may live years without symptoms and without developing the disease, but they can transmit the virus to others. The virus can be acquired through sexual intercourse without prevention, dirty needles or from mother to child during pregnancy and breastfeeding³.

The infection by the HIV is established by two phases: acute and chronic phase⁵. The acute infection is only partially controlled by the adaptive immune response. It is during this phase that occurs incubation of HIV, to emerge the first signs of the disease. This period can range from three to six weeks, the body takes between thirty to sixty days after infection to start producing HIV antibodies.

In the chronic phase of the disease, lymph nodes and the spleen are local replication of HIV continues and tissue destruction. In this period of the disease, the immune system remains active in dealing with most infections with opportunistic microorganism⁶. Opportunistic diseases only appear more severe in patients who already present sufficiently low immunity (immunocompromised).

A main social and health problem is the late self-discovery of the disease, as well as worsen the prognosis of the disease as the infected individual remains long transmitting HIV, will be exhibiting a large number of people at the same time that their treatment may be being postponed².

The infection by the HIV virus is characterized by the appearance of opportunistic diseases such as oral candidiasis, herpes simplex, angular cheilitis among

others⁷.

Thus, were analyzed the opportunistic diseases present in patients with reduced immunity due to an increase in viral load of HIV-positive person as well as the modes of transmission and treatment after diagnosis available.

2. MATERIAL AND METHODS

In order to produce the present study, we conducted a research of keywords in the databases: PubMed, Lilacs and SciELO. The Keywords used were HIV, AIDS, immune system, opportunistic Infections.

We selected the most relevant studies, which correspond to the period 2000 to 2014.

3. LITERATURE REVIEW

History

The acquired immunodeficiency syndrome (AIDS) was recognized in the years 1981, it was once known as a disease of homosexuals, non-contagious, due to the large number of San Francisco and New York homosexuals who had Kaposi's sarcoma. In mid 1987 it was observed Kaposi sarcoma in the elderly and children without any live with gay, reaching the conclusion that it was new disease causing low not yet classified immunity. Between 1987 to 1991 it was discovered that the virus could be transmitted by blood transfer^{1,2}.

Immunity refers to all the mechanisms of our bodies as protection against the strange environment to the body agents. The word "immunity" comes from the Latin "immunis", which means free⁸. The immune response has many aspects that characterize and assist in the distribution of other systems. The main aspect of the immune system is its ability to recognize and respond compounds or foreign organisms. The initial contact invasive, external agent gives rise to a chain events leading to activation of certain lymphocytes cells⁸.

HIV is a retrovirus, classified in the subfamily of lentiviridae that attacks the immune system³. They are enveloped viruses of ribonucleic acid (RNA) positively tape with unique morphology and replication means. Retroviruses are probably the most studied group of viruses in molecular biology⁹.

The lymphocyte displays receptors with unique specificity both B cells and on T cells. It is known that T and B cells have different molecular papers¹⁰. The CD4 + T lymphocytes are the primary targets of this virus. HIV penetrates the CD4 altering the DNA of that cell and releasing multiple copies of the infecting virus. After multiply, breaks the lymphocytes to continue the search for other infectious cycle³.

Opportunistic infections can be a simple flu or more severe infections such as tuberculosis. HIV contains an infectious particle that consists of two identical RNA

packaged tapes with a viral core proteins and surrounded by an envelope of two layers of phospholipids derived from the membrane of the host cell, which is also included in the proteins of the virally encoded membrane⁶.

Nowadays it is clear that is at least two types of HIV, and that HIV-1 and HIV-2, these are related to each other, HIV-2 is endemic in West Africa and also currently spreads in India. However, most cases of seropositive throughout the world is caused by HIV-1, being the most virulent¹.

The infection by HIV, has a course that traversed from the acute phase to the most advanced chronic phase of the disease. In untreated individuals it assesses that the average time between infection and the onset of the disease is around ten years. Nevertheless, since the first cases of HIV positive people found was very evident the serious and progressive as the immune compromised patients infected with HIV⁵.

In the acute phase the disease has the flu features, with plenty of virus note if a marked drop in the levels of circulating CD4 T cells in the peripheral blood. In this stage it is difficult for diagnosis, unless there is a strong suspicion of HIV infection. Virtually all cases the patients to an activation of CD8 T cells kill the cells in which HIV infection and delay the production of antibodies, or seroconversion¹. The critical phase of the disease occurs when the clinical manifestations of infections that are unusual. The diagnosis of any disease associated with HIV can be classified as unusual neoplasms categories, opportunistic infections¹⁰. The immune system begins to be attacked when there is infection by HIV; It occurs in the acute phase of HIV incubation - time between exposure to the virus to emerge the first signs of the disease. This period can range from three to six weeks, the body takes between thirty to sixty days after infection to begin producing antibodies to HIV³.

Viral structures

The term lentiviruses, came from Latin lentus (slow), because this virus persist and continue to replicate for years before causing damage and signs of evidence to the disease. A virus particle contains two identical separate strands of genomic RNA and three enzymes; integrase, protease and reverse transcriptase. HIV has ribonucleic acid (RNA) positively tape that replicate through a DNA intermediate. Viral DNA copy integrates into the host chromosome, becoming a cellular gene⁹. HIV has tropism to dendritic cells and macrophage, since it need cells with low levels of CD4 on their surface. To infect the cell the virus need correceptor glycoprotein GP120 which expresses on its surface. The GP120 causes a change on its amino acid sequence. The infected cells serve as virus reservoir without causing cell death for viral replication¹¹.

Transmission and prophylaxis

The impacted the epidemic provoked challenges to all health professionals the search for improvements and solutions both in the method of prevention, treatment, and the quality of life of HIV-infected individuals (BRAZIL, 2014)¹³. The main forms of HIV transmission are related to contact with blood from infected individuals, usually in vulnerability or risk situations outside of hospital settings. It may occur with use of the same syringe or needle contaminated by more than one person or transfusion with HIV contaminated blood¹⁴.

However, the main form of exposure worldwide is sexual, and the transmission in intercourse without using a condom is considered by the World Health Organization as the most frequent¹⁴.

Vertical transmission occurs from infected mother to child during pregnancy, childbirth or breastfeeding. Intrauterine transmission is possible at any stage of pregnancy. The risk of HIV from mother to-child transmission can be reduced by up to 67% with the use of the drug during pregnancy and at delivery, and drug administration to the newborn for six weeks¹⁴. In these cases is restricted the use of breast milk from mother to child and advised the use of artificial or milk banks³.

Blood transmission associated with injecting drug use is due to the shared use of syringes and needles. This transmission route becomes important due to its world growth³. This transmission by blood transfusion is less relevant in industrialized countries and those that have adopted quality control measures of blood used, as it is in Brazil¹⁵.

Occupational transmission occurs when health professionals are injured with needlestick instruments contaminated with blood from HIV patients¹⁵.

HIV is not transmitted through saliva, tears, hugs, bathing, feeding, vomiting, sweat, feces or urine. HIV does not pass through uninjured skin, as this forms an effective barrier. Treating or caring for someone with HIV is not risky provided you follow the guidelines for prevention¹⁵.

Diagnosis

Since the beginning of the HIV epidemic, the serological diagnosis of infection is carried out with at least two tests, one for sorting and a second, more specific, to confirm screening results¹⁵.

The diagnosis of HIV infection is the detection of specific antibodies to the virus by serological or molecular amplification¹⁶. During the initial phase of primary disease does not detect the presence of anti-HIV antibodies in serum antibodies arise from the 3 - 4 weeks post infection¹⁷. The procedures performed in Brazil, for laboratory confirmatory diagnosis of HIV infection, are registered by the National Health Surveillance Agency (ANVISA) of the Ministry of Health. Among the methods used to record these tests it is important that they

present 100% sensitivity or at least 99.5% specificity for laboratory evaluation, method, those which are conducted by the National Institute of Quality Control in Health, Oswaldo Cruz Foundation (BRAZIL, 2006)³. The procedures performed in Brazil, for laboratory confirmatory diagnosis of HIV infection, are registered by the National Health Surveillance Agency (ANVISA) of the Ministry of Health. Among the methods used to record these tests it is important that they present 100% sensitivity or at least 99.5% specificity for laboratory evaluation, method, those which are conducted by the National Institute of Quality Control in Health, Oswaldo Cruz Foundation³. The tests used to detect anti-HIV antibodies can be separated into: Screening Assays are designed to detect all infected individuals. The tests used to detect anti-HIV antibodies can be separated into: Screening Assays are designed to detect all infected individuals.

The Confirmatory tests are designed to identify individuals who are not infected, but having reactive in the screening test results. Screening tests have a high degree of sensitivity, since confirmatory tests have a high degree of specificity. Tests with high sensitivity capability produce few false-negative results, while with high specificity capacity tests produce fewer false-positive results¹⁴.

The following anti-HIV tests are used:

- ELISA (Enzyme Link Immunosorbent Assays): is a method for detection of anti-HIV antibodies. This is a technique that has been widely used in antibody screening due to its ease of automation, low cost and high sensitivity and specificity.

- Bonding test: are used latex particles coated with HIV antigen when serum anti-HIV antibody positive agglutination reaction is evidenced by this method is simple and inexpensive.

- Polymerase Chain Reaction (PCR) or RNA Qualitative: This reaction is capable of producing millions of copies of DNA from a single copy, the amplification of DNA consists of three basic steps where denaturation occurs the separation of the DNA strands, coupled to hybridization of the primer to join to the synthesis of new DNA strand these steps is one cycle on deference¹⁸.

- Fluorescent antibody technique: it is a serological confirmation test that uses glass slide. The HIV-infected cells are fixed to the blade and then incubated as the patient's serum is added following anti-human immunoglobulin labeled with fluorescein isothiocyanate substance where the positive is identified by fluorescence this method requires more time and skill the ELISA, and fluorescence microscopy¹⁸.

- Western blot: a test is considered the gold standard for confirmation of results reagents in the screening stage of this method is fragmented gel to separate the viral antigen and thus allows the detection of antibodies

to individual proteins of HIV antigen¹⁸.

Treatment

After identification of human immunodeficiency virus Gallo and Montagnier in 1983 and 1984, along with pathophysiology provided the basis for therapeutic trials for HIV. Around 1985 kits have been developed for therapeutic efficacy of the drug compound¹⁷.

In 1987 was created the first drug anti - retroviral specifies that Zidovudine or AZT drug is a viral reverse transcriptase inhibitor, she demonstrated partial efficacy on viral replication. In 1996 a new class studies have shown antiviral protease inhibitors of the enzyme responsible for cleavage poliproteicas tape¹⁹.

Treatment is complex, require medical monitoring to assess the adjustments the body to treatment, side effects and possible difficulties on properly follow medical recommendations. Adhere to treatment for AIDS, it means taking the medicines prescribed by the doctor at the correct times, maintaining good nutrition, exercising, attending the health facility within the prescribed days, and other care¹³.

Antiretroviral drugs suggest in the 1980s to prevent the virus from multiplying in the body. The virus that causes AIDS does not kill HIV but help and avoids the weakening of the immune system, its use is critical to increasing the quality of life and the time of those who have AIDS¹⁷. Thus, the introduction of highly active antiretroviral therapy (HAART) has reduced approximately 33% the number of deaths post-infection with HIV²⁰.

Treatment is continuous, since it still does not know the cure for AIDS. However, accompanied is evaluated according to the uptake of drugs used, its potential, and the pathophysiological conditions of the disease in the carrier²⁰.

The individual infected with HIV suffer symptomatic or asymptomatic changes has a rapid onset or late it is enough to leave the body susceptible to opportunistic diseases that evolve quickly to death. The Antiretroviral Therapy (ART) aims to analyze the factors that interfere with antiretroviral treatment, according to the literature of literature review and guide the patient to the treatment and medication are the best way that we have to improve the quality of life to a carrier.

Opportunistic diseases

- Cytomegalovirus: (CMV) occurs in most patients infected with HIV being transmitted from similar way to HIV. Thus, it will infecting cells in a latent form and reactivating when defect occurs in immunity. HIV-positive patients with this disease are severely immunosuppressed, his CD4 cell count very low normal¹¹. Cytomegalovirus can cause infections in numerous places of that person's body leading to various diseases

such as ulcers, colitis, retinitis and pneumonitis. The retinitis is the most common disease that is caused by cytomegalovirus on HIV-positive patients, occurring retinal damage that if untreated can even lead to blindness⁹.

- Kaposi Sarcoma (Ks) is the neoplasia more present in which are associated with the HIV virus. It is a tumor that may be red or purple, perform single or multiple that will grow quickly, its most frequent location is the palate followed by injury and the oropharynx. It is usually asymptomatic, although sometimes passes the boil and become painful. This neoplasia associated with HIV is considered very aggressive and resistant when treated in every way in HIV positive patients the Kaposi sarcoma lesions will affect the skin can also achieve different internal organs especially the lungs and gastrointestinal tract, will be broadcast on saliva is more common in immunocompromised individual⁹.

- Genital Herpes Simplex: It is a common infection caused by a group of viruses that cause genital grouped vesicular lesions that four to five days will undergo an erosion type and then spontaneous healing in the injured tissue. His injuries are often are quite painful and followed by local erythema. The first manifestation is usually more intense and lengthy that the next that will occur aheadThe recurring profile of infection is random and can occur after a few weeks, months or even years before the crisis. Attacks can be brought about by factors such as emotional stress, sun exposure, fever, low immunity. The patient may even be contaminated by the same virus and have no symptoms and passing it to their partner during intercourse. The incubation period asks vary from one to twenty-six days. The frequency carriers that are in the sleep state can at any time, manifesting the disease. There is still no effective treatment for the healing of the disease. Treatment aims to reduce the manifestations of disease or increase the interval between attacks³.

- Toxoplasmosis gondii: Toxoplasmosis is caused by the protozoan *Toxoplasma gondii*, which may be congenital or acquired⁹. The toxoplasmosis parasite was discovered almost simultaneously by Nicolle and Manceaux, Tunisia, and Splendore, in Brazil, in 1908. The toxoplasma is an intracellular protozoan parasite that can reach many tissues of several mammals and birds. Toxoplasmosis is a universal distribution of disease that infects millions of people worldwide.

The global distribution of the disease is between 20% and 75% of seropositive individuals. In Brazil, this number has been determined in seroprevalence between 50% and 80%⁹. This disease can appear in different ways by the human body. However in serological surveys show that over 80% of primary *T. gondii* infections occur asymptomatic form²¹. *Toxoplasma gondii* has three in-

fective forms in its life cycle: oocyst, bradyzoites contained in cysts and tachyzoites¹⁰. The cats are the definitive hosts, which are related to the production and disposal of oocysts and multiplication of disease, so that only occurs therein will sexual reproduction of parasites. They will ingest the cysts are in tissues of warm-blooded animals, especially rats and birds. After ingestion of cysts they proceed to dispose of them in feces for a period of up to fifteen days and not sporulated oocysts, which probably will be disposed only once throughout life. Environment ideal conditions for temperature, pressure, oxygenation and moisture oocysts take a period of five days to sporulate and become infectious⁸.

The parasite toxoplasmosis can be transmitted to humans through food. People can become infected by eating contaminated meat, not cooked. Accidental ingestion of contaminated raw meat after handling it and not wash their hands thoroughly. Eating contaminated knife or utensils that have been in contact with contaminated raw meat⁹. The woman was infected with toxoplasmosis during pregnancy can transmit the disease to the fetus. People who have received organ transplant can be infected if a donor who is with toxoplasmosis¹⁰.

If the person infected with toxoplasma is being treated for control of immunodeficiency, as in organ transplants, and autoimmune diseases or AIDS, the active forms of the disease can be reactivated from the cysts, causing pneumonia, encephalitis with brain damage and myocarditis, with high mortality. The most severe cases of toxoplasmosis can be brain damage, eye disorders among others. The most severe cases of toxoplasmosis can be brain damage, eye disorders and other⁹.

- Tuberculosis (TB): is an infectious disease causes the bacillus *Mycobacterium tuberculosis* that affect the respiratory system causing discomfort for individual as cough, fever, sweating and chest pain, these are the most common symptoms of TB¹⁷. TB significantly alters the clinical behavior alone; destroys lung alveoli, invading the bloodstream and reaches the lymph nodes and lymph nodes causing an uncontrolled viral load and a decrease in CD4+ lymphocyte count¹⁹.

The Ministry of Health database of Sinan-TB associated with the SINAN-AIDS, we were identified that in Brazil, in 2011 there were 75,441 cases of TB, accounting for 39.21 cases per 100,000 inhabitants. Males predominated in the records with age of the infected between 30-44 years; since the female, owes its highest rate recorded in the age group 15-29 years. In Brazil (2013), have been identified by²¹ about 9,340 cases of people with TB who are HIV positive. Regarding the knowledge of their status as HIV, 65% of TB patients knew about being HIV positive or not.

4. CONCLUSION

Since the discovery of HIV in 1981, AIDS has caused a million deaths worldwide. Its characteristic is destructive to our immune system, its destruction causes a lack in our immune system, causing destruction of CD4 + lymphocytes. The lack of CD4 +, possible appearances of the opportunistic diseases such as viruses, bacteria, fungi and parasites. A large number of individuals infected with HIV is aware only after the demonstrations causes for opportunistic diseases. Given that with the appearance of new diseases with low immunity and that uncontrolled viral load can lead the individual to death.

REFERENCES

- [1]. Murphy K, Travers P, Walport M. *Imunobiologia*. 7.ed. Porto Alegre: Artmed. 2010.
- [2]. Pinto ACS, *et al.* Compreensão da pandemia da aids nos últimos 25 anos. *DST – Jornal Brasileiro de Doenças Sexualmente Transmissíveis*. Fortaleza. 2007; 19(1): 45-50. Disponível em: <http://www.dst.uff.br/revista19-1-2007/7.pdf>. Acesso em: 18 set. 2014.
- [3]. Brasil. Ministério da Saúde. HIV/AIDS, hepatites e outras DST. Brasília: Ministério da Saúde, 2006; 196 p. (Cadernos de Atenção Básica, n. 18) (Série A. Normas e Manuais Técnicos)
- [4]. Cavassani VGS, *et al.* Candidíase oral como marcador de prognóstico em pacientes portadores do HIV. *Rev. Bras. Otorrinolaringol.* São Paulo. 2002; 68(5):630-4. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-72992002000500005. Acesso em: 20 ago. 2014.
- [5]. Christo PP. Alterações cognitivas na infecção pelo HIV e Aids. *Rev. Assoc. Med. Bras.* São Paulo. 2010; 56(2):242-7. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S010442302010000200027&lng=en&nrm=iso. Acesso em: 05 out. 2014.
- [6]. Abbas AK, Lichtman AH, Pillai S. *Imunologia celular e molecular*. 6.ed. São Paulo: Elsevier. 2008.
- [7]. Tornelli SQ, *et al.* Manifestações bucais em pacientes pediátricos infectados pelo hiv: uma revisão sistemática da literatura. *Rev. da Faculdade de Odontologia – UPF*. [S.l.]. 2013; 18(13). Disponível em: <http://www.upf.br/seer/index.php/rfo/article/view/3584>. Acesso em: 20 set. 2014.
- [9]. Benjamini RC, Sunshine G. *Imunologia*. 4.ed. Rio de Janeiro: Guanabara Koogan. 2002.
- [10]. Patrick MR, *et al.* *Microbiologia Médica*. 6.ed. Rio de Janeiro: Elsevier, 2009.
- [11]. Coico R, *et al.* *Imunologia*. 6.ed. Rio de Janeiro: Guanabara Koogan. 2010.
- [12]. Charles AJ, *et al.* *Imunologia*. 5 ed. Rio de Janeiro: Artmed, 2002.
- [13]. BRASIL. Ministério da saúde. Diagnóstico sorológico da infecção pelo HIV. Comentários sobre a portaria nº 488/98, 1998 do ministério da saúde. (folheto). Disponível em:

- http://bvsmms.saude.gov.br/bvs/publicacoes/20diagnostico_sorologico.pdf. Acesso em: 06 out. 2014.
- [14]. Wersom ESS, *et al.* Manual técnico para o diagnóstico da infecção pelo HIV. Brasília: Ministério da Saúde, 2013. Disponível em: http://bvsmms.saude.gov.br/bvs/publicacoes/manual_tecnico_o_diagnostico_infeccao_hiv.pdf
- [15]. Machado, Daisy Maria. Recomendações para a atenção integral a adolescentes e jovens vivendo com HIV/AIDS, 2013. Disponível em: http://bvsmms.saude.gov.br/bvs/publicacoes/recomendacoes_atencao_integral_hiv.pdf Acesso em: 05 nov. 2014.
- [16]. Boletim Epidemiológico. Secretaria da vigilância em saúde. Departamento de DST, Aids e hepatites Virais. Ano III. 2014; 01. Disponível em: <http://www.aids.gov.br/publicacao/2014/boletim-epidemiologico-2014>.
- [17]. Rodrigues JC. Dinâmica das doenças infecciosas e parasitárias. Rio de Janeiro [S.l.]: Editora Guanabara, 2005.
- [18]. Murray PR, *et al.* Microbiologia médica. Rio de Janeiro: Editora Elsevier, 2004.
- [19]. Souza M. Assistência de Enfermagem em Infectologia. São Paulo: Editora Atheneu. 2006.
- [20]. Salomão, Reinaldo, Campos AC. Guia de Medicina Ambulatorial e Hospitalar de Infectologia. Barueri (SP): Editora Eletrônica. 2004.
- [21]. Martins M. Qualidade de vida e adesão ao tratamento anti-retroviral de pacientes portadores de HIV. 2010. Disponível em: http://www.scielo.br/scielo.php?pid=S0034-89102010000400019&script=sci_arttext&tlng=es. Acesso em: 03 out. 2014.
- [22]. Milhomem E. Estudo de carga de doença: impacto da coinfeção tuberculose e vírus da imunodeficiência humana no Brasil, no ano de 2011. 2014. Disponível em: http://bdm.unb.br/handle/10483/10287?mode=full&submit_simple=Mostrar+produto+em+formato+completo. Acesso em:
- [23]. Silva E, Gatti LL. Toxoplasmose em paciente infectados pelo hiv. [S.l.]: [s.n], 2010. Disponível em: http://www.fio.edu.br/cic/anais/2010_ix_cic/pdf/05ENF/16ENF.pdf. Acesso em: 04 set. 2014.



PRIMARY HYPOLACTASIA - LITERATURE REVIEW

BRUNA CAROLINE PESSOA ANDRADE^{1*}, ANA BEATRIZ GUEDES ALI¹, DANIELA ANDRADE ROQUE FALCI¹, GUILHERME PEREIRA SOUZA¹, THIAGO CABRAL DE BESSA¹, TIAGO COSTA FALCI²

1. Ungraduated Student of Medicine, IMES; 2. Graduated in Medicine, IMES, Specialist in Family and Community Medicine at UFMG.

IMES (FAMEVAÇO) –Av. Marechal Cândido Rondon 850, Ipatinga Minas Gerais, Brasil. CEP: 35164-314, brunapessoa@hotmail.com.

Recebido em 25/05/2015. Aceito para publicação em 11/06/2015

ABSTRACT

Lactose is a disaccharide present in mammalian milk and its digestion is carried out by enzyme lactase-phlorizin hydrolase (lactase). This enzyme is present in the villi of the small intestine and has the function of hydrolyzing the lactose molecule into two monosaccharides, glucose and galactose. Lactose intolerance is due to a dysfunction which occurs at level of the small intestine caused by the absence of lactase. It is defined as a clinical syndrome characterized by the presence of one or more symptoms such as abdominal pain, nausea, flatulence, abdominal distension and diarrhea that occurs after ingestion of lactose or lactose-containing products.

KEYWORDS: Lactose Intolerance, primary hypolactasia, malabsorption.

1. INTRODUÇÃO

Lactose is a disaccharide present in milk of mammals and humans in its digestion is carried by lactase-phlorizin hydrolase, more commonly known as lactase. Lactase is present in the villi of the small intestine and has the function of hydrolyzing the lactose molecule into two monosaccharides, glucose and galactose so that these can be absorbed by intestinal cells^{1,2,3,4}.

The concentration of lactase enzyme distributed throughout the intestine varies, being a 40% lower activity in the duodenum as compared to the jejunum. The lactose malabsorption does not necessarily lead to intolerance symptoms of lactose and only with the onset of abdominal symptoms of lactose malabsorption that can characterize an individual as having lactose intolerance⁵.

Lactose intolerance is due to a dysfunction which occurs at the level of the small intestine caused by the absence of lactase. From the etiology of enzyme defect, lactase deficiency may be classified as a congenital, primary or secondary disorder^{4,6}.

The congenital origin of intolerance is a rare disease

that occurs due to deficiency of the lactase jejunal babies, since lactose intolerance secondary source can be triggered by an intestinal injury, such as celiac disease, Crohn's disease and malnutrition^{2,3,6}.

The primary source of intolerance is characterized by being permanent, and can cause premature in a congenital deficiency of lactase, while in adults can cause a deficiency of lactase^{6,7}. The main difference between the congenital lactose intolerance and the primary adult hypolactasia is the molecular level, which, in the first there is an absence of lactase enzyme is or is truncated, whereas in the second, the enzyme lactase is normal, however there a reduction in their expression throughout life⁵.

The primary hypolactasia is the most common type of lactose intolerance, in which there is a reduction, genetically programmed, the concentration of lactase from two to three years of age, and that intolerance symptoms resulting from this become more evident teeth in adolescence or adulthood^{3,8,9}.

2. MATERIAL AND METHODS

It is an article of literature review. Journals were selected in the main databases, as Scielo, PubMed and Lilacs. The keywords used for research include "Hi-primary polactasia", "lactose intolerance" and "primary hypolactasia Diagnostics". Then the most relevant articles were used as a basis for writing this article.

3. LITERATURE REVIEW

The undigested lactose when it becomes a source of substrate for the microorganisms of the colon, being fermented and converted to lactic acid, methane and hydrogen gas. The gas produced generates abdominal bloating and flatulence. Lactic acid, in turn, is an osmotically active compound such that draws water into the

intestinal lumen, resulting in diarrhea^{3,7}.

Still occurs the production of volatile fatty acids which lead to acidification of stool, producing a pH below 5.5². The gases are still suffering intestinal absorption and are subsequently eliminated by breathing, promoting an important diagnostic source⁵.

Thus, lactose intolerance is defined as a clinical syndrome characterized by the presence of one or more symptoms such as abdominal pain, nausea, flatulence, abdominal distension and diarrhea that occurs after ingestion of lactose or lactose containing products^{3,4,9}.

Abdominal pain is usually located in periumbilical region or lower quadrant. The stools are typically bulky, frothy and watery. Importantly, that even patients with chronic diarrhea, weight loss is not often this finding⁵.

It is believed that lactose intolerance is also associated with systemic symptoms such as headache and dizziness, muscle and joint aches, fatigue, mouth ulcers, cardiac arrhythmias, pollakiuria, and others^{5,10}.

Symptoms resulting from the ingestion of lactose vary with the individual, and depend on the amount of ingested lactose, the degree of deficiency of the lactase enzyme and the type of food with which the lactose has been consumed^{3,4}.

For the diagnostic evaluation, we can cite methods that assess the absorption of lactose, as the intolerance test lactose, hydrogen breath test and exhaled carbon dioxide and genetic testing⁴.

Lactose intolerance constitutes intake test 25 to 50 grams lactose individual with the subsequent evaluation of their glycemic index. Fasting glucose is compared with the blood glucose curve after ingesting lactose, so that patients who absorb lactose obtains an increase of 1.4 mmol / L (25 mg / dL) or higher in glucose^{5,7,11}.

The hydrogen breath test measures the expired concentration of hydrogen in the breath sample after ingestion of lactose. It is based on the idea of producing hydrogen from the fermentation in the colon of carbohydrates that are not absorbed. The test is considered positive when there is an increase of 20 ppm (parts per million) compared to baseline^{5,11}. This is considered the gold standard for the diagnosis of lactose intolerance⁵.

Genetic testing is performed by collecting the patient's blood sample, with subsequent analysis of their DNA for the presence of polymorphisms in the LCT gene (gene of human lactase)¹.

Special care must be taken with the treatment of patients lactose intolerant, because the total and definitive exclusion power lactase can cause injury to the individual's nutrition with respect to calcium, phosphorus, and vitamins, may trigger a reduction in density bone mineral and consequently lead to fractures⁵.

4. CONCLUSION

Early diagnosis and proper management of patients with lactose intolerance can lead to improvements in their quality of life.

There are several diagnostic options present in our midst and that used reliably translate into excellent tools to reach a definitive diagnosis.

REFERENCES

- [1] Wortmann, AC, Simon D, Silveira TR. Análise molecular da hipolactasia primária do tipo adulto: uma nova visão do diagnóstico de um problema antigo e frequente. *Revista da AMRIGS*. 2013; 57(4):335-43.
- [2] Gasparin FSR, Teles JM, Araújo SC. Alergia à proteína do leite de vaca versus intolerância à lactose: as diferenças e semelhanças. *Revista Saúde e Pesquisa*. 2010; 3(1):107-11.
- [3] Costa L, Rocha SC. Intolerância à lactose: conduta nutricional no cuidado de crianças na primeira infância. 2012. 12f. Dissertação (Mestrado em Nutrição clínica) - Universidade Regional do Noroeste do Estado do Rio Grande do Sul, Ijuí.
- [4] Santos FFP, *et al.* Intolerância à lactose e as consequências no metabolismo do cálcio. *Revista Interfaces: Saúde, Humanas e Tecnologia*. 2014; 2.
- [5] Mattar R, Mazo DFC. Intolerância à lactose: mudança de paradigmas com a biologia molecular. *Rev da Ass Méd Bras*. 2010; 56(2):230-6.
- [6] Sá PTM, Delani TCO, Ferreira AA. Aspectos etiológicos da hipolactasia. *Rev UNINGÁ Review*. 2014; 20(2):123-8.
- [7] Abath TN. Substitutos de leite animal para intolerantes à lactose. 2013. 34 f. Monografia (Bacharelado em Nutrição) - Universidade de Brasília, Brasília, 2013.
- [8] Bem JF, *et al.* Comparação entre métodos de diagnósticos tradicionais com o teste genético para detecção de intolerância a lactose. *Saúde em Foco*. 2013; 6:87-92.
- [9] Martins EL. Hipolactasia tipo adulto em crianças com polimorfismo c/t-13910: avaliação da ingestão nutricional e marcadores do metabolismo ósseo. 2012. 27f. Dissertação (Mestrado em Nutrição) - Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto, Porto.
- [10] Matthews SB, Campbell AK. Lactose intolerance and neuromuscular symptoms. *The Lancet*. 2000; 356(9228):511.
- [11] Ponte PRL. Avaliação do teste químico no diagnóstico de intolerância à lactose e sua associação com polimorfismo genético em uma população de fortaleza/CE. 2012. 123f. Dissertação (Mestrado em Farmacologia) - Universidade Federal do Ceará, Fortaleza.

