

## HODGKIN LYMPHOMA PROFILE OF WOMEN FROM THE NORTH OF THE STATE OF MINAS GERAIS, BRAZIL

*Perfil do linfoma de Hodgkin em mulheres do norte de Minas Gerais*

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**Abstract: Objective:** This work aims to analyze the epidemiological and socio-demographic profile of the Hodgkin lymphoma (HL) in women from the north of the state of Minas Gerais, Brazil between 2008 and 2016. **Methodology:** a quantitative, transverse and descriptive epidemiological study, developed through the analysis of the database of the Hospital Information System from the Brazilian Unified Health System (Sistema Unificado de Saúde, SUS), during the period described. The variables considered were age, race, number of hospitalizations, type of hospital, type of admission, and hospital facility, as well as expenses and death rates. **Results:** We recorded 115 hospital admissions due to HL, 112 (97.4%) in the private sector and 106 (92.2%) in an emergency department. The total expenses in both cases were R\$ 95,620.49. Prevalence was higher in the age range between 20-39 years (32.1%) and brown color (80.3%). In addition, five deaths were recorded (4.35% of the hospital admissions), and in two of them (40%), patients were between 40 and 49 years old. **Conclusion:** The disease is more prevalent in brown women, in the age group of 20 to 29 years, demanding greater attendance and spending in the private sector. The mortality rate was higher in patients over 40 years of age. Thus, health professionals should provide patients with Hodgkin lymphoma adequate quality care for their recovery and cure. It is worth emphasizing the need for projects that contribute to the construction of important links between those who need assistance and the ones able to provide it in order to reduce morbidity and mortality caused by this disease.

**Keywords:** Hodgkin Lymphoma; Women; Morbidity and mortality rates.

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**Resumo: Objetivo:** analisar os perfis epidemiológico e sócio-demográfico do linfoma de Hodgkin em mulheres do norte de Minas Gerais, entre os anos de 2008 a 2016. **Metodologia:** estudo epidemiológico, quantitativo, transversal e descritivo, desenvolvido mediante análise da base de dados do Sistema de Informações Hospitalares do Sistema Único de Saúde, durante o período descrito. As variáveis consideradas foram faixa etária, raça, número de internações, tipo de hospitais, tipo de internação e estabelecimento de atendimento, além de gastos e óbitos. **Resultados:** Constatou-se 115 internações decorrentes do LH, sendo 112 (97,4%) no regime privado e 106 (92,2%) em caráter de urgência. Somando-se as despesas em ambos os regimes, chega-se ao valor de R\$ 95.620,49 gastos. A prevalência mostrou-se superior na faixa etária entre 20-39 anos (32,1%) e na cor/raça parda (80,3%). Ademais, cinco óbitos foram atestados (4,35% das internações), sendo que, em dois deles (40%), as pacientes possuíam entre 40 e 49 anos. **Conclusão:** A doença é mais prevalente em mulheres pardas, na faixa etária dos 20 aos 29 anos, demandando maiores atendimentos e gastos no setor privado. A taxa de mortalidade foi maior em pacientes acima dos 40 anos. Assim, faz-se necessário que os profissionais de saúde forneçam às portadoras de linfoma de Hodgkin, assistência com a devida qualidade, para a sua recuperação e cura. É válido ressaltar a necessidade de projetos que contribuam para a construção de importantes elos entre aquele que necessita de assistência e o que pode fornecê-la, a fim de reduzir a morbimortalidade pela doença.

**Palavras-chave:** Linfoma de Hodgkin; Mulheres; Morbimortalidade.

## INTRODUCTION

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Lymphomas are defined as a group of diseases that result from the accumulation of malign lymphocytes in the lymphatic ganglia. These tumor cells might also disseminate by the lymphatic route, reaching the bloodstream or, more rarely, organs not formed by lymphoid tissue. This type of neoplasia might be divided in Non-Hodgkin Lymphoma (NHL) and Hodgkin Lymphoma (HL), the latter being a solid lymphoproliferative disorder of neoplastic B-cells from the germinal center (GC) or post-GC. This denomination is a tribute to the English physician Thomas Hodgkin that, in 1832, was the first to describe a primary lymphatic malignancy.<sup>1,2</sup>

This pathology is characterized by two main histological types: the Nodular Lymphocyte-Predominant HL (NLPHL) and the Classical HL (CHL). In the former, the typical tumor cells are PL (Lymphocyte-Predominant cells), while in the latter they are collectively denominated as Hodgkin and Reed-Sternberg (HRS) cells. The CHL, by its turn, is subdivided in: Nodular Sclerosis presents lymphocyte-rich, mixed cellularity, and lymphocytic depletion. In the West, 95% of the cases correspond to CHL and 60%-70% of them belong to the Nodular Sclerosis subtype.<sup>1,3</sup>

Generally, the Hodgkin Disease, as it might also be called, is a rare disease, with an incidence of about three cases per 100 thousand people annually, representing 30% of all the lymphomas in the West, and 1% of all neoplasia. Despite being found mainly among young people and adults within 25-30 years, the HL might occur in any age range, with a new peak of incidence after the 55 years, thus exhibiting a bimodal curve. In 2016, for example, data from Cancer National Institute (*Instituto Nacional do*

*Câncer*, INCA) estimated 2,470 new cases, 40.9% of them in women.<sup>1,3,4</sup>

The disease starts at the moment a lymphocyte, normally a B-type, becomes a malignant cell, multiplying and spreading in an uncontrolled way, resulting in identical copies. Hence, fever episodes, night sweats, weight loss, itching, and asthenia might be common, although unspecific. Furthermore, it should be highlighted that, besides a family history of lymphoma, immunosuppression, and autoimmune disorders, infectious diseases (such as Epstein-Barr virus), solid organ transplant or stem cell transplants, radiation exposure, and contact with herbicides, are important risk factors. The diagnostic of Hodgkin Lymphoma is essentially histological and is based in the biopsy of a lymph node with typical HRS cells, along with an inflammatory stroma. This finding might also be detected in other organs associated to a compatible clinical context.<sup>1,2,4,5</sup>

In Brazil, although the advancement of the HL has been progressive, making this neoplasia a relevant topic in the public health system, few investigations addressing this issue have been published, hindering the knowledge of the academic community about this disease. In this way, the present investigation is of considerable importance, since it analyses the data of hospital admissions of women with Hodgkin Lymphoma in the north of the state of Minas Gerais, as well as their social demographic profile, between 2008 and 2016, clarifying the presentation of this disease in this macroregion.<sup>5</sup>

## METHODOLOGY

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This is a quantitative, transverse and descriptive epidemiological study, based on

secondary data about health information from 2008 to 2016, collected from the Departamento de Informática do Sistema Único de Saúde (DATASUS), a part of the Sistema de Informações Hospitalares (SIH/SUS), on the site (<http://www.datasus.gov.br>), accessed in March/April, 2017. Its main source is the Consent Form of Hospital Admission (Formulário de Autorização de Internação Hospitalar (AIH)). The study area was the north of the state of Minas Gerais macroregion, with 1,735,670 inhabitants. Women with Hodgkin lymphoma are the target population of this investigation. The selection of the sample was made through the Informações de Saúde (TABNET) platform, and epidemiological indicators and hospital morbidity selected with the option: General, by place of hospitalization – from 2008. The variables of this study were: gender (female), race (white, black, brown, yellow, Native American), age groups (01 to 75 years), type of admission (elective or emergency), type of administration (public or private), hospital facility, deaths, death rates, and expenses according to the type of admission. The data management and analysis were performed using the software Excel (Office 2016) and the software Statistical Package

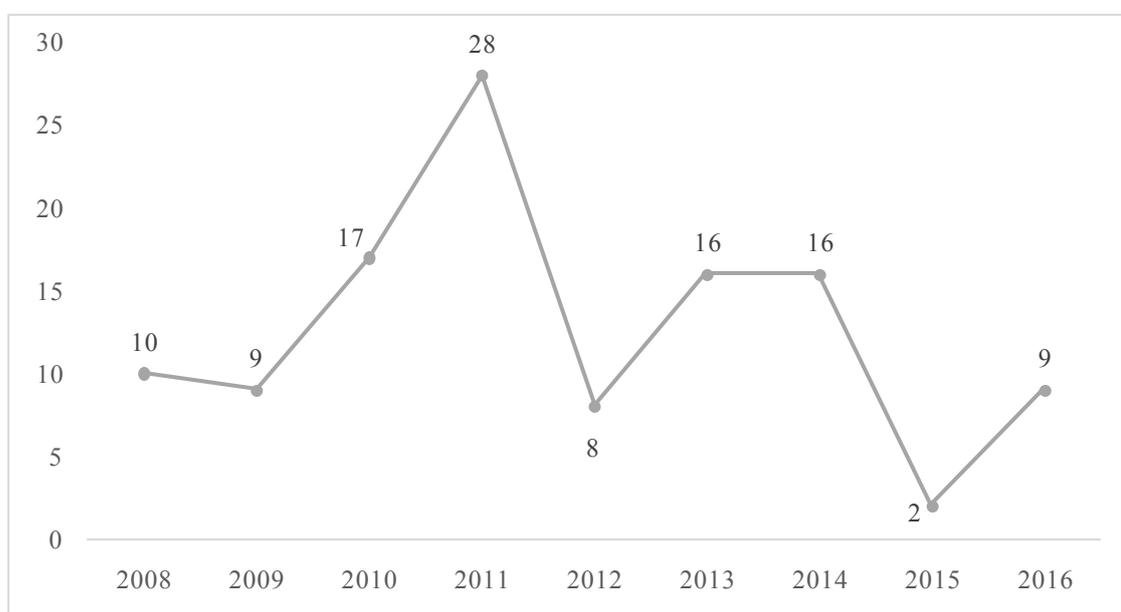
for the Social Sciences (SPSS) for Windows, version 15.0 and Origin 7.1. Since the source of information for this investigation is a public database there was no need to submit this project to a Research Ethics Committee.

## RESULTS

Based on the SIH/SUS data, between 2008 and 2016, 115 female patients with Hodgkin lymphoma were hospitalized in the north of the state of Minas Gerais, with an average of 12.77 cases annually.

From 2009 to 2011, there was a remarkable increase in this number, making 2011 the year with the highest value: 28 hospital admissions (24.3%). However, a sharp decrease marked the year 2012, which presented only eight cases. In 2013, the numbers raised to 16 (13.9%), remaining stable until 2014. Differently, in the next year, only two admissions were recorded for this disease (a reduction of 87.5% compared to the previous year) and, in 2016, nine women were hospitalized (Figure 1).

**Figure 1 - Number of hospital admissions of women with Hodgkin Lymphoma in the north of the state of Minas Gerais, Brazil, between 2008 and 2016.**



The age of the patients varied from 1 to 75 years and the 20-29 age group presented the highest incidence, amounting 37 cases (32.17%), followed by the 15-19 age group, with 22 women (19.13%). The brown color/race was expressively more affected, with 93 patients (80.9%), as shown in Table 1.

**Table 1 – Socio-demographic data about the prevalence of Hodgkin Lymphoma in women in the north of the state of Minas Gerais, Brazil, between 2008 and 2016**

Variables (N)	N°	Percentage
<b>Age Groups</b>		
1 to 4 years	3	2.61%
5 to 9 years	5	4.35%
10 to 14 years	11	9.57%
15 to 19 years	22	19.13%
20 to 29 years	37	32.17%
30 to 39 years	14	12.17%
40 to 49 years	12	10.43%
50 to 59 years	9	7.83%
60 to 69 years	1	0.87%
70 to 75 years	1	0.87%
<b>Color/race</b>		
White	10	8.7%
Black	4	3.5%
Brown	93	80.9%
No Information	8	6.9%

HSC-MOC: Hospital Santa Casa Montes Claros / HAT: Hospital Aroldo Tourinho

HDG: Hospital Dilson Godinho / HUCF: Hospital Universitário Clemente Faria

According to Table 2, from the 115 admissions, nine (7.8%) were elective admissions, being all of them in the private sector. The others (92.2%) were emergency admissions, and among them, 103 (97.2%) took place in the private sector, with the highest demand for the Hospital Dilson Godinho, that received 57 cases (49.56%). Therefore, only three women (2.6%) were attended by the public sector, represented by the Hospital Universitário Clemente de Faria (HUCF). It is important to mention that from the five patients attended at the HUCF, two (40%) were treated in the private sector.

**Table 2 – Distribution of the cases of Hodgkin Lymphoma according to the type of hospitals, type of admission, and hospital facilities in the north of the state of Minas Gerais, Brazil, between 2008 and 2016**

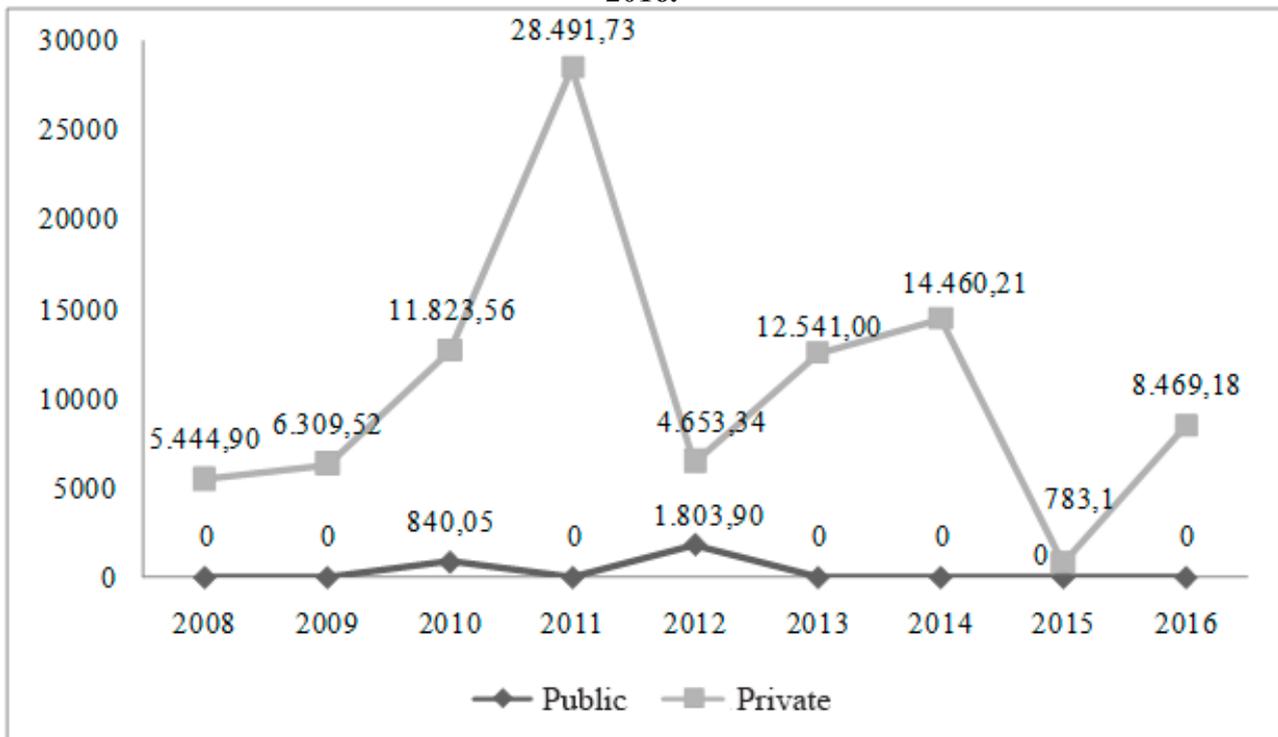
<b>Type of hospital</b>		
Public	3	2.6%
Private	112	97.4%
<b>Type of admission</b>		
Elective	9	7.8%
Emergency	106	92.2%
<b>Hospital facility</b>		
HSC-MOC	52	45.22%
HAT	1	0.87%
HDG	57	49.56%
HUCF	5	4.35%

HSC-MOC: Hospital Santa Casa Montes Claros / HAT: Hospital Aroldo Tourinho

HDG: Hospital Dilson Godinho / HUCF: Hospital Universitário Clemente Faria

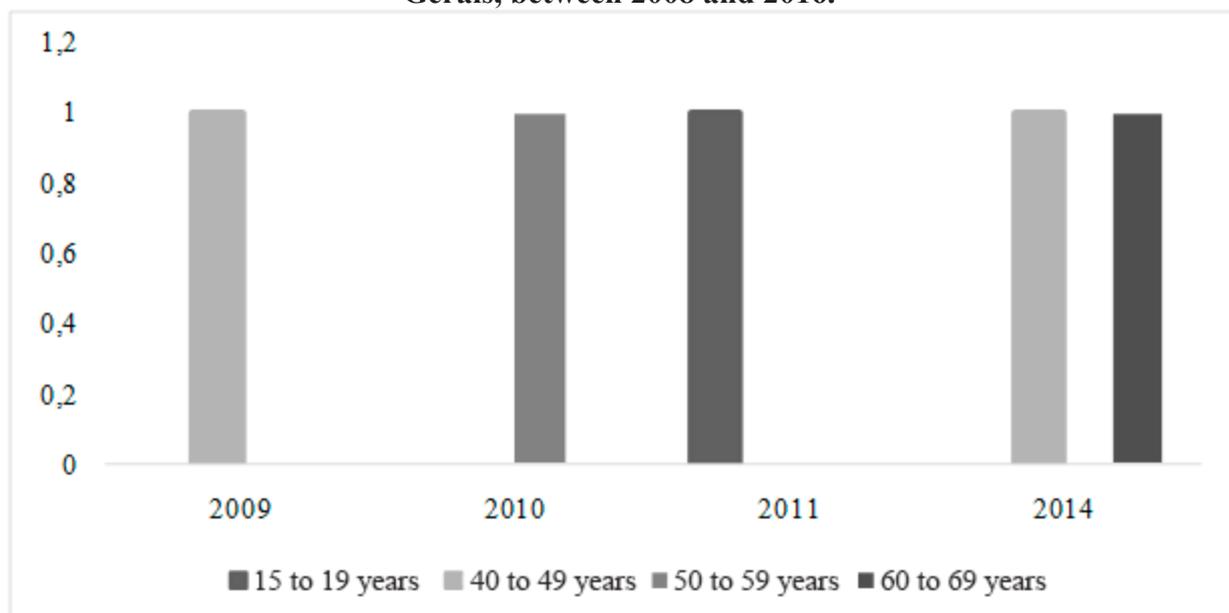
The expenditures with admissions due to HL were expressively higher in the private sector (97.2%) compared to the public hospitals (2.8%), amounting R\$ 95,620.49. The highest values in private hospitals were recorded in 2011 (30.6%), while the lowest amounts were found in 2015 (0.8%). The public hospitals bore costs only in 2010 and 2012, with R\$ 840.05 e R\$ 1,803.90, respectively (Figure 2).

**Figure 2 - Expenditures of the Private and Public sectors with hospital admissions of women with Hodgkin Lymphoma in the north of the state of Minas Gerais, Brazil, between 2008 and 2016.**



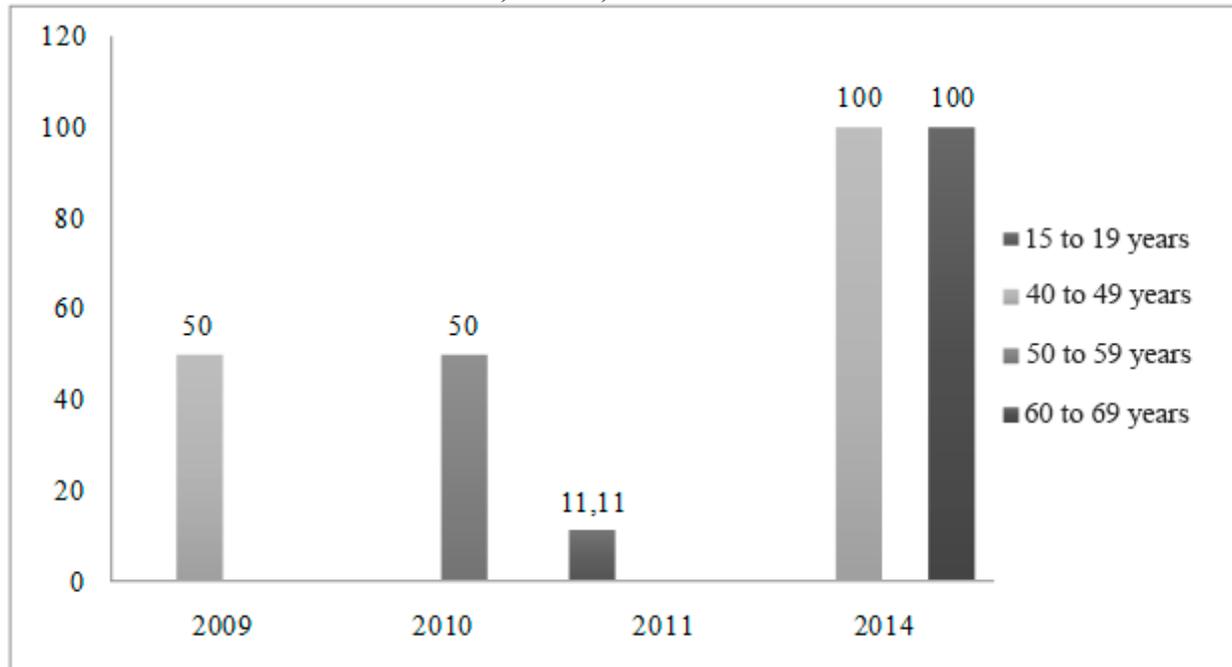
From 2009 to 2014, five deaths were recorded due to HL (which represents 4.35% of the admissions), two of them (40%) being patients with 40 to 49 years. The other age groups presented only one death (20%) in different years, which represents 0.87% of the hospitalizations (Figure 3).

**Figure 3 - Death rates by age group in women with HL in the north of the state of Minas Gerais, between 2008 and 2016.**



However, the mortality rate remained constant (50) from 2009 to 2010, for each age group. Further, the year 2014 recorded the period with the highest mortality rate for the age groups 40 to 49 and 60 to 69 years (Figure 4).

**Figure 4: Mortality rate by age group in women with HL in the north of the state of Minas Gerais, Brazil, between 2008 and 2016.**



## DISCUSSION

According to SIH/SUS, in the period considered in this study, the highest incidences of HL in the state of Minas Gerais occurred in the age group of 20 to 29 years and in brown women, representing 23.5% and 41.7% of the cases, respectively. These values are similar to those recorded in this investigation for the north of the state of Minas Gerais. In contrast, the death rate predominated among women with 50 to 59 years (21.9%), especially in the Belo Horizonte area, the capital of Minas Gerais.<sup>6</sup>

Comparing the information herein reported to the data from all the southeastern region of Brazil, the one with the highest number of HL in women, the results also showed a highest incidence in

patients with 20 to 29 years (23%, approximately), although with the white women being more affected (42%). It should be observed also, that, in general, all the Brazilian regions presented a higher number of deaths from the age of 50 on, predominantly above 80 (approximately 28%).<sup>6</sup>

Based on this information and considering the fact that the INCA has estimated 2,470 new records of HL for 2016, with 41% of them being women, the north of the state of Minas Gerais presents a low incidence of this pathology.<sup>4</sup>

During the years 1990 to 2005, 68 children and teenagers with HL were addressed in a study with the DH-II-90 protocol, made up of chemotherapy and radiotherapy combined and adapted to the risk group. Among these, 20 subjects (29.4%) were females, with 6 to 10 years (38.2%) as the most affected age group. In contrast, the least

affected age group was the one from 16 to 21 years, differently from the present investigation, in which this group was the second most prevalent.<sup>7</sup>

The investigation conducted by Lopes, Moreira, and Soares<sup>3</sup>, based on the review of the patient records with HL, recorded in the Center of Oncological Studies and Investigations (*Centro de Estudos e Pesquisas Oncológicas de Minas Gerais*, CEOMG), hospitalized during the period of September 1973 to December 2009, concluded that from the 115 cases analyzed, 52.4% to 42.9% had between 20 and 60 years, and between 0 to 19 years, respectively. These data were similar to those presented in this study. However, the aforementioned research has indicated the white subjects to be more affected (67.6%), differently from what was revealed in this work.<sup>3</sup>

In an investigation conducted in Belém and in the surrounding cities, based on the records of 65 patients, males and females with confirmed histopathological diagnose of HL, in the period of 1996 to 2005, the most affected age group in females was 20 years, differently from the present study, that showed an average age of 27.3 years.<sup>5</sup>

By means of a statistical analysis, Giesta<sup>2</sup> has observed and followed up 273 patients with a histopathologic diagnose of HL, between January 2000 and November 2011, in the state of Ceará. The highest incidence was found in the age group 10-39 years, with the average age of 29 years. In addition, in contrast to what was found in the north of Minas Gerais, 31 women in the aforementioned study died, which represents 11.35% of the total number of patients in that study.<sup>2</sup>

The higher number of admissions in the north of the state of Minas Gerais occurred in the private sector, confirming the situation found in the rest of the state since, from the 1,363 state hospitalizations, only 335 (24.5%) took place in the public sector. It was also observed that most of the expenses match a number of admissions and the

type of hospital, since 2011, for example, presented the highest number of admissions (28), all of them in the private sector and, therefore, presented the record of expenses: R\$ 28,491.73. However, it is important to note that, despite the number of cases being smaller from 2008 to 2009, the costs raised 15.9%. In contrast, from 2013 to 2014, the value of the expenses also increased, differing from the number of admissions that remained constant.<sup>6</sup>

Considering the whole state of Minas Gerais, the costs related to admissions by HL amount to R\$3,836,656.87, with 49.3% in the public sector and 50.7% in private hospitals. These values, almost identical, contradict the number of admissions in both types of hospitals, in the microregion of Montes Claros/Bocaiúva as well as in the whole state of Minas Gerais, since most of the expenses in these cases were made by the private sector.<sup>6</sup>

It is noteworthy that, at the world level, among the many types of cancer, the most common is the breast cancer, being the most prevalent among women in terms of death (23% of the total new cases annually). Since this cancer presents, in general, a good prognosis, these deaths likely result from a late diagnosis of this disease. This factor, therefore, might also be the explanation for the higher mortality rate in older women with HL cancer.<sup>8</sup>

Checking the System of Information on Cervical Cancer (*Sistema de Informação do Câncer do Colo do Útero*, Siscolo), from January 2004 to December 2013, Gandra *et al.*<sup>8</sup> observed that, in all this period, that the age group above 50 years presented the lowest amount of colposcopic exams performed. This situation matches the late diagnosis and the higher mortality rates found in older women, similar to the breast cancer and HL cases in female patients. Moreover, the incidence of cervical cancer is also higher from 20 to 29 years, a condition similar to the HL.<sup>9</sup>

The number of deaths by HL from 2008 to 2016 represented 4.35% of the total cases, showing the good prognosis of the disease and its low mortality, which is probably related to the technological advances in the diagnosis and treatments. This is also reported by Inca in 2017, which showed that the mortality was reduced by more than 60% since the beginning of the decade of 1970, as a result of the progress in the therapeutic.<sup>4</sup>

More than 90% of the cases of HL are cured, the first line treatment being generally the regimen of polychemotherapy ABVD (Doxorubicin, Bleomycin, Vinblastine, and Dacarbazine), associated or not to radiotherapy, as has been performed by the Hospital Universitário Walter Cantídio da Universidade Federal do Ceará - UFC and by the Hospital Haroldo Juaçaba/Instituto do Câncer do Ceará - ICC since 1996. In refractory and recurrent cases, there are many forms of treatment that normally end with the autologous transplant of stem cells.<sup>2,3</sup>

Nonetheless, despite the chemotherapy being a treatment that extends the survival of the cancer patients, it is still reported as one of the most difficult stages of the therapeutic process, if not the hardest. Women, for example, might become more vulnerable, present malaise, and even depression, especially after a possible hair loss. In this way, the reception of the diagnosis of this type of disease yields consequences that, in most of the cases, are negative to the female population, changing their physical, emotional, and social aspects.<sup>8</sup>

Therefore, it is important to remark the importance of the humanization of the procedures provided by the healthcare personnel that deal with these patients. They all, but especially the women, need to receive a differentiated care, in order to expand the actual possibilities of survival,

increasing the quality of life, and coping with the damages inflicted by the treatment.<sup>10</sup>

Currently, there are non-governmental initiatives that provide information about this disease and, consequently, contribute to an early identification and diagnose, which interferes directly in the healing percentage. The “*Movimento Contra o Linfoma*” (Movement Against Lymphoma), created in 2010, is a source of reliable information. Associations such as ABRALE (*Associação Brasileira de Linfoma e Leucemia*, Brazilian Lymphoma and Leukemia Association) is one of the most respected organizations, working throughout the country to promote the democratization of the treatment and life quality for people with hematological diseases (lymphoma, leukemia, multiple myeloma, myelodysplasia, ITP, myeloproliferative diseases).<sup>11</sup>

## CONCLUSION

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Based on the data analysis herein presented, we might conclude, not only for the north of the state of Minas Gerais but also to Brazil in general, that there is a prevalence of HL in brown women, with 20-29 years, most of which seek medical care in the private sector, resulting in high expenditures in this sector. The mortality rate was higher in patients above 40 years, although this rate is low compared to the total number of cases due to the effective control of the course of the disease in the north of the state of Minas Gerais.

Also, this investigation recorded a very small amount of bibliographic resources addressing this issue, which might be explained by the fact that HL is a rare neoplasia. However, this lack of investigations regarding this disease contributes to

late diagnosis and difficulties in the access to better therapeutic treatments, which is intrinsic related to the chances of survival of the patients.

Therefore, besides the early diagnosis and access to treatment, the life of many people with Hodgkin lymphoma might depend on the number of available hospital beds, qualified professionals, and update information. In this perspective, it is important to remark the influence of all the people that are part of the daily interactions of patients with HL, especially the health professionals, in order to enhance the providing of adequate medical assistance capable of promoting the recovery and cure of these patients. It is also important to mention the existence of projects that might contribute to the development of important links between the patients and the ones capable of providing an adequate healthcare service, thus contributing to the reduction of the mortality/morbidity rates of this disease.

## REFERENCES

1. MACHADO, A. C. S. *Linfoma de Hodgkin: biologia, diagnóstico e tratamento*. 2013. 82 f. Dissertação (Mestrado em Medicina) - Faculdade de Medicina, UC, Coimbra.
2. GIESTA, R. P. *Estudo do valor preditivo e prognóstico de marcadores imunológicos no linfoma de Hodgkin clássico, no ceará – Brasil*. 2012. 163f. Tese (Doutorado) - Fundação Antônio Prudente e Escola Cearense de Oncologia – ECO, Fortaleza.
3. LOPES, Gustavo Costa Baumgratz; MOREIRA, Wagner Brant; SOARES, Aleida Nazareth. Avaliação dos resultados do tratamento de pacientes portadores de linfoma de Hodgkin com esquema ABVD em primeira linha, *Revista Brasileira de Oncologia Clínica*, v. 8, n. 29, p. 112-120, jul-set, 2012.
4. BRASIL. Ministério da Saúde. Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA) [Internet] Linfoma de Hodgkin. Disponível em <[http://www.inca.gov.br/wps/wcm/connect/tiposdecancer/site/home/linfoma\\_hodgkin](http://www.inca.gov.br/wps/wcm/connect/tiposdecancer/site/home/linfoma_hodgkin)>. Acesso em: 16 Mar. 2017.
5. MONTEIRO, T. A. F. *et al.* Linfoma de Hodgkin: aspectos epidemiológicos e subtipos diagnosticados em um hospital de referência no Estado do Pará, Brasil, *Revista Pan-Amazônica de Saúde*, Ananindeua, v. 7, n. 1, p. 27-31, mar, 2016.
6. BRASIL. Ministério da Saúde. Sistema de Informações Hospitalares do SUS (SIH-SUS). Disponível em: <<http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sih/cnv/nimg.def>>. Acesso em: 11 Apr. 2017.
7. SOUZA, L. N. S. *et al.* Linfoma de Hodgkin na infância e adolescência: 15 anos de experiência com o protocolo DH-II-90, *Revista Brasileira de Hematologia e Hemoterapia*, São Paulo, v. 32, n. 4, p. 295-302, 2010.
8. SILVA, L. M.; SOUZA, M. S.; ALVES, C. R. Repercussões da mastectomia na vida sexual e afetiva das mulheres assistidas por um serviço de saúde do norte de Minas, *Revista Unimontes Científica*, Montes Claros, v. 18, n. 2, p. 84-95, jul-dez, 2016.
9. GANDRA, S. A. *et al.* Rastreamento do câncer do colo do útero em Montes Claros, Minas Gerais: análise de dados do Siscolo no período de 2004 a 2013, *Revista Unimontes Científica*, Montes Claros, v. 19, n. 1, p. 130-140, jan-jun, 2017.
10. MENDES, P. H. C. *et al.* Significado das sequelas faciais estéticas para indivíduos submetidos à cirurgia para tratamento de câncer de cabeça e pescoço, *Revista Unimontes Científica*, Montes Claros, v. 19, n. 1, p. 141-152, jan-jun, 2017.
11. BRASIL. Ministério da Saúde. Associação Brasileira de Linfoma e Leucemia (ABRALE) [Internet] Disponível em <<http://www.abrale.org.br/>>. Acesso em: 15 Apr. 2017.