Impact of Waiting Time for Colposcopy, Biopsy, and Conization in Women with Abnormal Cervical Cytology

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Impacto do Tempo de Espera para Colposcopia, Biópsia e Conização em Mulheres com Citopatologia Oncótica Alterada

Impacto del Tiempo de Espera para Colposcopía, Biopsia y Conización en Mujeres con Citopatología Oncótica Alterada

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ABSTRACT

Introduction: Cervical cancer is a public health challenge in Brazil, and despite prevention and early detection efforts, its diagnosis still faces obstacles. **Objective:** To analyze the waiting times between abnormal cervical cytology, colposcopy, biopsy, and anatomopathological in women assisted in the health Macro-region of Passos, Minas Gerais. **Method:** Retrospective cohort study conducted between 2019 and 2023, including 669 medical records of patients treated at a secondary care center. Three intervals were assessed: (A) between cytology and gynecological consultation; (B) between consultation and biopsy result; and (C) between biopsy result and anatomopathological report. Data were analyzed using means, standard deviations, and independent samples *t*-tests. **Results:** The mean waiting time was 91.05 days for interval A, 36.67 days for interval B, and 134.78 days for interval C. A significant difference was observed in interval A between residents of Passos and other municipalities, as well as in interval B between patients referred to the tertiary hospital and those managed in secondary care. The longest delay was found in interval C, regardless of patient origin or clinical outcome. **Conclusion:** The findings highlight substantial delays in the diagnostic pathway for cervical cancer, particularly between biopsy and conization, in addition to disparities related to place of residence and referral flow. These results underscore the need for reorganization of care pathways and strengthening of oncologic attention to reduce these disparities and optimize early diagnosis.

Key words: Uterine Cervical Neoplasms/diagnosis; Cytodiagnosis; Colposcopy; Biopsy; Time-to-Treatment/statistics & numerical data.

RESUMO

Introdução: O câncer do colo do útero é um desafio de saúde pública no Brasil e, apesar da prevenção e detecção precoce, o seu diagnóstico ainda apresenta obstáculos. **Objetivo:** Analisar os tempos de espera entre citologia oncótica alterada, colposcopia, biópsia e anatomopatológico em mulheres atendidas na Macrorregião de Saúde de Passos, Minas Gerais. **Método:** Estudo de coorte retrospectiva, conduzido entre 2019 e 2023, envolvendo 669 prontuários de pacientes acompanhadas em centro de atenção secundária. Foram avaliados três intervalos: (A) entre citologia e consulta ginecológica; (B) entre consulta e resultado da biópsia; e (C) entre resultado da biópsia e laudo do anatomopatológico. As análises incluíram médias, desvios-padrão e teste *t* para amostras independentes. **Resultados:** O tempo médio foi de 91,05 dias para o intervalo A, 36,67 dias para o intervalo B e 134,78 dias para o intervalo C. Identificou-se diferença significativa no intervalo A entre residentes de Passos e dos demais municípios, bem como no intervalo B entre pacientes encaminhadas ao hospital terciário e aquelas acompanhadas na atenção secundária. O maior atraso concentrou-se no intervalo C, independentemente da origem ou do desfecho clínico. **Conclusão:** Os resultados evidenciam atrasos no percurso diagnóstico do câncer do colo do útero, especialmente entre biópsia e conização, além de desigualdades associadas ao local de residência e ao fluxo de encaminhamento. Tais achados reforçam a necessidade de reorganização dos fluxos assistenciais e fortalecimento da Rede de Atenção Oncológica, visando reduzir desigualdades e otimizar o diagnóstico precoce.

Palavras-chave: Neoplasias do Colo do Útero/diagnóstico; Citodiagnóstico; Colposcopia; Biópsia; Tempo para o Tratamento/estatística & dados numéricos.

RESUMEN

Introducción: El cáncer de cuello uterino es un desafío de salud pública en el Brasil y, a pesar de la prevención y detección temprana, su diagnóstico aún presenta obstáculos. **Objetivo:** Analizar los tiempos de espera entre citología oncótica alterada, colposcopía, biopsia y anatomopatológico en mujeres atendidas en la macrorregión de salud de Passos, Minas Gerais. **Método:** Estudio de cohorte retrospectiva, realizado entre 2019 y 2023, que incluyó 669 historias clínicas de pacientes atendidas en un centro de atención secundaria. Se evaluaron tres intervalos: (A) entre la citología y la consulta ginecológica; (B) entre la consulta y el resultado de la biopsia; y (C) entre el resultado de la biopsia y el informe anatomopatológico. Los análisis incluyeron medias, desviaciones estándar y prueba *t* para muestras independientes. **Resultados:** El tiempo promedio fue de 91,05 días para el intervalo A, 36,67 días para el intervalo B y 134,78 días para el intervalo C. Se identificó una diferencia significativa en el intervalo A entre residentes de Passos y de otros municipios, así como en el intervalo B entre pacientes derivadas al hospital terciario y aquellas con seguimiento en la atención secundaria. El mayor retraso se concentró en el intervalo C, independientemente del origen o desenlace clínico. **Conclusión:** Los resultados evidencian demoras en el proceso diagnóstico del cáncer de cuello uterino, especialmente entre la biopsia y la conización, además de desigualdades asociadas al lugar de residencia y al flujo de derivación. Estos hallazgos refuerzan la necesidad de reorganizar los flujos asistenciales y fortalecer la red de atención oncológica, con el objetivo de reducir las desigualdades y optimizar el diagnóstico temprano.

Palabras clave: Neoplasias del Cuello Uterino/diagnóstico; Citodiagnóstico; Colposcopía; Biopsia; Tiempo de Tratamiento/estadística & datos numéricos.

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INTRODUCTION

Cervical cancer is the third most incident type in Brazilian women, except non-melanoma skin cancer[1]. Cervical cancer screening in asymptomatic women is based on oncotic cytology that detects abnormal cells and DNA-HPV test, recently included in the National Health System (SUS), that identifies the presence of the virus even before the onset of cell lesions[2,3]. The Brazilian cervical cancer screening guidelines of 2016[4] recommends that the majority of abnormal oncotic cytology should be referred for colposcopy evaluation by a specialized professional.

Although being a slow evolution cancer with possibility of prevention and early detection, 117,624 admissions by cervical cancer have been registered in Brazil, 65.74% of them in the South and Southeast regions[5]. According to the National Cancer Institute (INCA)[1], 1,610 cases per 100,000 women were estimated for 2026 in the state of Minas Gerais, ranked third with the highest absolute results. However, there is a significant disparity of access to health services in the state in relation to the time to begin the treatment, associated with the place of residence, the lowest waiting time was found in Minas Gerais southern municipalities[6,7].

Regardless of the high prevalence of cervical cancer in Brazil, there are no accurate data about the time to submit to colposcopy in women with abnormal results of oncotic colpocytology or the time to receive the biopsy results and of the anatomopathological — critical data for the diagnosis and treatment planning. The Brazilian cervical cancer screening guidelines of 2011 recommended that all the patients with cytology suggestive of high-grade lesion at primary attention should be referred to secondary attention to submit to colposcopy within three months after the result, however, this recommendation was removed from the 2016 guidelines[4,8].

Colposcopy-guided biopsy is usually the main obstacle of the diagnostic journey, especially in low- and middle-income countries due to the scarcity of qualified professionals, absence of full training, lack of standardized diagnostic patterns and poor quality control. This scenario negatively impacts the whole process since the identification of abnormal cytology until the disease outcome[9]. The objective of the present study is to analyze the waiting time for colposcopy, biopsy result and conization in women with abnormal colpocytology in Passos, Minas Gerais to contribute to improve screening and diagnosis of cervical cancer.

METHOD

Retrospective cohort study conducted at a secondary attention center called *Viva Mulher* between 2019 and 2023, the only existing unit to treat and follow-up women from 18 municipalities of the health region of Passos, a regional reference for the diagnosis and follow-up of cervical and breast cancer, playing a strategic role to articulate primary attention and other levels of care.

Data consisted in sociodemographic information as municipality of residence of the patient and the outcome classified between the referral for *Hospital Regional do Câncer*, a reference tertiary hospital to treat women with cervical cancer or follow up at *Viva Mulher* for those who do not need referral.

Initially, 669 charts have been identified, 68 of which were excluded for suspicion of vulvar cancer or lack of personal information, resulting in a final sample of 601 charts. Three chronological time frames were calculated in days: Time A, interval between the cytopathological exam and visit to the gynecologist of secondary attention for colposcopy; Time B, between gynecological visit and colposcopy-guided biopsy and Time C, time between the result of the biopsy by colposcopy and anatomopathological results post conization when indicated post-biopsy. Figure 1 portrays the selection flow.

The analyzes of waiting time were based on the comparison of means and standard-deviation (SD) and test *t* was applied to calculate statistical significance of independent samples. The Levene test was applied to evaluate the heterogeneity of the variances and the effect size by Cohen's d, Hedges correction and Glass's Delta with free version of IBM SPSS.

The Ethics Committee of *Hospital Regional do Câncer* approved the study, report number 7,187,599 (CAAE

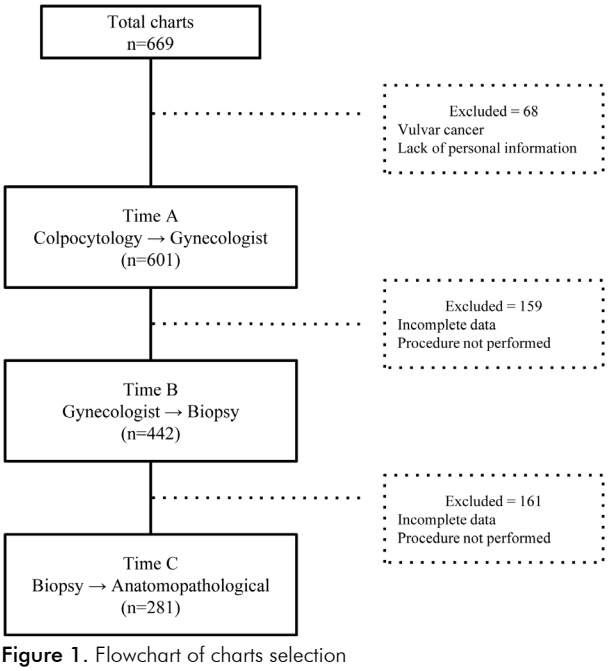

Figure 1. Flowchart of charts selection

(submission for ethical review): 83740624.5.0000.5112) in compliance with Directive 466/12[10] of the National Health Council (CNS). The anonymity and confidentiality of the information collected were ensured.

RESULTS

The comparative analysis of the mean times between the stages since colpocytology exam until the anatomopathological result was analyzed comparatively in two groups as portrayed in Table 1: (1) group treatment outcome, separating women referred to *Hospital Regional do Câncer* in oncologic treatment and those who were being followed up at the secondary attention center *Viva Mulher* without oncologic treatment and (2) group place of residence comparing women living in Passos and in adjacent cities part of the health region.

601 charts of all the patients were found with the date of the Pap smear and gynecologist visit (Time A), mean of 91.05 days (SD=90.53). There was no significant statistical difference among the groups referred to *Hospital Regional do Câncer* (mean = 81.40) and those followed-up at *Viva Mulher* (mean = 91.64; p=0.516). In contrast, there was significant difference between the group region with longer waiting time (mean=97.02) than the group Passos (mean = 75.13; p=0.002).

The analysis of 442 charts revealed a mean waiting time of 36.67 days (SD=55) for Time B (time between the gynecologist visit and result of colposcopy-guided biopsy). The groups of *Hospital Regional do Câncer* and *Viva Mulher* presented significant difference in mean times, 19.79 and 38.04, respectively (p<0.001), indicating least waiting time in the group *Hospital Regional do Câncer*. There was no statistically significant difference among women living in Passos (mean = 32.69) and in the region (mean = 38.35; p=0.263).

The interval between the biopsy result and the anatomopathological result post-conization (Time C) was investigated in 281 charts, revealing a mean time of 134.78 days (SD=96.25). The comparisons did not identify statistically significant differences between the groups of *Hospital Regional do Câncer* (mean = 118.63) and *Viva Mulher* (mean = 135.76; p=0.490) or among the residents of Passos (mean = 149.35) and of the region (mean = 128.78; p=0.190).

DISCUSSION

The present findings show the diagnostic process of cervical cancer in Passos, Minas Gerais. The first stage – the colpocytology exam until the clinical visit for colposcopy – lasted 91.05 days, close to the 90 days recommended by the Brazilian cervical cancer screening guidelines of 2011[8] and lower than the study of Nascimento et al.[11] with a mean waiting time of 94.5 days.

The lack of a clear Brazilian guideline on the time to perform the colposcopy is associated with heterogeneous international guidelines. The UK National Institute for Health and Care Excellence (NICE) determines well defined times of 2, 4 or 8 weeks, depending on the severity; in USA, the National Breast and Cervical Cancer Early Detection Program (NBCCEDP) recommends that 90% of the women with abnormal tests are evaluated, 75% of which within 90 days[12,13]. The World Health Organization (WHO) recommends colposcopy as fast as possible, ideally before three months for high-grade lesions[13]. Therefore, the time range found in Passos is consistent with WHO's, considering the mean of 75.13 days to evaluate the women living in the city.

The significant difference between the clinical visit and colposcopy among the cities, with high waiting time for other municipalities out of Passos, suggests disparity of geographical access to specialized care. The same process was observed in the study of Buss et al.[14] that, based on public data, demonstrated that the majority of the 38% of the women who submitted to colposcopy within six months from the abnormal oncotic cytology in the state of São Paulo lived in the metropolitan region.

The literature points out that delays in this stage compromise early diagnosis and the success of the therapeutic process. Alimena et al. observed that patients

Table 1. Analysis of the times according to outcome and residence

Time	Outcome					Residence				
	HRC		VM			Passos		Region		
	Total	Mean	Total	Mean	*p*	Total	Mean	Total	Mean	*p*
A	35	81.40	566	91.64	0.516	164	75.13	437	97.02	0.002
B	33	19.79	409	38.04	<0.001	131	32.69	311	38.35	0.263
C	16	118.63	265	135.76	0.490	82	149.35	199	128.78	0.190

Captions: HRC = Hospital Regional do Câncer, VM = Viva Mulher.

who did not submit to colposcopy within 12 months had two-fold the odds of being diagnosed with cervical cancer during follow-up compared with those who did[15].

The significant difference in Time B (initial gynecologic visit and biopsy result) between the groups *Hospital Regional do Câncer* (19.79 days) and *Viva Mulher* (38.04 days; $p<0.001$) suggests better celerity in the flow of patients referred to *Hospital Regional do Câncer*, because patients with suspected invasive lesions detected in oncotic colpocytology, abnormal clinical exams or major colposcopy findings need to be referred faster. Although colposcopy with biopsy should be performed in the first clinical visit ideally, the presence of menstrual flow or vulvovaginitis delays the exam, increasing the waiting time, since the first clinical date is the reference date to calculate the time.

WHO recommends a maximum time of two weeks for the histopathological diagnosis. The Brazilian Law number 13,896 dated October 30, 2019 determines that the required exams to elucidate the main diagnostic hypothesis of malignant neoplasm, if the case, be performed within 30 days based on the request of the responsible physician[16,17]. The referral timing of the group *Hospital Regional do Câncer* is consistent with WHO's and complies with the Brazilian legislation.

The mean of 134.78 days between the biopsy and the conization report (Time C) was not significantly and statistically different for both groups or among the cities investigated, revealing homogeneous time frames. The Brazilian Ministry of Health, NBCCEDP and NICE national and international guidelines, respectively, did not determine specific times for this interval, which explains the variability. In addition, as pointed out in the review by Nnaji et al.[18], this reality reflects a common pattern in low- and middle-income countries where health systems face structural challenges that directly impact the celerity of the diagnosis, exposing the necessity of investments and standardization of processes to improve the quality of the care.

In that line, the present study contributes substantially while providing unpublished data about waiting times of the diagnostic journey of cervical cancer in the region of Passos, revealing territorial disparities and pointing out critical steps that still need structuring. The localized obstacles exposed widens the knowledge of the Brazilian reality and offers concrete inputs for managers and lawmakers responsible for public policies aimed to reduce delays and promote equity of access to early diagnosis. However, the lack of electronic charts and flawed registers hinder the accurate analysis of time to provide care, and should be considered in the interpretation of the results.

CONCLUSION

The study revealed significant delays in the diagnostic journey of cervical cancer in the region of Passos, Minas Gerais with prolonged times across the stages. It is recommended to determine maximum time frames for the diagnostic stages and the adoption of strategies that promote better equity of access to reduce delays, qualify the care provided and improve the clinical outcomes of cervical cancer since screening and early cancer diagnosis.

CONTRIBUTIONS

All the authors contributed substantially to the conception and design of the study, acquisition, analysis and interpretation of the data, writing and critical review. They approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

DATA AVAILABILITY STATEMENT

All content underlying the text is contained in the manuscript.

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