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Prevalence of human papillomavirus and cervical neoplasia among women who have sex with women in Cameroon: A descriptive study

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Abstract

This descriptive study addresses a critical research gap by examining HPV and cervical neoplasia among women who have sex with women (WSW) in Cameroon, an underserved population. WSW typically undergo less frequent cervical cancer screening. We conducted a pilot study in Douala, Cameroon, recruiting WSW through Elle Cameroon, a community organization serving underserved populations. Working within the Cameroon Baptist Convention Health Services, participants underwent HPV screening and Visual Inspection with Acetic Acid (VIA) enhanced by Digital Cervicography (DC). We ran the frequencies and determined the p-values, prevalence odds ratios (POR) and prevalence risk ratios (PRR) using STATA 17. Statistical significance was set at 0.05. Of 26 participants enrolled, 19 (73.1%) provided valid HPV results, with 57.9% (11/19) testing positive for HPV. Also 80.8 % (21/26) of the participants were screened for cervical neoplasia and 19.05% (4/19) were positive. There was no significant association between HPV cervical neoplasia. Those who were HPV positive had 1.4 and 1.3 POR and PRR respectively. Our results suggest high prevalence of oncogenic HPV and cervical neoplasia among WSW in Cameroon. An adequately powered study is needed to further elucidate these findings and address healthcare disparities in this underserved population. *(Afr J Reprod Health 2025; 29 [12]: 122-130).*

Keywords: Women who have sex with women, Cervical cancer screening, Cameroon, Transgender men

Résumé

Cette étude descriptive explore la problématique des dépistages HPV et les néoplasies cervicaux chez les femmes ayant des rapports sexuels avec des femmes (FSF) au Cameroun. Très peu de recherches examinent l'importance du dépistage du cancer du col de l'utérus chez les FSF. Les FSF ne participent pas régulièrement aux dépistages du cancer du col de l'utérus. Dans cette étude pilote réalisée à Douala au Cameroun, nous avions recruter des FSF par l'intermédiaire d'une association communautaire au service des populations marginalise appeler Elle Cameroun. En collaboration avec les services de santé de la Cameroon Baptist Convention, les participantes se sont présentées pour dépistage du HPV et examen de col de l'utérus par une inspection visuelle à l'acide acétique (VIA) améliorée par cervicographie numérique. Nous avions analysé les mesures de fréquence, les rapports de cotes de prévalence (POR) et les rapports de risque de prévalence (PRR) à l'aide de STATA 17. La signification statistique a été fixée à 0,05. Sur les 26 participants inscrits, 19 (73,1 %) ont obtenu des résultats HPV valides, dont 57,9 % (11/19) positifs au HPV. Aussi, 80,8 % (21/26) des participants ont subi des dépistages de néoplasie cervicale, et 19,05 % (4/19) étaient positifs. Il n'y avait pas d'association significative avec le HPV / néoplasie cervicale. Les cas positives au HPV avaient 1,4 et 1,3 POR et PRR respectivement. Nos résultats suggèrent une prévalence élevée du HPV oncogène et de néoplasie cervical chez Les FSF au Cameroun. Une étude a grande population est nécessaire pour élucider davantage ces résultats et identifier les disparités de santé dans cette population marginalisée. *(Afr J Reprod Health 2025; 29 [12]: 122-130).*

Mots-clés: Femmes ayant des relations sexuelles avec d'autres femmes, dépistage de cancer du col de l'utérus, homosexualité

Introduction

Cervical cancer persists as a significant public health challenge, particularly in Low-and-Middle-Income Countries (LMICs), where it remains the leading cause of cancer-related morbidity and mortality among women, as evidenced by global cancer surveillance data.[1] While the disease is

largely preventable through human papillomavirus (HPV) vaccination and regular screening, certain populations face distinct barriers to accessing these preventive services, leading to significant disparities in health outcomes.

Women who have sex with women (WSW) represent one such underserved population, facing unique challenges in accessing appropriate healthcare services. Despite evidence suggesting comparable or potentially higher rates of sexually transmitted infections (STIs) among WSW compared to women who have sex with men (WSM), WSW typically undergo less frequent cervical cancer screening.[2] This disparity stems partly from a widespread misconception among WSW about their perceived low risk for STIs,[3] coupled with structural barriers to healthcare access. As highlighted in a recent systematic review, misconceptions about STI risk persist among healthcare providers, contributing to inadequate risk assessment and preventive care recommendations for WSW.[4]

The intersection of WSW health and cervical cancer prevention in LMICs remains particularly understudied. A comprehensive systematic review examining studies between 1980 and 2013 identified only 24 articles reporting quantitative results on sexual health and risk behaviors among WSW in LMICs.[5] This reviews highlighted patterns, including infrequent use of protective measures during sexual activities that could transmit STIs, including HPV. This research gap continues to impede evidence-based healthcare delivery for WSW in resource-limited settings.

The situation in sub-Saharan Africa (SSA) deserves particular attention, as the region bears a disproportionate burden of cervical cancer incidence and mortality, with rates as high as two-folds more than the global cervical cancer burden.[6] This disparity is particularly pronounced in Cameroon, where Zhang *et al.*[7] documented cervical cancer as the second most common cancer among women aged 15-44 years. Limited healthcare infrastructure, cultural barriers, and stigma surrounding sexual health create significant challenges in implementing comprehensive cervical cancer prevention programs across the region.[8]

The intersection of these challenges with the healthcare needs of WSW presents unique concerns. While guidelines for cervical cancer screening do not differ between WSW and WSM, and studies have demonstrated a similar prevalence of cervical cytology abnormalities in both groups, access to and utilization of screening services remain suboptimal among WSW.[9] Disparities may be even more pronounced in conservative societies where same-sex relationships face significant stigma.[10] Furthermore, healthcare providers in SSA often lack training in WSW-specific health needs, potentially compromising the quality of care these women receive.[5]

This knowledge gap is particularly concerning given the potential heightened risk for HPV and cervical dysplasia among WSW in LMICs. Research suggests that delayed healthcare seeking among WSW may result in more advanced disease at diagnosis.[11] Of particular concern is the relationship between smoking and cervical cancer risk in this population. Studies have consistently shown higher rates of smoking among sexual minority women compared to heterosexual women, with some estimates suggesting up to twice the prevalence.[12] Given that smoking is an established cofactor in cervical carcinogenesis and has been associated with persistent HPV infection,[13] this elevated smoking prevalence may compound cervical cancer risk among WSW.

This present descriptive study aims to address this critical research gap by examining the prevalence of HPV and cervical neoplasia among WSW in Cameroon. The research leverages existing healthcare infrastructure through the Women's Health Program (WHP), a successful cervical cancer screening initiative run by the Cameroon Baptist Convention Health Services (CBCHS). The CBCHS operates one of Cameroon's largest healthcare networks, with 95 facilities across eight of the country's ten regions, screening an average of 8,000 women annually for cervical cancer.[14] To reach the WSW population, WHP partnered with Elle Cameroon, a community organization in Douala that promotes women's health with a focus on underserved groups, including WSW, women with disabilities, single mothers, and female sex workers. Our findings will inform screening efforts to reach high-risk populations in Cameroon and other LMICs, potentially serving as a foundation for larger-scale investigations across SSA. Furthermore, this research responds to recent calls to identify and address disparities in cervical cancer

prevention among underserved populations as part of the call by WHO to eliminate cervical cancer worldwide by 2030.

Of note, WSW are faced with severe health disparities. They face direct HPV/STI exposure through genital-genital and digital-genital contact,[15] with cofactors such as smoking and alcohol use potentially increasing infection persistence and immune suppression.[16] Healthcare system barriers encompass provider knowledge gaps, limited WSW-affirming services, and structural obstacles including cost and screening modality limitations.[17]

Methods

Study design and setting

We conducted a pilot descriptive study in Douala, Cameroon, recruiting participants through Elle Cameroon, a community organization promoting women's health with a focus on underserved populations. The study was conducted within the framework of the Women's Health Program (WHP) run by the Cameroon Baptist Convention Health Services (CBCHS), a large faith-based healthcare organization operating in eight of Cameroon's ten regions.

Participants

The study included self-identified WSW aged 19 years and older. Any woman who admitted practicing sexual activities with women was eligible for the study. This included lesbians, bisexual women and even heterosexual women who practiced same sex sexual activity irrespective of the reason. We excluded women who were pregnant or had undergone total abdominal hysterectomy. Recruitment occurred through Elle Cameroon's existing networks in Douala. As a pilot study, we envisaged a small sample size of 60 but many of the eligible participants were skeptical of the study. We attended to a total of 53 women but 27 later withdrew their consents due to fear of exposure, and their data has been excluded from this study. Thus, we ended with a sample size of 26.

Procedures

All HPV specimens from study participants were provider-collected using the AmpFire HPV brush. The specimens were collected by separating the labia with the non-dominant hand and inserting the AmpFire brush into the vagina with the dominant hand. This was followed by a cervical examination using Digital Cervicography (DC) as an adjunct to Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) with the aid of a bi-valve vaginal speculum. The AmpFire system, Atila BioSystems, Sunnyvale, CA, USA, a multiplex isothermal real-time fluorescence assay, was used to detect 14 high-risk HPV types while simultaneously genotyping types 16 and 18. Cervical cancer screening with AmpFire HPV triaged to VIA/VILI-DC has been described in our previous work.[19] The screening took place from 17th to 25th of March 2023.

Clinical examinations included assessment for cervicitis and pelvic inflammatory disease through cervical inspection and bimanual examination. For participants who had never experienced penetrative vaginal intercourse or could not tolerate speculum examination (n=6), modified screening protocols were employed, and woman was screened only for HPV. Participants with VIA-VILI-DC lesions received thermal ablation (TA) or Large Loop Excision of the Transformation Zone (LLETZ) according to WHO protocol. Those with lesions suspicious of invasive cervical cancer underwent ectocervical punch biopsies for histopathological examination. TAs and biopsies were provided at the spot at Elle Cameroon while LLETZ were provided at the WHP clinic in Mboppi Baptist Hospital, Douala.

Data collection and analysis

Data were collected using standardized WHP enrollment forms and a supplemental questionnaire focusing on WSW-specific health risks and challenges. All participants were assigned unique study identifiers, and data were entered into a secure Epi Info database.

We analyzed the frequences and conducted association test between the characteristics of the participants and HPV and cervical neoplasia results to determine p-values. We also cross tabulated HPV results and cervical neoplasia to determine prevalence odds ratios (POR) and prevalence risk ratios (PRR) using STATA version 17. Statistical significance was set at the 0.05.

We did not conduct logistic regression analysis due to the very small sample size.

Ethical considerations

The study received approval from the Institutional Review Boards of the CBCHS (IRB2023-04). Informed consent to participate was obtained from all the participants in the study. This research was conducted in compliance with the Helsinki Declaration. All Participants signed an informed consent, and they were free to withdraw their participation if they felt to do so at any time.

Results

Our study aimed to determine the prevalence of HPV and cervical neoplasia among WSW in Cameroon and to identify factors associated with these conditions in this understudied population.

Respondents' characteristics

The study enrolled 26 participants with an average age of 28.2 (±5.32), which ranged from 19 to 40 years. Most of them were in the age group 30 - 40 years (57.7%, 11/26). Proportions of the participants who were single/separated (73.1%, 19/26) and have attained at least 7 years of education (92.3%, 24/26) were relatively high. In terms of religion, most of the participants were Christians (65.4%, 17/26) and this was predominantly Catholics (50%, 13/26).

Table 1: Respondents' demographic, clinical and behavioral characteristics

Variable/Category	Frequency (n)	Percent (%)	SE	95% CI Lower	Upper
Age (Years) - Mean=28.81, SD-5.32, Range:19-40					
19-29	11	42.31	0.1	23.35	63.08
30-40	15	57.69	0.1	36.92	76.65
Marital Status					
Married	7	26.92	8.7	11.57	47.79
Single	17	65.38	9.33	44.33	82.79
Separated	2	7.69	5.23	0.94	25.13
Education					
0-7 years	2	7.69	5.23	0.94	25.13
8-14 years	13	50	9.81	29.93	70.07
15-17 years	9	34.62	9.33	17.21	55.67
18+yrs	2	7.69	5.23	0.94	25.13
Religion					
Baptist	1	3.85	3.77	0.1	19.64
Catholic	13	50	9.81	29.93	70.07
Pentecostal	3	11.54	7.27	2.45	30.15
Muslim	3	11.54	7.27	2.45	30.15
Other	6	23.08	8.26	8.97	43.65
Occupation					
Domestic Workers	3	11.54	7.27	2.45	30.15
Employed	5	19.23	10.85	4.46	54.51
Self-Employed	8	30.77	9.05	14.33	51.79
Teacher	1	3.85	3.77	0.1	19.64
Trader	6	23.08	8.26	8.97	43.65
Student	3	11.54	7.27	2.45	30.15
HIV Status					
Negative	26	100			
HPV Status					
Positive	11	57.89	11.32	33.5	79.75
Negative	8	42.11	11.32	20,25	65.5
Cervical Neoplasia					
Positive	4	19.05	8.57	5.45	41.97
Negative	17	80.95	8.57	58.09	94.55
Smoking					
Yes	9	34.62	9.33	17.21	55.67
No	17	65.38	9.33	44.33	82.79
Alcohol Intake					
Yes	15	57.69	0.1	36.92	76.65
No	11	42.31	0.1	23.35	63.08

SE=Standard Error, CI= Confidence Interval

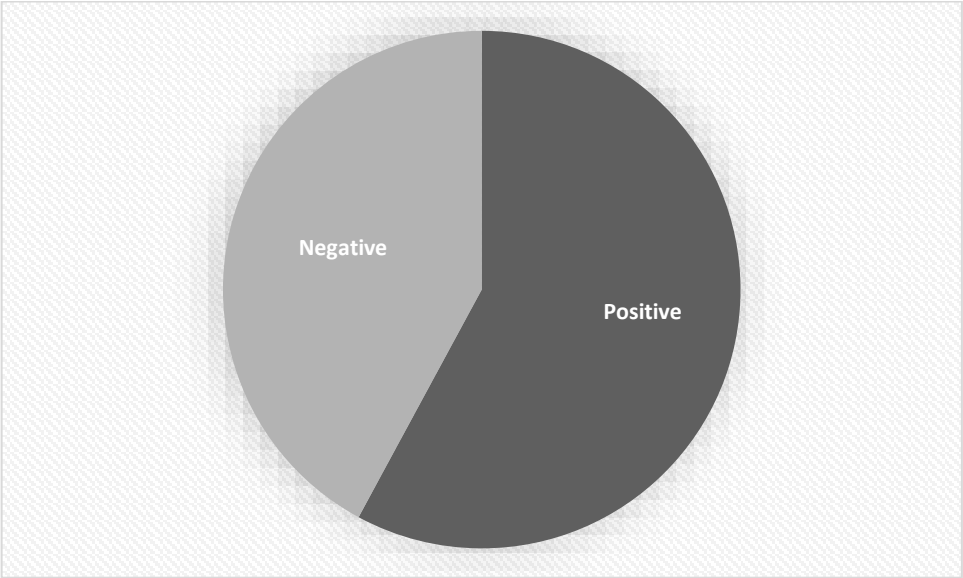

Figure 1: Prevalence of HPV infection among respondents

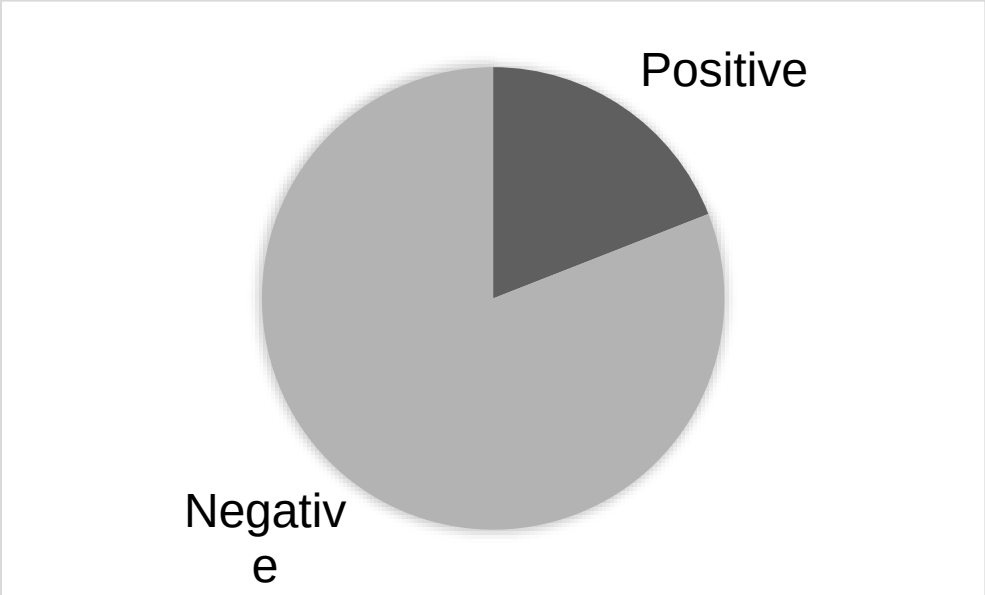

Figure 2: Prevalence of cervical neoplasia among respondents

About one-third of the participants were self-employed (30.8%, 8/26) and traders (23%, 6/26) as shown in Table 1.

Respondents had varied test results, all (100%, 26/26) reported that they were HIV negative, 57.9% (11/19) tested HPV positive and 19.1% (4/21) had cervical neoplasia. There were participants who smoked cigarettes (34.6%, 9/26) and some who consumed alcohol (57.7%, 15/26) as shown in Table 1.

Respondents' characteristics according to HPV Status

The HPV results of 19 participants indicated that 57.9% (11/19) tested HPV positive (Figure 1). These results were analyzed to determine the association between HPV infection and characteristics of the participants. We found no significant association between HPV infection and the characteristics of the participants (Table 2).

Table 2: Respondents' characteristics according to HPV status

Variables /Category	HPV Positive Freq (N)	Percent (%)	HPV Negative Freq (N)	Percent (%)	p-value
Age					
19-29	3	27.27	3	37.5	0.636
30-40	8	72.73	5	62.5	
Marital Status					
Single	4	36.36	2	25	0.865
Married	6	54.55	5	62.5	
Separated	1	9.09	1	12.5	
Education					
0-7 years	1	9.09	1	12.5	0.965
8-14 years	6	54.55	4	50	
15-17 years	4	36.36	3	37.5	
Religion					
Baptist					
Catholic	6	54.55	3	37.5	0.78
Pentecostal	1	9.09	1	12.5	
Muslim	2	18.18	1	12.5	
Other	2	18.18	3	37.5	
Occupation					
Domestic Workers	1	9.09	2	25	0.278
Employed	1	9.09	2	25	
Self-Employed	6	54.55	1	12.5	
Teacher	1	9.09	0	0	
Trader	2	18.18	3	37.5	
HIV Status					
Negative	11	100	8	100	
Smoking					
Yes	3	27.27	3	37.5	0.636
No	8	72.73	5	62.5	
Alcohol Intake					
Yes	3	27.27	3	37.5	0.636
No	8	72.73	5	62.5	

Participant's characteristics for according to cervical neoplasia

Out of the 21 WSW screened for cervical neoplasia, 19.1 % (4/21) were positive (Figure 2). The results of cervical neoplasia were crossed examined with the characteristics of the participants but there was little significant association. Only occupation (p=0.005) had a significant association with cervical neoplasia (Table 3).

Association between HPV and cervical neoplasia

The test results for HPV and cervical neoplasia were represented in a contingency table to determine the association between the two infections. This enabled the calculation of prevalence Odds Ratio (1.4, (2/7)/(1/5)) and Prevalence Risk Ration (1.3, (2/9)/(1/6)), Table 4. Prevalence of cervical neoplasia among participants who tested positive for HPV and cervical neoplasia was 20% (3/15*100).

Table 3: Respondents' characteristics for according to cervical neoplasia

Variable /Category	Cervical Neoplasia Freq (n)	Percent (%)	No Cervical Neoplasia Freq (n)	Percent (%)	p-value
Age					
19-29	2	50	7	41.18	0.586
30-40	2	50	10	58.82	
Marital Status					
Single	2	50	4	23.53	0.635
Married	2	50	12	70.59	
Separated	0	0	1	5.88	
Education					
0-7 years	0	0	1	5.88	0.518
8-14 years	4	100	9	52.94	
15-17 years	0	0	6	35.29	
18+yrs	0	0	1	5.88	
Religion					
Baptist	0	0	1	5.88	0.231
Catholic	1	25	9	52.94	
Pentecostal	2	50	1	5.88	
Muslim	0	0	3	17.65	
Other	1	25	3	17.65	
Occupation					
Domestic Workers	0	0	1	5.88	**0.005**
Employed	0	0	4	23.53	
Self-Employed	0	0	7	41.18	
Teacher	0	0	1	5.88	
Trader	4	100	1	5.88	
Student	0	0	3	17.65	
HIV Status					
Negative	4	100	17	100	
HPV Status					
Positive	2	66.67	7	58.33	0.659
Negative	1	33.33	5	41.67	
Smoking					
Yes	2	50	6	35.29	0.618
No	2	50	11	64.71	
Alcohol Intake					
Yes	2	50	11	64.71	0.618
No	2	50	6	35.29	

Table 4: Cross tabulation between positive HPV and cervical neoplasia

Variable/ Category		Cervical Neoplasia Positive	Negative	Total
HPV Results	Positive	2	7	9
	Negative	1	5	6
Total		3	12	15

Discussion

Our findings suggest a high prevalence of HPV (57.9%) and cervical neoplasia (19.1%) among Women who have Sex with Women (WSW) in Cameroon, demonstrating the potential burden of HPV-related cervical disease in this underserved population. This highlights the need to re-evaluate existing assumptions regarding HPV risk in WSW.

The HPV prevalence observed in our study is higher than some previously reported rates of 25 to 40% in the general female population in Cameroon[2,18,19], suggesting that WSW may face unique risk factors contributing to HPV acquisition. Previous research has established that HPV can be transmitted through non-penetrative sexual activities,[15] which are common among WSW.

However, misperceptions of lower STI risk in this group often lead to inadequate screening.[20,21] Compared to studies in high-income countries, where HPV prevalence among WSW varies widely, our findings emphasize the urgent need for targeted research in LMICs where data remain scarce.

Several factors contribute to the disparities in HPV prevalence and cervical neoplasia among WSW in Cameroon. Stigma surrounding same-sex relationships can lead to reluctance in seeking preventive healthcare services.[22] Additionally, there is a lack of WSW-specific health information and guidelines tailored to their needs, leading to misconceptions about their HPV risk. Many healthcare providers in the region may not be adequately trained to offer inclusive and nonjudgmental care, further limiting WSW's access to screening services.[23] Structural barriers, such as cost, geographic inaccessibility, and fear of discrimination, may also contribute to increase HPV prevalence rates in this population.[4,11,24,25]

Our study employed a community-based recruitment approach through Elle Cameroon, ensuring engagement with WSW in a culturally competent manner. Partnering with a trusted community organization facilitated participant recruitment and reduced barriers to study participation. However, this approach may have introduced selection bias, as participants who were already engaged with LGBTQ+ advocacy or health programs may have been more likely to participate. Despite this limitation, leveraging community partnerships was crucial in reaching a population that is often marginalized in healthcare research.

The study's small sample size limits the generalizability of our findings, necessitating larger studies to confirm these results. The single-center nature of our study further constrains the broader applicability of our findings across diverse settings in Cameroon. Additionally, the reliance on self-reported sexual identity and behaviors introduces potential misclassification bias. Finally, we did not separate WSW who have male partner(s) and WSW without male partner(s) in our study; two groups of WSW who might carry different rates of risk factors.

Our findings highlight the urgent need for WSW-specific health education programs to correct misconceptions about HPV risk and the importance of regular cervical cancer screening. Culturally competent training for healthcare providers is essential to ensure inclusive care for sexual minority women. Additionally, community-based screening programs, such as those facilitated by Elle Cameroon, could serve as effective models to increase screening uptake in this population. Given the challenges some WSW face in tolerating traditional screening methods, modified screening protocols, including self-sampling HPV tests,[26,27] should be explored to enhance accessibility.

Given the study's limitations, larger multi-site investigations are needed to further elucidate HPV prevalence and associated risk factors among WSW in Cameroon and other LMICs. Additionally, intervention studies assessing the effectiveness of tailored educational campaigns and alternative screening methods, such as self-sampling, could inform best practices for improving cervical cancer prevention in this population. Ultimately, addressing these disparities will require inclusive and equitable healthcare initiatives.

Availability of data and materials

All data generated or analyzed for this study have been included in this published article.

Competing interests

The authors have no competing interest to declare.

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Contributions of authors

Conception: SM, GL; Data Acquisition: MS, MM, KN, FM; Data Analysis: NE, JN, KN; Writing the Manuscript: SM, GL, CC. All authors mentioned in the article approved the manuscript.

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