Clinical Outcomes of Women who attend the Cameroon Baptist Convention Health Services (CBCHS) with Cervical Cancer

Ngalla C[1,2]*, Manjuh F[1], Joël F[2] and Elit L[1,3]

[1]*Women's Health Program, Cameroon Baptist Convention Health Services, Cameroon*

[2]*NewCastle University Upon Tyne London, UK*

[3]*The University of Texas MD Anderson Cancer Center, USA*

[4]*Department of Obstetrics and Gynecology McMaster University Canada, Canada*

*Corresponding author: Ngalla C, Women's Health Program, Cameroon Baptist Convention Health Services, NewCastle University Upon Tyne London, Cameroon

ARTICLE INFO

ABSTRACT

Introduction: Cervical cancer ranks as the fourth most frequently diagnosed cancer and the fourth leading cause of cancer-related deaths among women globally. In LMIC, most women with cervical cancer are diagnosed at an advanced stage, partly because they have limited access to a proper diagnosis. Treatment options are limited due to limited access to radiation therapy. Thus, survival outcomes are poor. There is no data on this issue in Cameroon, so we undertook to determine the survival outcomes for women who present with cervical cancer to the CBCHS.

Method: Data was extracted from the cervical screening and diagnostic Women's Health Program (WHP) database. All cases of cervical cancer were followed through the CBCHS oncology service, so management and clinical outcomes were available. Outcomes were categorized as alive with disease, alive without disease or dead. Kaplan-Meier (KM) curves for survival were plotted stratified by age, HIV status and histologic subtype. The Cox regression model for survival analysis was used to determine the impact of some variables on the mean time of patient survival after diagnosis.

Results: Between 2013 and 2018, 752 women were diagnosed with cervical cancer. The average age at cervical cancer diagnosis was 53.33 (+/-13.82), with a mean survival time of 2.34 years (+/-2.00). Within five years of diagnosis, the overall survival for women diagnosed with cervical cancer was 27.1%. 285 (37.5%) cases diagnosed did not go in for treatment. 387 (51.5%) went in for treatment, including 205 who did not complete their treatment. Age at diagnosis (HR 1.007 (95% Cl (1.000-1.013), p=0.035), a positive HIV status (HR 1.032 (95%Cl (0.930-1.145)) p = 0.558), and histologic subtype of adenocarcinoma (HR 1.026 (95% Cl (0.705-1.493), p=0.894) were associated with lower survival (although these associations were not statistically significant).

Conclusion: A diagnosis of cervical cancer is a serious threat to the health of women especially in LMIC like Cameroon. Survival from the disease is extremely poor in this country, consistent with data from other LMICs. Most cases present late with symptoms, and the majority cannot afford treatment reflected by the very few who attend recommended forms of treatment or are unable to complete it. Education, and awareness around primary and secondary prevention and universal health care funding are necessary steps to strengthen cervical cancer control in Cameroon.

Keywords: Cervical Cancer; HPV; Survival; Late Stage; Diagnosis; Cameroon

Abbreviations: KM: Kaplan-Meier; WHP:Women's Health Program; LMIC: Low And Middle-Income Countries; GLOBOCAN: Global Cancer Observatory; CBCHS: Cameroon Baptist Convention Health Services; RSTMH: Royal Society of Tropical Medicine and Hygiene; NIHR: National Institute of Health Research

Background

Cervical cancer is a disease that involves the malignant transformation of cells that line the human cervix. According to global statistics, cervical cancer ranks as the fourth most frequently diagnosed cancer and the fourth leading cause of cancer-related deaths among women [1]. Cervical cancer remains a global threat with a progressive increase in prevalence noted over the years [2-4]. An estimated 604,000 cases were diagnosed with cervical cancer in 2020 with about 342,000 deaths [5]; 85% of cases and 87% of deaths occur in low and middle-income countries(LMIC) [6]. In Africa, cervical cancer is responsible for most cancer-related deaths within the four regions (Eastern, Central, Southern, and Central) [6]. It is ranked second most African countries but first in terms of mortality [6]. Diagnosis, treatment and research in the cancer field require adequate pathology services. Pathology is necessary for cancer registration to guide good estimation of cancer incidence and mortality [7]. These values on cervical cancer from Global Cancer Observatory (GLOBOCAN) might be underrated significantly in Africa, where there are still minimal diagnostic facilities, lack of infrastructure, limited personnel, and generally very poor pathology services [7]. Hence, this creates an urgent need for training and networking in the field of pathology across Africa [8]. Furthermore, survival from cervical cancer in various countries is a complex association of several factors such as disease awareness, screening programs availability, socioeconomic factors, staging at diagnosis, availability of treatment infrastructure and health personnel to provide timely and appropriate care [9]. Cancer registry data generally offers an opportunity to calculate generalizable survival estimates with approximate current scenarios in the context of various countries [9]. The critical role of cancer registries has evolved beyond just reporting. The 5-year survival rate in developed countries such as the USA is quite high 68% compared to African countries with poor clinical outcomes and survival [9].`

Cameroon is a low and middle-income country (LMIC), recording 2770 cases of cervical cancer annually, with 1787 deaths making cervical cancer 13.4% of all cancers diagnosed in the country with an annual prevalence of 40 per 100000 [10]. Like in most LMICs, women are mostly diagnosed at an advanced stage (approximately 68% of cases), have limited access to proper diagnosis and treatment, have a prolonged waiting time during treatment mainly due to limited radiotherapy machines, and have multiple breakdowns from the ones available and generally poor survival outcomes from the disease [10,11]. The reason for late diagnosis is further attributed to a lack of diagnostic facilities, lack of knowledge on the pathway of care for the community health workers that refer women with symptoms, lack of trained personnel in the field of cervical cancer screening, surgeons (like gynecologists and gynecologic oncologists), lack of treatment facilities (like 1 functional private radiation unit in the country and no access to brachytherapy in the country) and equipment [6]. All these factors lead to women presenting late in their cervical cancer diagnosis [6,12].

The Cameroon Baptist Convention Health Services (CBCHS) is a large faith-based healthcare organization with a network of 85 health facilities located in nine of the ten regions of Cameroon. The CBCHS implemented the Women's Health Program (WHP) in 2007 primarily to fight against cancer of the cervix. This has been going on within this organization for more than a decade now. The WHP has become Cameroon's largest cervical cancer prevention program and, it operates in 13 of the CBCHS facilities across Cameroon. So far, the program has screened more than 100000women against cervical cancer. Since the creation of this program, no study has been conducted to determine the clinical outcomes of women diagnosed with cervical cancer within the CBCHS. The aim of this study was to determine the clinical outcomes of women within 0-5 years after being diagnosed with cervical cancer in Cameroon Baptist Convention Health Services (CBCHS) Institutions.

Materials and Methods

Setting and Procedure

This study was a retrospective cohort study that involved cervical cancer patients diagnosed in the Cameroon Baptist Convention Health Services (CBCHS) within five years (2013-2018) by the Women's Health Program (WHP). They were grouped into proportion alive with disease, alive without disease or death. The convenience sampling technique was employed and patients with a histologic diagnosis of cervical cancer between 2013 to 2018 in CBCHS were included in the study. No other method of sampling was used. Patients with an available histologic diagnosis of cervical cancer from their records in the WHP database were included in the study. Women with a histologic diagnosis of cervical cancer on whom outcome data could not be obtained using cell phone contact were excluded from the study. This is because Cameroon has no vital statistics/cancer registry, so to better know the outcomes for these patients they had to be called.

Data Management and Analysis

A data collection tool was developed on Microsoft Excel Spreadsheet 2016. Data was extracted from the WHP database and used to complete this sheet. Parameters included age, date of diagnosis, HIV status, treatment or not, type of treatment, alive (with or without disease) or death, and histologic subtype of cervical cancer.

- Alive with disease are cases who survived for at least 5 years with cervical cancer, seeking different health facilities for a cure are, while alive without disease are cases who got cured of cervical cancer within the same period.

- Complete treatment involves cases that went through their full course of therapy, while incomplete treatment are those who could go through treatment.

- Complete response are cases whose tumor was utterly destroyed with treatment, while those with incomplete response had a partial decrease in tumor size and symptoms.

Data analysis was done using SPSS version 21. Descriptive statistics such as modes, means, proportion median, and standard deviation were represented on bar charts, frequency tables and histograms. T-tests, correlational coefficients bivariate analysis was carried out on different parameters with p< 0.05 considered statistically significant. Cervical cancer clinical outcomes were categorized as alive with disease, alive without disease or dead. Kaplan-Meier (KM) curves of clinical outcomes were plotted stratified by age, HIV status and histologic subtype. Univariate and multivariate Cox regression model for survival analysis was used to determine the impact of some variables on the meantime of patient survival after diagnosis. This study involved records of human subjects, and therefore, ethical clearance was obtained from the Institutional Review Board of Cameroon Baptist Convention Health Services (CBCHS) on May 23rd 2022 IRB number IRB2022-47. Also, this was a retrospective study of disease and treatment, but since not all outcomes were documented, patient contact was used. This study got support from Royal Society of Tropical Medicine and Hygiene (RSTMH) through their small grants awardee program in partnership with the National Institute of Health Research (NIHR) ((link: https://rstmh.org/grants/grant-awardees-2021/nihr-awardees-2021).

Results

The results of this study are categorized into: descriptive statistics (like mean, standard deviation) of age variable, the proportion of cases diagnosed according to various histologic subtypes of cervical cancer (squamous cell carcinoma and adenocarcinoma), dichotomous clinical outcomes of women diagnosed with cervical cancer (alive with disease, alive without disease, dead, and unknown). The study population mainly consisted of women between middle to old age with an established histological diagnosis of cervical cancer. A total of 752 women were diagnosed with histologically confirmed invasive cervical cancer. We excluded 37 women from some aspects of data analysis due to missing data, e.g., no information on the type of treatment, lack of information on survival time and unknown HIV status. During the study period, 752 women were diagnosed with cervical cancer among 7.5 million women who live in Cameroon and were at risk of developing cervical cancer.

Mean Age of Diagnosis of Cervical Cancer

(Table 1) Information on the age at diagnosis could be easily obtained from the database with no missing value. The mean age of patients diagnosed with cervical cancer could be estimated from the sample size of N=752. According to analysis, the mean age of cervical cancer diagnosis, according to this study, stood at 53.33 years with a standard deviation of (+/-13.822). On the other hand, the overall mean time of survival of cervical cancer for this study was 2.34 years (+/-2.003), implying most cases diagnosed with cervical cancer could not live beyond this period. Thirty-Seven cases were left out in the survival estimates, given that there was no data to measure this within a five-year period after diagnosis had been established. In this population, (546(72.6%)) women diagnosed with cervical cancer in t were aged at least forty-five years while (206(27.4%)) were less than forty years (Figure 1).
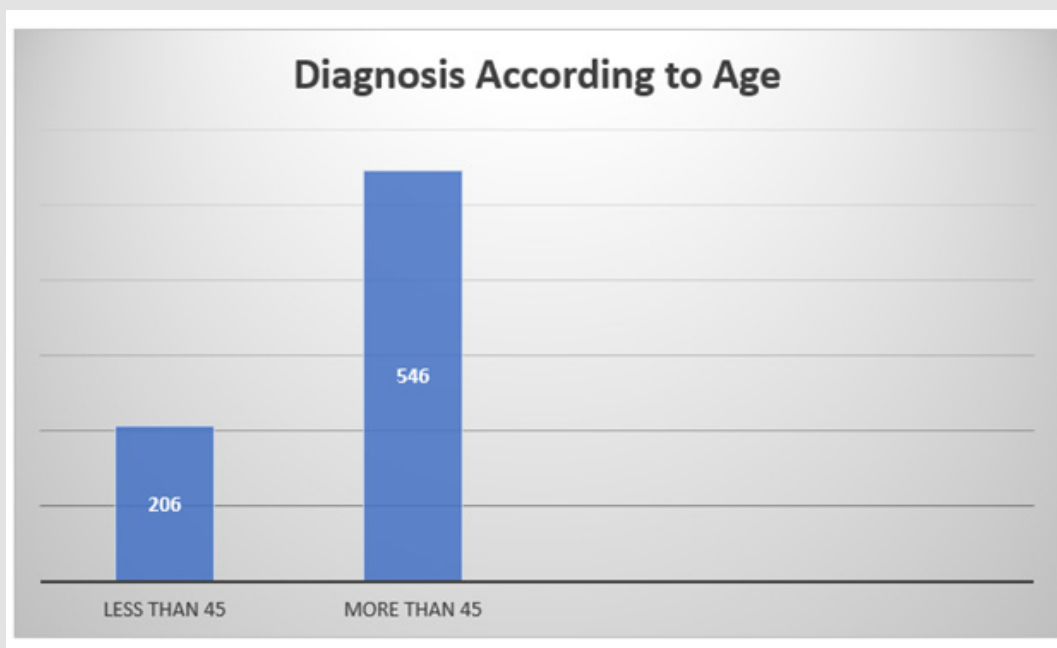

Figure 1: Diagnosis According to Age.

Table 1: Mean Age of Cervical Cancer as Diagnosis at CBCHS.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	752	20	96	53.33	13.822
Mean time (Survival) in years	715	0	5	2.34	2.003

Proportion of Cervical Cancer Cases by Sub-Type

(Table 2) In this study, 94.3% (N=709) of cervical cancer cases diagnosed were invasive squamous cell carcinomas of the cervix, while 5.7% were adenocarcinomas (N=43). All histology identified was classified into these two subtypes.

Table 2: Proportion of Cervical Cancer Cases by Subtype.

	Frequency	Percent	Cumulative Percent
Adenocarcinoma	43	5.7	5.7
Squamous	709	94.3	100
Total	752	100	

Clinical Outcome of Cervical Cancer Cases

(Table 3) This study categorized clinical outcomes into 4: alive with disease, alive without disease, death or unknown. Up to 68% (N=511) of patients diagnosed with cervical cancer died within the 5 years period (2013-2018), 20.1% (N=151) were still alive with the disease, and 7% (N=53) alive without the disease.

Therapies Undertaken by Patients

Comparing partial, complete and no treatment (Tables 4 & 5).

Treatment Response: (Table 6) Based on this review, 387 (51.5%) of women with cervical cancer diagnosed at the CBCHS went in for a form of therapy among which 205 (27.3%) did not complete treatment, 52 (6.9%) were still undergoing treatment and 130 (17.3%) were able to follow treatment to the end. Also, among those who took treatment, 98 (13%) had a complete response while 150 (20%) had a partial response. All of those with a complete response (98(13%) were able to follow a form of therapy to the end. 329(43.8%) did not engage in any form of therapy. Carrying out the chi-square test gave a p-value of 0.000($p<0.05$), implying that most of those diagnosed were unable to finish treatment.

Table 3: Clinical Outcome of Cervical Cancer Cases.

Clinical outcome				
	Frequency	Percent	Valid Percent	Cumulative Percent
Alive With Disease	151	20.1	20.1	20.1
Alive without Disease	53	7	7	27.1
Dead	511	68	68	95.1
Unknown	37	4.9	4.9	100
Total	752	100	100	

Table 4: Comparing Partial, Complete and No Treatment.

		Completed treatment				Total	%
		NO	ONGOING	UNKNOWN	YES		
Treated	No	328(43.6%)	0	1(0.13%)	0	329	43.8
	Unknown	0	0	36(4.8%)	0	36	4.8
	Yes	205(27.3%)	52(6.9%)	0	130(17.3%)	387	51.5
Total		533	52	37	130	752	100%

Table 5: Evaluating treatment completion.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	947.964[a]	6	0
Likelihood Ratio	557.508	6	0
Linear-by-Linear Association	166.395	1	0
N of Valid Cases	752		

Table 6: Evaluating Treatment Response.

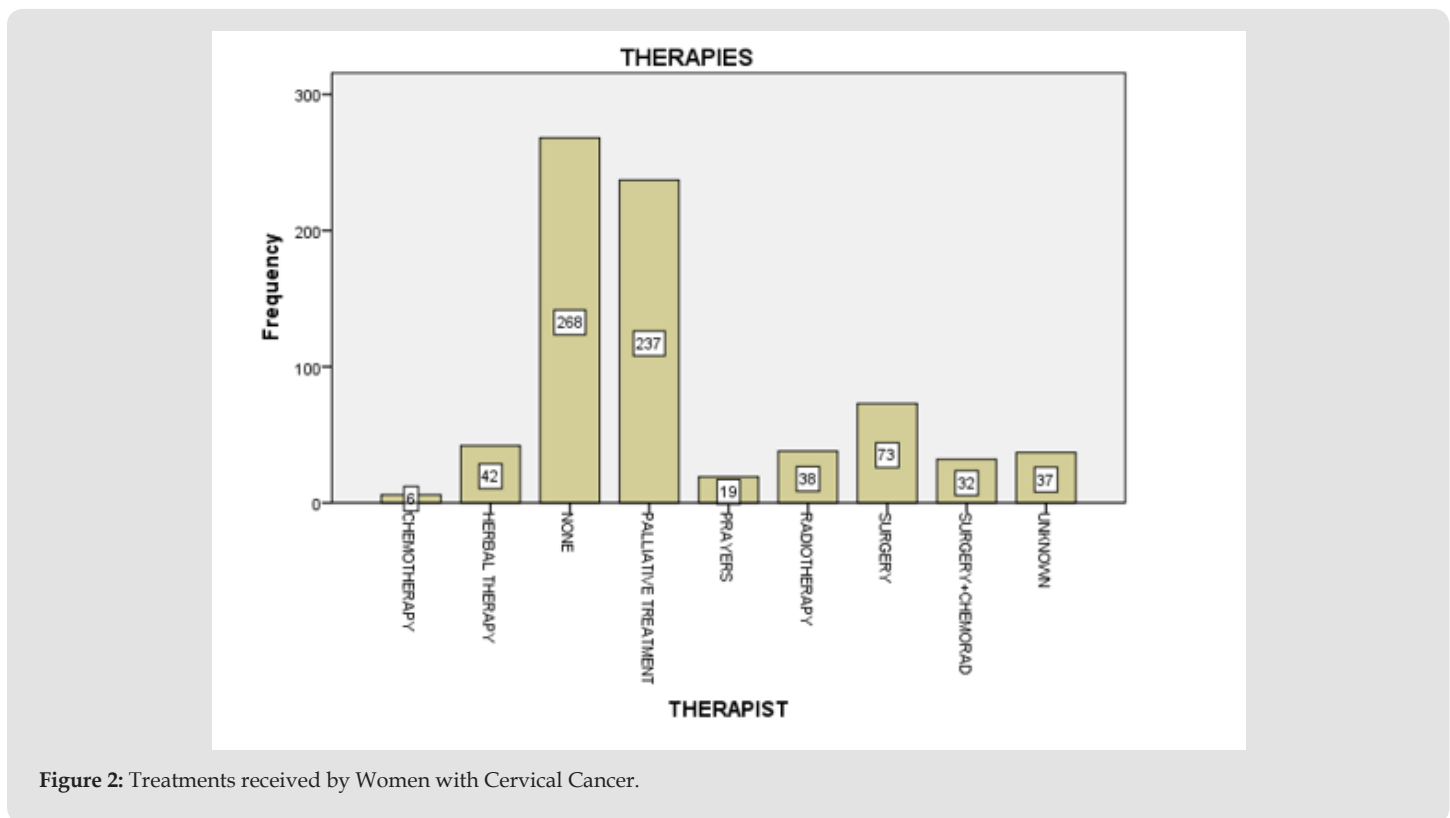|		Respond					Total
		Complete	Incomplete	None	Ongoing	Unknown	
Treated	No	0	4	324	0	1	329
	Unknown	0	0	0	0	36	36
	Yes	98(13%)	150	66	73	0	387
Total		98	154	390	73	37	752

Figure 2: Treatments received by Women with Cervical Cancer.

Summary of Therapies Reported by Cases:

Bar Chart Summarizing Various Therapies Undertaken by Cervical Cancer Patients: (Figure 2) shows that most of the women diagnosed with cervical cancer a the CBCHS did pursue some form of management while palliative was the most common form of treatment engaged by those who could afford or access a form of treatment.

Table 7: Comparing survival outcomes by types of therapies.

		Clinical Outcome				Percentage	Total
		Alive with disease	Alive without disease	Dead	Unknown		
Therapies	Chemotherapy	4(0.6%)	1(0.1%)	1(0.1%)	0	0.8	6
	Herbal Therapy	23(3.2%)	0(0%)	19(2.7%)	0	5.9	42
	None	12(1.7%)	0(0%)	256(35.8%)	0	37.5	268
	Palliative Treatment	91(12.7%)	0(0%)	146(20.4%)	0	33.1	237
	Prayers	6(0.8%)	0(0%)	13(1.9%)	0	2.7	19
	Radiotherapy	10(1.4%)	5(0.7%)	23(3.2%)	0	5.3	38
	Surgery	5(0.7%)	26(3.6%)	42(5.9%)	0	10.2	73
	Surg+Chemort	0(0%)	21(2.9%)	11(1.6%)	0	4.5	32
	Unknown	0	0	0	37		
Total		151	53	511	37	100	715

Comparing Clinical Outcomes by Types of Therapies: As summarized in the table 7 above, most of the patients 256(35.8%) did not enroll in any form of active therapy. Chemotherapy recorded the least used first line treatment strategy (6(0.8%)). A significant proportion of women enrolled for palliative care 237(33.1%) (Figure 2). Interestingly, quite a significant number reported prayers 19 (2.7%) and herbal therapy 42 (5.9%) as their forms of management. Among the women who used herbs or prayer alone as forms of treatment, most died within 5 years after diagnosis: prayer (13/19) 68.4% and herbal therapy (19/42) 45.2%. No cure was recorded among women depending on prayer and herbal therapy, but a few survived within the five-year period still with disease. A significant proportion of women who did not receive any management for their cervical cancer died within five years after diagnosis 256(35.8%).

Kapler-Meier Curve of Survival

From the chart above, most of the women who chose no treatment began dying within one year after diagnosis with a survival probability of about 0.04. This is compared to the women who received surgery or chemoradiation, as their probability of survival was 66% at five years (Figure 3).
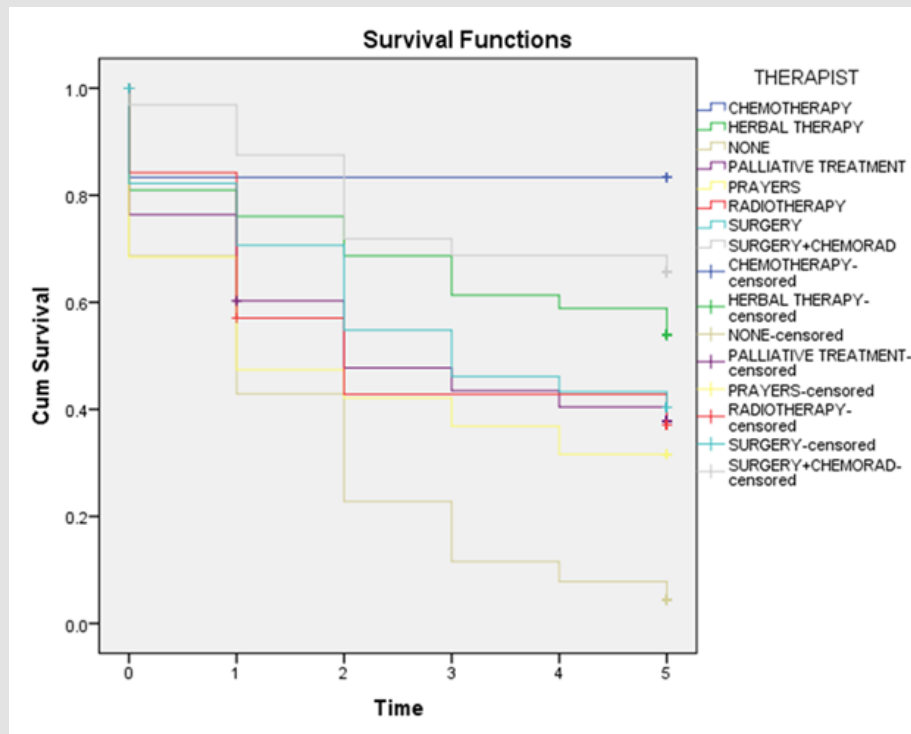

Figure 3: Survival curve.

Table 8: Test of equality of survival distributions for the different levels of treatment.

Overall Comparisons			
	Chi-Square	**df**	**Sig.**
Log Rank (Mantel-Cox)	131.399	7	0
Breslow(Generalized Wilcoxon)	88.435	7	0
Tarone-Ware	108.483	7	0

Table 9: Cox regression model analysis of Survival.

Omnibus Tests of Model Coefficientsa								
-2 Log Likelihood	**Overall (score)**			**Change From Previous Step**			**Change From Previous Block**		
	Chi-square	**df**	**Sig.**	**Chi-square**	**df**	**Sig.**	**Chi-square**	**df**	**Sig.**
6248.313	5.013	3	0.171	4.961	3	0.175	4.961	3	0.175
Variables in the Equation									
	B	**SE**	**Wald**	**df**	**Sig.**	**Exp(B)**	**95.0% CI for Exp(B)**		
							Lower	**Upper**	
Age At Diagnosis	0.007	0.003	4.424	1	0.035	1.007	1	1.013	
Hiv Status	0.031	0.053	0.343	1	0.558	1.032	0.93	1.145	
Histologic Sub-Type of Cancer	0.025	0.192	0.018	1	0.894	1.026	0.705	1.493	

Test of Significance Among Treatment Types

Our null hypothesis is that all the management strategies give the same outcome. A p value of 0.000(p<0.0.5) means that there was a difference in survival that varied by management strategy (Table 8).

Cox Regression Model Analysis of Survival

In the survival analysis, increasing age at diagnosis was significantly associated with a lower survival (p value of 0.035, hazard ratio 1.007 (95% Cl (1-1.013)) (Table 9). A positive HIV status was also associated with a lower survival, although this association was not statistically significant (p value of 0.558, hazard ratio 1.032(95%Cl (0.930-1.145)), as well as histologic subtype of cancer (p value of 0.894, hazard ratio of 1.026(95% Cl(0.705-1.493)).

Discussion

Various factors have been identified according to the worldwide literature as direct influencers to cervical cancer survival: age at diagnosis, sociocultural factors, the stage of cervical cancer at diagnosis, and tumor size and volume (13). This section compares our findings with findings from similar studies carried out in other countries. This study is the first study conducted in Cameroon to evaluate cervical cancer survival. The average age of cervical cancer diagnosis in this study stood at 53.33 (+/-standard deviation 13.822). This result is quite similar to that seen in an analysis of registries in [13] African countries from 2005-2015 to determine survival in patients diagnosed with invasive cervical cancer. In a population n=2735 with cervical cancer, the average age of diagnosis was 53.4years (standard deviation ±14.5) [6,14]. In contrast, in the United Kingdom (UK) and other high-income countries, cervical cancer

incidence peaks in the age group (30-34) years [15]. Most women diagnosed with cervical cancer in our study were aged at least forty-five years (546 (72.6%)), while the proportion less than forty-five years was (206 (27.4%)). These are similar findings to a study carried out in Bhutan, where out of 357 cases of cervical cancer, a majority were aged 45 years and above (219 (61.3%) and recorded poorer survival within five years of follow-up [16]. This implies as a woman ages, her risk of developing cervical cancer also increases according to the following estimates from former studies: less than 20(0.1%), 20 to 34 years. (13.7%), 35 to 44 (22.8%), 45 to 54 years (22.4%) and 55 to 64 (19.7%) [17]. The findings from our study likely reflect that earlier asymptomatic disease is found at younger ages (i.e., UK findings), whereas symptomatic, more advanced stage disease is identified in older women (our study and Bhutan).

According to our study, the overall survival for women diagnosed with cervical cancer through the CBCHS was 27% at 5 years while 20.1% were still living with disease and 7% were alive disease free. The rest were either dead (68%) or could not be accounted for (4.9%). Based on an estimate, 95% of women will survive 5 years when the cancer is localized while only 13% will survive distant disease [18]. A low survival of 27% implies most women presented with late disease (though our study is limited by lack of staging information to verify this). In developing countries like Cameroon, most cases of cervical cancer present late similar to findings from other developing countries like Ghana, Uganda, South India, Iran, Nepal, Tanzania, Ethiopia [19-22]. A survival rate of 27% at 5 years (for women diagnosed through the CBCHS) is in sharp contrast to the overall observed survival of women with 40.2% (37.9-42.5) at 5 years among a cohort of women with cervical cancer from 13 African cancer registries, 49% in a study

carried out in Uganda [23], 45% in a 3-year study carried out in Zimbabwe, 63.2% in a study carried out in Morocco [24-25] but very similar to 5-year survival in Ethiopia 28.4% [26]. A previous study comparing the five-year cervical cancer survival from SSA compared to developed countries like the USA reported 5-years survivals as 33% and 80% [14] respectively likely reflecting a very wide gap in the success of early diagnosis and treatment of cervical cancer compared to diagnosis and management at time of symptomatic disease with advanced staged disease.

Further, according to our study, the mean time of surviving cervical cancer was 2.34 years (+/-2.003) implying most diagnosed patients were most likely to die within 2.34 years after diagnosis is established. This is the case in most SSA countries where women with cervical cancer mostly present with symptomatic advanced disease and cannot afford treatment [18]. In addition, our study showed that many women with cervical cancer do not go for treatment and died the quickest (i.e., within five years after diagnosis 256 (35.8%)). The results of this study reveal that women diagnosed with cervical cancer at older ages are more likely to have a reduced overall survival rate. This implies that 5-year survival for cervical cancer is higher in women at younger ages and decreases with increasing age. The association between age at diagnosis and survival in cervical cancers is consistently found in the literature including in recent study [6]. Various management strategies were reported by women in this study. The main categories were palliative care, surgery, chemotherapy, or chemoradiation plus surgery. According to classification based on survival, women who received chemotherapy (n=6) recorded the highest survival (5/6(83.3%) followed by 32 women who attended chemoradiation plus surgery (21/32(65.6%)). Despite its relatively low curative potential compared to other cervical cancer standard treatments, chemotherapy has a role in prolonging cervical cancer survival especially through symptom management [27]. Surgery remains the standard of care for cervical cancer especially if diagnosed early with surgery or surgery plus chemoradiation for high-risk factors [28].

The big role of surgery is not reflected in this study in terms of optimal survival given that most patients present late with disease as reflected by an overall survival of 27.1% while those who could afford both surgery and chemoradiation had better outcome. A large number of women with cervical cancer (n=285) did not enroll for any form of active management for their cervical cancer (268/715 (37.5%)) and hence recorded the worst survival outcomes (12/268(4.48%)). Their outcome reflects the natural progress of the disease without medical intervention. The prognostic value of parameters like HIV status, age at diagnosis and histology subtype, were evaluated using the cox regression model to determine if they influenced survival. Interestingly increasing age at diagnosis was significantly associated with a lower survival (p value of 0.035, hazard ratio 1.007 (95% Cl(1-1.013)) (table 9). A positive HIV status was also associated with a lower survival, although this association was not statistically significant (p value of 0.558, hazard ratio 1.032(95%Cl (0.930-

1.145)), as well as histologic subtype of cancer (p value of 0.894, hazard ratio of 1.026(95% Cl (0.705-1.493)). Apart from the other two factors, the role of HIV status in cervical cancer survival has not been adequately evaluated. Based on our study, 94.3% of the cancers were squamous cell compared to 5.7% being to adenocarcinomas. This contrasts findings from developed countries which put the values at 85% vs 15%, respectively [29]. This result is similar to a study from Ethiopia which categorizes the tumors into: Adeno-squamous 2 (1%), Adenocarcinoma 7 (3%) and Squamous Cell Carcinoma 233 (96%) respectively [26]. This result is also similar to a study carried out in Morocco where squamous cell carcinoma (SCC) histology was the most common pathological type and was reported in 94% of cases followed by adenocarcinoma in 5.5 % of cases. This may reflect the quality of the pathologic diagnosis and lack of access to immunohistochemistry staining in CBCHS and Cameroon in general.

Based on findings from this study, most women (387 (51.5%)) with cervical cancer went in for a particular form of therapy. In this group, 205(27.3%) did not complete treatment, 52(6.9%) were still undergoing treatment and 130(17.3%) were able to follow treatment to the end. Cancer of cervix shows significant differences in outcome worldwide depending on stage at presentation to the country's health system, access to high-quality care and the ability to begin and complete treatment [30]. These two depend on individual factors and local or country-specific available, accessible and affordable diagnostic and treatment services [30]. Most of the cases in this study who embarked on a form of treatment could not take it to the end. On the other hand, a significant number did not go in for any form of treatment at all 256 (35.8%). This could be attributed to a wide gap currently in need and actual availability of treatment, affordability of radiotherapy, chemotherapy and surgical services as is the case in most LMIC countries [31]. Among cases who took treatment, 98(13%) had a complete response while 150 (20%) had a partial response. Treatment and schedule adherence is recommended to improve control of disease and overall survival (OS) in locally advanced cervical cancer. From this study, all cases with a complete response (98 (13%) were able to follow a form of therapy to the end and hence were free from the disease within 5 years. Surgery recorded the highest cure rate within five years (26 (3.6%)) followed by surgery plus chemoradiation (21(2.9%). Surgery remains the gold standard for managing cervical cancer, especially if diagnosed early [32].

Previous studies have shown no significant difference in the outcome of patients managed by surgery alone or surgery plus chemoradiation [32]. In this study, there was no statistically significant difference in the outcome of patient based on the treatment served. Our study lacks stage information and details on the final surgical pathologic findings to put these results into context. Herbal treatment involves the use of plants found in Cameroon to treat diseases. These herbs are prescribed by traditional health practitioners using indigenous knowledge and belief systems [33]. The beliefs towards this form of treatment are so deeply rooted within indigenous societies that most people use herbs before

seeking help through the hospital. Only when the herbs fail to help, do people attend healthcare services [33,34]. In this study, up to 5.9% of the women sought herbal treatment implying that traditional healers in Cameroon can play a significant role in directing women with cervical cancer symptoms early for assessment and management. Our study showed the population's strong belief in prayers and spiritual healing. This is reflected in the 2.7% who went in for prayers. This shows that cervical cancer has both a physical and emotional-psychologic-spiritual component that reaches out for care. Cervical cancer remains a serious threat to the health of women especially in LMIC like Cameroon where screening coverage is still extremely low. Navigation in care is still a serious problem in Cameroon and so much needs to be done to empower women diagnosed with cervical cancer through education, awareness creating, support and funding.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

1. (2021) GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin.

2. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, et al. (2010) Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer 127(12): 2893-2917.

3. (2012) World Health Organization Cervical Cancer: Fact Sheets by Population, Int Agency Res Cancer.

4. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, et al. (2018) Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 68: 394-424.

5. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, et al. (2021) Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 71(3): 209-249.

6. Johnson CA, James D, Marzan A, Armaos M (2019) Cervical Cancer: An Overview of Pathophysiology and Management. Semin Oncol Nurs [Internet] 35(2): 166-174.

7. Wilson ML, Ayers S, Berney D, Eslan A, Guarner J, et al. (2018) Improving anatomic pathology in sub-saharan Africa to support cancer care. Am J Clin Pathol 149(4): 310-315.

8. Williams T Gynaecological Pathology Reporting Cervical Pathology.

9. Johnson CA, James D, Marzan A, Armaos M (2019) Cervical Cancer: An Overview of Pathophysiology and Management. Semin Oncol Nurs [Internet]. 35(2): 166-174.

10. Country-specific I, Cancer Y, Method R, Country-specific M, Cervix B, Both OC, et al. 26 545 864. 2021; 170: 2020-1.

11. Enow Orock E, Ndom P, Doh s (2012) Current cancer incidence and trends in Yaounde, Cameroon. Oncol Gastroenterol Hepatol Reports 1(1): 58-63.

12. Denny L, Anorlu R (2012) Cervical cancer in Africa. Cancer Epidemiol Biomarkers Prev 21(9): 1434-1438.

13. Stapley S, Hamilton W (2011) Gynaecological symptoms reported by young women: examining the potential for earlier diagnosis of cervical cancer. Fam Pract 28(6): 592-598.

14. Sengayi Muchengeti M, Joko Fru WY, Miranda Filho A, Egue M, Akele Akpo MT, et al. (2020) Cervical cancer survival in sub-Saharan Africa by age, stage at diagnosis and Human Development Index: a population-based registry study. Int J Cancer 147(11): 3037-3048.

15. Data were published by the Welsh Cancer Intelligence and Surveillance Unit, Health Intelligence Division, Public Health Wales.

16. Tshewang U, Satiracoo P, Lenbury Y (2021) Survival Analysis of Cervical Cancer Patients: A Case Study of Bhutan 22(9): 2987-2993.

17. The American College of Obstetricians and Gynecologists. Cervicalcancer.

18. Tshewang U, Satiracoo P, Lenbury Y (2021) Survival Analysis of Cervical Cancer Patients: A Case Study of Bhutan. 22(9): 2987-2993.

19. Kaku M, Mathew A, Rajan B (2008) Impact of socio-economic factors in delayed reporting and late-stage presentation among patients with cervix cancer in a major cancer hospital in South India. Asian Pac J Cancer Prev 9(4): 589-594.

20. Behnamfar F, Azadehrah M (2015) Factors associated with delayed diagnosis of cervical cancer in Iran - a survey in Isfahan city. Asian Pac J Cancer Prev 16(2): 635-639.

21. Mwaka AD, Garimoi CO, Were EM, Roland M, Wabinga H, et al. (2016) Social, demographic and healthcare factors associated with stage at diagnosis of cervical cancer: cross-sectional study in a tertiary hospital in northern Uganda. BMJ Open 6: 1-9.

22. Tigeneh W, Abera Molla, Ayenalem Abreha, Mathwose Assefa (2015) Pattern of cancer in Tikur Anbessa specialized hospital oncology center in Ethiopia from 1998 to 2010. Int J Cancer Res Mol Mech 1(1).

23. Wabinga H, Ramanakumar AV, Banura C, A Luwaga, S Nambooze, et al. (2003) Survival of cervix cancer patients in Kampala, Uganda: 1995-1997. Br J Cancer 89(1): 65-69.

24. Elmajjaoui S, Ismaili N, El Kacemi H, Kebdani T, Sifat H, et al. (2016) Epidemiology and outcome of cervical cancer in national institute of Morocco. BMC Womens Health 16(1): 1-8.

25. Chokunonga E, Ramanakumar AV, Nyakabau AM, Margaret Z Borok, Z Michael Chirenje, et al. (2004) Survival of cervix cancer patients in Harare, Zimbabwe, 1995-1997. Int J Cancer 109(2): 274-277.

26. Deressa BT, Assefa M, Tafesse E, Kantelhardt E J, Soldatovic I, et al. (2021) Contemporary treatment patterns and survival of cervical cancer patients in Ethiopia. BMC cancer 21(1): 1102.

27. Liontos M, Kyriazoglou A, Dimitriadis I, Dimopoulos MA, Bamias A (2019) Systemic therapy in cervical cancer: 30 years in review. Crit Rev Oncol Hematol [Internet] 137: 9-17.

28. Annede P, Gouy S, Haie Meder C, Morice P, Chargari C (2019) Place of radiotherapy and surgery in the treatment of cervical cancer patients. Cancer/Radiotherapie [Internet] 23(6-7): 737-744.

29. (2016) ICO. Human Papillomavirus and Related Diseases Report.

30. Kruk ME, Gage AD, Arsenault C, Keely Jordan, H H Leslie, et al. (2018) High-quality health systems in the Sustainable Development Goals era: Time for a revolution. Lancet Glob Health 6(11): e1196-e1252.

31. Meara JG, Leather AJM, Hagander L, Blake C Alkire, Nivaldo Alonoso, et al. (2015) Global Surgery 2030: Evidence and solutions for achieving health, welfare, and economic devel-opment. Lancet 386: 569-624.

32. Abu Rustum NR, Sonoda Y (2010) Fertility-sparing surgery in early-stage cervical cancer: indications and applications. J Natl Compr Cancer Netw JNCCN 8(12): 1435-1438.

33. Ramgoon S, Dalasile NQ, Paruk Z, Patel CJ (2011) An exploratory study of trainee and registered psychologists' perceptions about indigenous healing systems. S Afr J Psychol 41(1): 90-100.

34. Latif SS (2010) Integration of African traditional health practitioners and medicine into the health care management system in the province of Limpopo. Stellenbosch: University of Stellenbosch.

Assets of Publishing with us

- Global archiving of articles
- *Imm*ediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

https://biomedres.us/