RESEARCH ARTICLE

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Characteristics of Women Diagnosed with Invasive Cervical Cancer in Ghana

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Abstract

Objective: To describe the characteristics of women diagnosed with invasive cervical cancer from 2010 to 2013 in two large hospitals in Ghana. **Method:** Medical records and other hospital data on women diagnosed with invasive cervical cancer were collected from the Komfo Anokye and Korle-Bu Teaching Hospitals. Data were recorded onto a standardized data collection sheet and analyzed using summary statistics. **Results:** For of the 1,725 women with invasive cervical cancer who were included in the study, parity was high (5 and more births). The most common diagnostic investigation undertaken was a cervical biopsy, performed for 95.5% of cases. Few women had an imaging test performed as part of the diagnostic process (3.3%). Some had comorbid conditions at diagnosis (29.3%). Only 61% of women attended at least one follow-up appointment after diagnosis of their cancer. **Conclusion:** Our study suggests that more work is needed to improve patient education and access to diagnostic and treatment facilities to reduce the incidence and mortality of cervical cancer in Ghana. Additionally, improvement in data quality is needed to provide more complete data for cancer control in Ghana.

Keywords: Ghana- cervical cancer- follow-up- characteristics

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Introduction

In Africa, invasive cervical cancer is the second most common cancer after breast cancer and the leading cause of cancer death among women with an estimated 99,038 new cases and 60,098 deaths in 2012 (Ferlay et al., 2013). In West Africa, incidence rates of invasive cervical cancer are estimated to be high in Senegal, Liberia, Mali and Ghana, and lower in Cote D'Ivoire and Togo relatively (Ferlay et al., 2013). These differences may reflect the wide cultural, geographic, ethnic and environmental variations that influence sexual behavior and the prevalence of sexually transmitted diseases in different parts of the continent (Morhason-Bello et al. 2013). They may also reflect methodological differences in the assessment of cancer incidence such as coverage by a cancer registry.

In Ghana, cervical cancer is the most common cancer among women (Ferlay et al., 2013). There is currently no national cervical screening program in Ghana. However, there are a few hospitals and organized bodies such as churches and corporate institutions that offer screening with the Pap smear, visual inspection with acetic acid, or human papillomavirus (HPV) DNA testing. This screening is offered on an opportunistic basis. Detailed data on the characteristics of women diagnosed with invasive cervical cancer in Ghana are not routinely collected. Additionally, there are currently no well-organized data on the follow-up of women diagnosed with invasive cervical cancer.

There are two public hospitals that offer treatment for cancer: Korle-Bu Teaching Hospital (KBTH), Accra and the Komfo Anokye Teaching Hospital (KATH), Kumasi. The Swedish Ghana Medical Center is a private oncology center that offers radiotherapy and chemotherapy to cancer patients. However, most cancer cases are seen and treated at KBTH and KATH. In addition to providing treatment to cancer patients, both hospitals have a cancer registry. We examined the characteristics of newly diagnosed invasive cervical cancer in the 2010-2013 time period for women presenting to the two hospitals in Ghana.

Materials and Methods

The method for identifying cases for this study has been described previously (Nartey et al., 2016; Nartey et al., 2017). In summary, the study population consisted of all histologically and clinically confirmed cases of invasive cervical cancer in KATH and KBTH from 2010

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to 2013. Through the review of paper-based, electronic and pathology medical records at the Oncology Units and the Department of Obstetrics and Gynecology of the two hospitals, information on women newly diagnosed with invasive cervical cancer was collected. Physicians' writing was occasionally difficult to read. In this instance, a physician was sought to help understand the sentences. Where the outcome of the disease was not documented in medical records, the patients or a relative was telephoned. Data were entered onto a standard questionnaire that included demographic details, comorbid conditions, treatment and follow-up.

Specific past medical history and comorbid conditions were considered present if they were documented in the patient's medical records. The region of residence was derived from the place of residence recorded in the medical record. The occupations of women were also obtained from the medical record. Parity was recorded in the medical records for some women as 5+ and others 7+ births, necessitating three categorizations of parity to assess its relationship to the occurrence of cervical cancer. The International Federation of Gynecology and Obstetrics (FIGO) stage at diagnosis was dichotomized into localized (FIGO I-II) and advanced cancer (FIGO III-IV) and variables associated with advanced disease assessed by logistic regression.

Approval for this study was granted by the University of Otago Ethics (Health) Committee, Ghana Health Service Ethical Committee and the Committee on Human Research, Publication and Ethics of the Kwame Nkrumah University of Science and Technology (KNUST) and KATH, Ghana.

STATA was used to describe proportions or percentages of the variables of interest. A p-value of less than 0.05 was used to define statistical significance. Multivariate logistic regression was conducted to examine the effect of stage of disease on various factors while controlling for potential confounding. Variables such as region of residence and occupation which have been shown to impact the stage at presentation were chosen for the logistic regression. Potential confounding variables examined were all variables in the model. Variables yielding an adjusted odd ratio (OR) appreciably different from the unadjusted estimate were identified.

Results

For 49 and 23 medical folders of women diagnosed with invasive cervical cancer recorded in the electronic records at the Oncology Units at KATH and KBTH, respectively, the diagnosis of cervical cancer could not be confirmed. Thus, information for these women was not obtained. The review of paper-based and electronic medical records provided 1,915 records of women newly diagnosed with invasive cervical cancer from 2010 to 2013, 806 women from KATH and 1,109 women from KBTH (Figure 1).

Of the 806 women with invasive cervical cancer recorded at KATH, 83 were found to have records at both the Department of Obstetrics and Gynecology and the Oncology Unit. For these women, the records of the Oncology Unit were used as they were more complete. Forty-three women recorded in the Oncology Unit electronic records at KATH did not appear to have invasive cervical cancer after review of the paper-based records. Of these women, the diagnosis of 13 was cancer of the ovary, 10 cancer of the endometrium, 8 cancer of the vulva, 7 cancer of the uterus and 2 had other diagnoses.

Out of 1,109 women with invasive cervical cancer recorded at KBTH, 61 women did not have the diagnosis confirmed after review of paper-based medical records. For 19 the diagnosis was cancer of the ovary, 18 cancer of the endometrium, 16 cancer of the vulva and 18 had other diagnoses. Three women at KBTH had records at both the Department of Obstetrics and Gynecology and the Oncology Unit, so the records from the Oncology Unit were used. After exclusion of records indicating a diagnosis that was not cervical cancer and duplicates, the records of 1,725 women with invasive cervical cancer were identified.

For 359 (20.8%) women no telephone number was available (data not shown). Among those with a telephone number, further information was obtained for 829 (48.1%) women. Access to the telephone was not often available where clinical staff did not specifically ask for a contact telephone number.

Table 1 shows the proportion of women with early and late stage of disease at presentation in relation to other factors. Younger women were more likely to be diagnosed with FIGO stage I-II disease compared with older women but the result did not achieve statistical significance (p=0.352). Women who resided in a metropolis were more likely to be diagnosed with FIGO stage III-IV disease (p=0.034). Additionally, women with no past medical history (p=0.652) and comorbidity (p=0.328) were more likely to be diagnosed with FIGO stage III-IV disease compared with those with any past medical history or comorbidity. Having comorbidities like hypertension and renal disease increase the risk of being diagnosed with FIGO stage III-IV disease (p<0.001).

About 1.1% of women had been screened (not part of the diagnostic process) before invasive cervical cancer

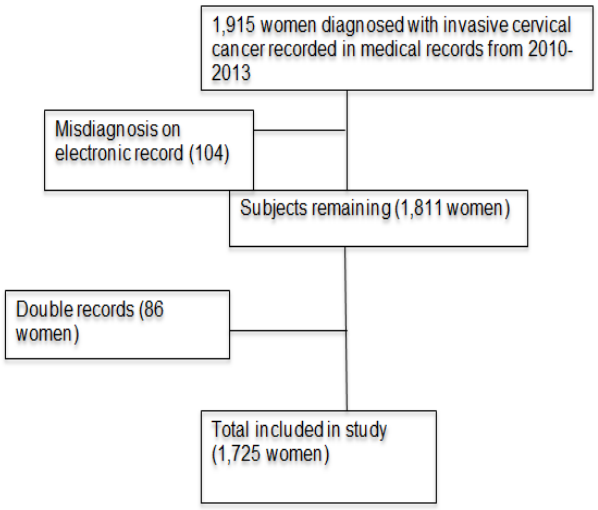

Figure 1. Flow Chart of Women Included

Table 1. Proportion of Women with Early and Late Stage of Disease at Presentation in Relation to Other Factors

Characteristic	FIGO stage at presentation I-II		III-IV		Total	
Age group (years)						
≤29	5	1	11	1.4	16	1.2
30-39	40	7.7	71	9	111	8.5
40-49	96	18.6	165	20.8	261	19.9
50-59	152	29.4	196	24.7	348	26.6
≥60	224	43.3	350	44.1	574	43.8
Chi-square						p=0.352
Region of residence						
Metropolis	278	53.8	407	51.7	685	52.5
Urban	153	29.6	254	32.2	407	31.2
Semi-urban	45	8.7	90	11.4	135	10.3
Non-Ghana residents	41	7.9	37	4.7	78	6
Chi-square						p=0.034
Formal education						
Tertiary	20	7.3	21	5.5	41	6.2
High school	101	36.6	103	26.8	204	30.9
Primary	42	15.2	63	16.4	105	15.9
None	113	40.9	197	51.3	310	47
Chi-square						p=0.022
Parity 1						
0-2	71	14	114	14.8	185	14.5
3-5	187	36.9	264	34.3	451	35.3
6-8	173	34.2	276	35.8	449	35.2
9-11	59	11.7	105	13.7	164	12.9
12-15	16	3.2	10	1.3	26	2
16-20	0	0	1	0.1	1	0.1
Fisher's exact						p= 0.159
Parity 2						
0-2	71	14	114	14.7	185	14.5
3-4	119	23.5	173	22.4	292	22.8
5+	316	62.5	486	62.9	802	62.7
Chi-square						p=0.865
Parity 3						
0-3	127	25.1	202	26.2	329	25.8
4-6	187	37	281	36.5	468	36.7
7+	192	37.9	287	37.3	479	37.5
Chi-square						p=0.902
Medical history						
No	487	94.4	738	93.8	1,225	94
Yes	29	5.6	49	6.2	78	6
Chi-square						p=0.652
Comorbidity count						
None	296	57.4	460	58.4	756	57.9
1 other disease	178	34.5	253	32.1	431	33.1
2 other diseases	39	7.5	62	7.9	101	7.8
3 and more diseases	3	0.6	13	1.6	16	1.2
Fisher's exact						p=0.328

Table 1. Continued

Characteristic	FIGO stage at presentation I-II		III-IV		Total	
Major diseases[a]						
Hypertension	129	64.5	144	53.5	273	58.2
Diabetes	39	19.5	39	14.5	78	16.6
Respiratory diseases	11	5.5	19	7.1	30	6.4
Renal disease	5	2.5	34	12.6	39	8.3
HIV	10	5	12	4.5	22	4.7
Malaria	1	0.5	6	2.2	7	1.5
Gastrointestinal disease	5	2.5	15	5.6	20	4.3
Fisher's exact						p<0.001

Parity 1, women whose parity was labeled as 5 or more and 7 or more in medical records coded as missing; parity 2, parity 5 or more coded as missing; parity 3, parity 5 or more and 7 or more included in the analysis; [a]; Columns do not add up to 100% as some women had more than one comorbidity.

diagnosis. The majority of women had at least two diagnostic investigations (75.0%) (Table 2). The most common investigation undertaken was a cervical biopsy, performed for 95.5% of women who had diagnostic investigations. The use of imaging tests such as computed tomography (CT scan), magnetic resonance imaging (MRI) or colposcopy was uncommon. However, other investigations such as abdominal ultrasound, X-ray, liver function tests, urine analysis, full blood count and other blood tests were frequently done (data not shown).

Table 3 shows the FIGO stage of disease at presentation in relation to other factors. No statistically significant associations between localized (FIGO stage I-II) or more advanced disease (FIGO stage III-IV) and parity, occupation, formal education and ethnicity were found although women of Ga/Adangbe ethnicity tended to be more likely to present with advanced disease than other ethnic groups. Living in a semi-urban region was

Table 2. Diagnostic Investigations

Characteristic	Number (1,725)	%
Investigation count		
None	74	4.3
1 investigation	142	8.2
2 investigations	1,294	75
3 or more investigations	56	3.3
Missing	159	9.2
Investigation [a]		
Cervical screening	17	1.1
Biopsy	1,425	95.5
Colposcopy	3	0.2
CT scan	44	3
MRI	5	0.3
Other	1,404	94.1

The majority of women have three or more other investigations which has not indicated in the number as all other investigations were categorized as "other". This includes full blood count, abdominopelvic ultrasound, chest X ray; [a]Columns do not add up to 100% as some women have more than one investigation

Table 3. Logistic Regression of Stage at Presentation in Relation to Other Factors

Characteristic	Stage I-II		Stage III-IV				
	Number (518)	%	Number (793)	%	Odd ratio*	95% CI	p-value
Age group (years)							
≤29	5	1	11	1.4	1	reference	
30-39	40	7.7	71	9	3.3	1.3-8.1	0.01
40-49	96	18.6	165	20.8	1.6	0.9-2.7	0.102
50-59	152	29.4	196	24.7	1.5	0.9-2.4	0.124
≥60[a]	224	43.3	350	44.1			
Region of residence							
Metropolis	278	53.8	407	51.7	1	reference	
Urban	153	29.6	254	32.2	1.3	0.9-1.9	0.221
Semi-urban	45	8.7	90	11.4	1.6	0.9-3.1	0.143
Non-Ghana residents	41	7.9	37	4.7	0.8	0.1-11.0	0.851
Parity							
0-2	71	14	114	14.7	1	reference	
3-4	119	23.5	173	22.4	1	0.6-1.9	0.925
5+	316	62.5	486	62.9	1.2	0.7-2.1	0.537
Occupation							
Teacher/businesswoman	15	3.8	11	1.8	1	reference	
Trader/farmer	327	83.4	550	90	2.7	0.6-11.5	0.176
Seamstress/hairdresser	14	3.6	20	3.3	1.4	0.2-8.3	0.739
Other	36	9.2	30	4.9	1.7	0.4-7.1	0.479
Formal education							
Tertiary	101	36.6	103	26.8	1	reference	
High school	20	7.3	21	5.5	0.5	0.2-1.4	0.173
Primary	42	15.2	63	16.4	0.7	0.3-2.1	0.552
None	113	40.9	197	51.3	1.1	0.4-3.0	0.877
Marital status							
Single	65	13.1	101	13.4	1	reference	
Married	266	53.6	368	48.7	1.1	0.6-1.9	0.778
Other	165	33.3	287	37.9	1.7	0.9-3.2	0.08
Ethnicity							
Ga/Adangbe	54	11.2	67	9.3	1	reference	
Ewe	52	10.8	78	10.8	1.9	0.9-4.1	0.092
Akan	288	59.8	454	62.8	1.8	1.0-3.4	0.068
Non-Ghana ethnicitya	42	8.7	38	5.3			
Other Ghanaian ethnicity	46	9.5	86	11.8	2	0.9-4.7	0.091

* Adjusted for all factors in the table; [a] Omitted because of collinearity with others

associated with a greater risk (OR: 1.6; 95% CI: 0.9-3.1) of having stage III-IV compared with stage I-II disease. More cases were diagnosed at advanced stages than localized disease, however, women aged 30-39 years were more likely to be diagnosed with localized disease (OR: 3.3; 95% CI: 1.3-8.1) after adjustment for region of residence, parity, occupation, education, marital status and ethnicity. None of the women aged 30-39 years were diagnosed by screening.

A summary of the treatment women received and their pattern of clinical follow-up after the first consultation is shown in Table 4. Treatment with radiation was received by 55.4% of women. Of those who had radiotherapy, the majority of women received both external beam radiation and brachytherapy (53.0%). Just 7.5% of women offered chemotherapy did not receive it. Among women who were offered chemotherapy but did not receive it (29 women), 2 died before treatment was given, one defaulted treatment and another was unable to pay for the treatment (data not shown).

Sixty-one percent (61%) of women with cervical cancer attended at least one clinical follow-up appointment. There was no clinical follow-up information for most of the women whose diagnosis was obtained from the electronic database and paper-based records at the Department of Obstetrics and Gynecology at KBTH. Over

Table 4. Oncology Treatment and Follow-up Information from Medical Records

Characteristic	Number (1,725)	%
Received radiotherapy		
No	567	32.9
Yes	955	55.4
Missing	203	11.7
Type of radiotherapy*		
External beam only	436	45.7
Brachytherapy only	5	0.5
Both	506	53
Missing	8	0.8
Offered chemotherapy		
No	1,132	65.6
Yes	387	22.4
Missing	206	12
Received chemotherapy**		
No	29	7.5
Yes	352	91
Missing	6	1.5
At least one clinical follow-up attendance		
No	463	26.8
Yes	1,055	61.2
Unknown	207	12
Follow-up investigation§		
No	282	26.7
Yes	768	72.8
Unknown	5	0.5
Investigations[a]		
CT scan	50	6.5
MRI	1	0.1
Vaginal vault smear	6	0.8
Other investigations	757	98.6
Recurrence		
No	1,511	87.6
Yes	55	3.2
Unknown	159	9.2
New metastases		
No	1,499	86.9
Yes	67	3.9
Unknown	159	9.2
Status (whether women were alive or dead)		
Dead	128	7.4
Unknown	1,597	92.6
Status (from telephone interview)[b]		
Dead	502	29.1
Alive	327	19
Missing	896	51.9
Follow-up (women alive)[b]		
No	55	16.8
Yes	249	76.2
Unstated	23	7

[a]; Columns do not add up to 100% as some women received more than one investigation; [b]; Patients status obtained by telephone enquiry; *, Only those who received radiotherapy; **Only those who received chemotherapy; §; Only those who had at least one clinical follow-up attendance.

72% of women that had clinical follow-up had further investigations. This was mostly for the investigation of metastases and recurrence. Most women who had clinical follow-up had abdominopelvic ultrasound, x-ray, blood or urine analysis. Among all women with cervical cancer, 3.2% had a recurrence and new metastases diagnosed during clinical follow-up. The most common metastatic sites were the liver or lungs (data not shown). Other metastases occurred in the kidney, bladder, bones, brain and ovaries, with regional spread common for some of these sites. Some patients also suffered recurrence in the pelvic wall, bladder, rectum and lymph nodes.

Among women with cervical cancer for whom further information was sought by telephone, 502 (29.1%) women were dead when contact was sought (Table 4). Among women alive, 76.2% were still undergoing medical review at various hospitals (including KATH and KBTH) at the time of telephone interview. Overall, 561 deaths occurred and 324 women were alive at the end of data collection (data not shown). This number included women for whom status (128 deaths) was documented in the medical record. Sixty-nine deaths documented in medical records were also confirmed by telephone interview with relatives. Among deaths recorded in the medical records, the principal cause of death was not documented for 97.7%. Deep vein thrombosis, cervical cancer and uraemia due to metastatic cervical cancer were the common causes of death for those for whom a cause of death was listed (data not shown).

Discussion

This is the first study conducted in Ghana to describe the basic features, methods of diagnosis and treatment received for women diagnosed with invasive cervical cancer. The increased risk of advanced disease in women aged 30-39 years may be attributed to individuals associating cervical cancer to older women. Thus, they may not initially associate their signs and symptoms to invasive cervical cancer and likely to be diagnosed at late state of presentation.

Women with invasive cervical cancer had high parity in this study. This is consistent with other studies conducted in Ghana (Nkyekyer, 2000) and elsewhere (Hammouda et al., 2005; Munoz et al., 2002; Franceschi et al., 2003). Although parity has begun to decline in Ghana, it is still very high compared with high-income countries (Ghana Statistical Service, 2013). In most rural and a few peri-urban areas in Ghana, a high number of children serve as social security in old age for parents. That is, the higher the number of children a couple has, the higher likelihood that some may survive to provide for their parents in the future. Considering that most women diagnosed with invasive cervical cancer were from rural areas, this might account for the high parity in the study. Most women did not have significant past medical history or comorbidities. However, women may have under-reported their past medical history as the majority of clinicians rely on patient recall in Ghana if it is not recorded in the medical records.

Like other sub-Saharan countries, pre-treatment assessment is usually sub-optimal. Investigations like

cystoscopy, sigmoidoscopy, intravenous urogram, MRI and CT scan which are cardinal in the management of gynecologic oncology patients were often not done. Less than 10% of women had an MRI or CT scan performed as part of their diagnostic assessment. Similar findings have been reported in Kenya (Maranga et al., 2013). Institutions relied on FIGO staging which is clinical, and therefore seldomly performed imaging for staging except for intravenous pyelogram and chest X-ray. Abdominal ultrasound was often used to investigate the presence of hydronephrosis as part of clinical assessment. Although clinical examination has been reported to be as good as MRI for the accurate assessment of early stage disease, it is not as effective for advanced disease (Engin et al., 2011).

Despite the availability of MRI and CT scanners in the centers that treat cervical cancer, they were hardly used. Positron emission tomography (PET) is unavailable in Ghana. Together, or individually, MRI, CT scan and PET may increase the sensitivity and specificity of the detection of lymph node and pelvic wall spread but have not been incorporated into the FIGO system of staging. Examination under anesthesia including cystoscopy and proctoscopy was done only in a limited number of cases, and pain and discomfort is likely to reduce accurate staging of the disease. Therefore the extent of existing disease is likely to be under-reported. As most cervical cancer was diagnosed at an advanced stage, most women were likely to have had more advanced disease at diagnosis than that indicated in their medical record (Nartey et al., 2017).

Some of the women defaulted treatment after first assessment. For women to receive either radiotherapy alone or chemoradiation, they must progress through a series of steps, including referral to the Oncology Unit, booking for consultation (which varied depending on the urgency of the case), consultation, request for laboratory tests after consultation, review by an oncologist, simulations or mark-up for radiotherapy, consent for treatment and receipt of treatment. Although Ghana has a national health insurance scheme, out-of-pocket payment constitutes a major part of the hospital payment system. Insured patients may still be required to pay a significant part of their hospital treatment (Akazili et al., 2014). Patients may have to pay to receive both radiotherapy and chemotherapy. Thus, it is plausible that some women who did not receive treatment were unable to pay. Additionally, distance to the two oncology centers may influence whether treatment is received. Public hospitals are spread throughout Ghana and vary from large urban facilities with several beds to small rural health centers and health posts but only the two public hospitals that contributed patients for the study had cancer treatment units.

Although the majority of women with cervical cancer in this study lived in the Greater Accra and Ashanti regions, most were from rural areas. They were first likely to access care through rural health facilities which are often under-resourced. Women who required radiotherapy alone or chemoradiation are referred to the two public oncology units in the country. Transportation to these two hospitals is costly and patients may have to arrange for accommodation if they do not have a relative living near Accra or Kumasi. A woman's belief about disease causation may also influence her health seeking behavior. The majority of Ghanaians attribute disease causation to spiritual causes and may therefore resort to alternative and complementary medicine for treatment rather than orthodox medicine that includes surgery, radiotherapy and chemotherapy (Yarney et al. 2013). The frequency and extent of the side effects of orthodox medicine are exaggerated in the media and internet with the best chances of cure commonly attributed to spiritual intervention.

The majority of women who received radiotherapy had both external beam radiation and brachytherapy. The actual and optimum radiotherapy utilization rates in Ghana have been estimated to be 9% and 51%, respectively (Rosenblatt et al., 2015). External beam therapy alone is recommended for some women who require palliative treatment. Considering that the majority of women with invasive cervical cancer in this study were diagnosed with advanced cancer, we expect many women received treatment with palliative rather than curative intent.

Limitations of the study included the incomplete perspective obtainable from medical notes due to the informal and abbreviated way they were often written. Hospital records were sometimes incomplete and information about potential factors of interest were not consistently available. Medical folders of gynecological patients at the Department of Obstetrics and Gynecology at KBTH were not kept in the hospital. Almost all patients took their medical folders home and returned with them at each subsequent visit. Only a few gynecological patient folders were kept in the department. These folders were for patients who forgot to pick them up after admission or who had died in hospital. The electronic database recorded some basic information (mainly descriptive) such as name, age, parity, residence, diagnosis, death and some information on the treatment received. There were a lot of data fields that required entry in the electronic record. However, only a few of these were fully used. Some records did not list the diagnosis. Therefore, it was initially difficult to know which women had cervical cancer and whether cervical cancer was correctly recorded without examining the entire record. Checking through the medical folders at the department increased completeness as for some women the folders missing a diagnosis in the electronic records were left in the department. Additionally, some cases missing a diagnosis in the electronic records at the Department of Obstetrics and Gynecology were abstracted from the Oncology Unit files, as most women were referred to the Oncology Unit for treatment. The diagnosis for some women recorded in the electronic record at the two hospitals could not be confirmed after review of paper-based medical records. This suggests that the annual reports of the two hospitals are likely to under-report the number of different cancers treated. For instance, only 183 women with cervical cancer were reported by the Oncology Unit at KBTH in the 2013 annual report (Korle Bu Teaching Hospital, 2013) yet 1,105 were found in this study.

There were difficulties interviewing some patients and relatives by telephone. The telephone numbers listed for some women were no longer correct and these patients were not traceable. Other telephone numbers were no

longer in use. Additionally, some women did not have telephone numbers. A few patients and relatives were not willing to provide the information sought. This was more common when the patient had died and a relative was contacted. However, during the telephone interviews with patients and relatives, their views about the hospital care received were expressed. In particular, it was found that patients and relatives would prefer periodic follow-up by hospital staff. We were not able to examine how long women were followed-up by clinical services.

In conclusion, there is scope for a more systematic assessment and treatment for patients with cervical cancer in Ghana. Improving access to health care is important to improve the mortality and survival rates from invasive cervical cancer. Additionally, the monitoring of treatment and outcomes will provide information to improve health services. Improvements in data quality will enable more complete assessment of cervical cancer presentation and management for the development of treatment guidelines and the monitoring of improvements in cervical cancer control.

Abbreviations

- CT: Computed Tomography
- FIGO: International Federation of Gynecology and Obstetrics
- KATH: Komfo Anokye Teaching Hospital
- KBTH: Korle-Bu Teaching Hospital
- MRI: Magnetic Resonance Imaging
- PET: Positron Emission Tomography

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Final approval of manuscript: All authors

Conflict of interest

The authors have no conflict of interest to disclose.

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