Association between stage at diagnosis and knowledge on cervical cancer among patients in a Kenyan tertiary hospital: a cross-sectional study

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Abstract

Introduction: In Kenya, cervical cancer is the second most common cancer among women; almost half of all women with invasive cervical cancer are diagnosed at a late stage. Few women are aware of the symptoms and risk factors of cervical cancer and that its precursor lesions are detectable through screening thus most women seek treatment when the cancer is at an advanced stage. The study explored the influence of cervical cancer awareness on stage at diagnosis in patients attending Kenyatta National Hospital.

Methods: A cross-sectional survey was adapted to obtain socio-demographic information, knowledge on symptoms and risk factors from 361 women with histological diagnosis of cervical cancer conveniently sampled at Kenyatta National Hospital. Associations between stage at diagnosis and knowledge on cervical cancer were tested using chi-square statistic and Fisher’s exact test at 95% confidence interval.

Results: Seven in every 10 women (72.6%) presented with advanced stage cervical cancer. Knowledge on the sexually transmitted nature of cervical cancer was inadequate, 22% of women with early stage and 23.7% of women with advanced stage cervical cancer (p=0.874). Majority of the women were not aware of the causative link between cervical cancer and human papillomavirus (HPV), 8 (13.1%) of women with early stage and 5 (3.5%) of women with advanced stage cervical cancer (p=0.036).

Conclusion: Stage at presentation was advanced and knowledge on the role of a sexually transmitted virus in the cervical cancer aetiology was poor among the women. Increasing screening programs and providing information highlighting this association is necessary.
Introduction

Cervical cancer is the third most frequently diagnosed cancer and the fourth leading cause of cancer deaths among women with approximately 529,800 new cancer cases and 275,100 cancer deaths occurring in women worldwide. Close to 86% of these new cases and deaths occur in developing countries [1]. Sub-Saharan Africa has a disproportionately enormous burden of cervical cancer which is mostly due to scarce screening programs that allow for early detection of precancerous lesions and early stage cervical cancer [2]. In Kenya, cervical cancer is the second most prevalent cancer after breast cancer [3]. The World Health Organisation (WHO) estimates that approximately 4802 women were diagnosed with cervical cancer in 2012 with about 2451 of the incident cases dying of the disease [4]. The major underlying cause of cervical cancer is human papillomavirus (HPV) infection and its precursor lesions [5]. Smoking has been found to be an independent risk factor for cervical cancer after altering the effects of HPV infection [6]. Other risk factors for cervical cancer include having many sexual partners, high parity, early age at first intercourse, co-infection with human immunodeficiency virus (HIV) and long term use of oral contraceptives [7]. Early detection of cancer is vital due to the documented relationship between stage at diagnosis and survival. Prevention amenities such as information on cervical cancer, screening services, vaccination against HPV, the causes of and treatment of pre-cancerous lesions are all vital in treating cervical cancer at its early stage [8]. Abridging cancer time of diagnosis is dependent on a patient presenting to a healthcare facility with probable cancer symptoms commonly referred to as patient delay, on primary healthcare providers reacting aptly to the symptoms, by either setting up additional investigations and or referring them to a specialist also known as doctor or practitioner delay and by minimising the interval between referral and diagnosis, referred to as hospital or system delay. However, patient delay is known to play a major role in most delays [9, 10]. Low levels of education make it difficult for the patients to understand the implications of the disease and to take note of the common symptoms. In African countries, approximately 95% of cancer patients are diagnosed with late stage or end stage disease. Culture, low level of cancer knowledge in the population, lack of specialized health care practitioners and limited access to health care facilities contribute to the delay in diagnosis for cancer patients [11, 12]. Similarly, poor implementation of cervical cancer screening programs is a likely cause of few women being screened in health facilities with the basic infrastructure and facilities for cervical cancer screening in the east, central and southern African countries (ECSA) [13]. Women at risk of developing cervical cancer require accurate information for them to understand prevention methods and to prompt them to use screening services. Although a few women might have knowledge on the disease, fear of the procedure, embarrassment concerning pelvic examination, family pressures, or fear of cancer may prevent them from seeking healthcare services [14]. This study aimed to establish the association between stage at diagnosis and knowledge on cervical cancer among women attending Kenyatta National Hospital (KNH).

Methods

Study design and study population: a cross-sectional study was carried out on patients with cervical cancer attending KNH, a national referral hospital and primary teaching hospital for the school of medicine, University of Nairobi (UoN). This study focused on women above the age of 18 years with a histological diagnosis of cancer receiving treatment at the cancer treatment centre (CTC), radiotherapy department and the obstetrics and gynaecology department. Patients who were critically unwell thus unable to respond to questions, those in documented remission of cancer and those who were unwilling to take part in the study were excluded. The stage at presentation of cervical cancer based on histological diagnosis was abstracted from clinical records of patients. A total of 385 women attending the clinics were selected through convenience sampling after written informed consent was obtained during the period of May to July 2015; 24 women were excluded from the study as their clinical records did not have staging information. Overall, 361 out of the 385 eligible women were recruited.

Data collection: a semi-structured questionnaire was administered with the help of a trained research assistant who conducted face-to-face interviews. The questionnaire contained detailed questions concerning socio-demographic information such as age, marital status, age at marriage, parity, education level and partners’ education level, occupation and total household income. Knowledge on cervical cancer risk factors; HPV, smoking and contraceptive use and symptoms such as vaginal bleeding between periods, bleeding after sex, vaginal discharge and bleeding after menopause were assessed. The study was approved by the Kenyatta National Hospital/University of Nairobi ethics and review committee (KNH/UON-ERC) as well as by the Institutional Research and Ethics Committee at Moi University College of Health Sciences (MUCHS-IREC).

Data analysis: the main outcome variable, stage at diagnosis, was determined using the International Federation of Gynaecology and Obstetrics (FIGO) staging system. For these analyses, stage at presentation was grouped as early (IA1, IA2, IB1 and IIA) or advanced (IIB, IIIA, IIIB, IVA and IVB) or advanced (IIB, IIIA, IIIB, IVA and IVB). Stage at presentation was noted as the stage that a clinician reported at first diagnosis of malignancy. Data analysis was performed using the Statistical Analysis System, ver. 9 (SAS Inc., North Carolina, USA) and statistical significance was set at p ≤ 0.05. Statistical associations between stage at diagnosis and knowledge on cervical cancer were tested using chi-square statistic and fisher’s exact test at 95% confidence interval.

Results

The socio-demographic characteristics of the population (n=361) are shown in Table 1.

| Variable | No. of cases (n=361) % |
|----------|------------------------|
| Age in years |                        |
| <40 | 77 | 21.4 |
| 41-50 | 123 | 34.2 |
| 51-60 | 106 | 29.4 |
| ≥61 | 54 | 15 |
| Age at marriage |                |
| 15-20yrs | 21 | 6.7 |
| 21-25 yrs | 109 | 34.7 |
| ≥26yrs | 32 | 10.2 |
| Marital status |        |
| Single | 48 | 13.4 |
| Married | 221 | 61.7 |
| Divorced | 25 | 7 |
| Widowed | 64 | 17.9 |
| Parity |                      |
| 0-3 | 146 | 40.6 |
| 4-7 | 175 | 48.6 |
| ≥8 | 39 | 10.8 |
| Education level |        |
| No formal education | 37 | 10.3 |
| Primary education | 198 | 55 |
| Secondary education | 112 | 31.1 |
| Tertiary education | 11 | 3.1 |
| University education | 2 | 0.6 |
| Partner’s education level |    |
| No formal education | 10 | 4.5 |
| Primary education | 93 | 42.1 |
| Secondary education | 103 | 46.6 |
| Tertiary education | 14 | 6 |
| University education | 1 | 0.5 |
| Occupation |            |
| Permanently employed | 20 | 5.5 |
| Casually employed (hairdresser/ house girl) | 35 | 9.7 |
| Unemployed (house wife/student) | 69 | 19.1 |
| Self-employed (farmer/business) | 237 | 65.7 |
| Stage at diagnosis |        |
| Early | 99 | 27.4 |
| Late | 262 | 72.6 |

The mean age of patients was 49 years (range, 42-57 years) and the mean age at marriage was 20 years (range, 18-23 years). Majority of the women were multiparous with 48.6% having between 4 and 7 children. The number of women diagnosed with advanced stage cervical cancer was higher than those diagnosed at an early stage (72.6% vs 27.4).
Table 2: Differences in knowledge on risk factors for cervical cancer and stage at presentation

|                        | Early Stage | Advanced Stage | p value |
|------------------------|-------------|----------------|---------|
| Number of patients     | (n=99)      | (n=262)        |         |
| Have you ever heard of cervical cancer?† |             |                | 0.226   |
| Yes                    | 62          | 145            |         |
| No                     | 37          | 116            |         |
| Causes of cervical cancer† |             |                | 0.036   |
| Human immunodeficiency virus (HIV) | 1            | 2              |         |
| Human papillomavirus (HPV) | 8            | 13             |         |
| I don't know            | 52          | 85.2           |         |
| What to learn about cervical cancer?‡ |             |                |         |
| From neighbours         | 15          | 24.6           | 0.163   |
| Through the radio       | 28          | 45.9           |         |
| Through the television  | 11          | 18.1           |         |
| From the newspaper      | 3           | 4.9            |         |
| Through education       | 32          | 52.5           |         |
| Causes of abnormal vaginal bleeding‡ |             |                | 0.625   |
| Infection               | 42          | 42.4           |         |
| Cancer                  | 13          | 13.1           |         |
| Other                   | 43          | 43.4           |         |
| What causes bleeding after sex‡ |             |                | 0.537   |
| Infection               | 48          | 48.4           |         |
| Cancer                  | 11          | 11.2           |         |
| Other                   | 30          | 30.6           |         |
| What causes vaginal discharge‡ |             |                | 0.04    |
| Infection               | 67          | 67.7           |         |
| Cancer                  | 7           | 7.1            |         |
| Other                   | 30          | 30.6           |         |
| What causes bleeding after menopause‡ |             |                | 0.166   |
| Infection               | 58          | 58.2           |         |
| Cancer                  | 16          | 16.3           |         |
| Other                   | 23          | 23.5           |         |

§ Numbers may not add up to total because of missing data.
† Indicates a multiple response question numbers may not add up to total.
‡ Indicates skipping patterns in the questionnaire, numbers may not add up to total.

Table 3: Knowledge on infectious and non-infectious risk factors and stage at presentation

|                         | Early Stage | Advanced Stage | p Value |
|-------------------------|-------------|----------------|---------|
| Number of patients      | (n=99)      | (n=262)        |         |
| Have you ever had genital warts?§ |             |                | 0.038   |
| Yes                     | 23          | 23.2           |         |
| No                      | 76          | 76.8           |         |
| Tobacco use†            |             |                | 0.526   |
| Never                   | 23          | 23.2           |         |
| Former                  | 30          | 30.6           |         |
| Current                 | 46          | 46.5           |         |
| What to go to gynaecological examinations help with?† |             |                | 0.137   |
| Early detection of cancer of the cervix | 68          | 68.7           |         |
| To detect 5%            | 14          | 14.1           |         |
| Others                  | 18          | 18.2           |         |
| What is a pap smear test?‡ |             |                | 0.024   |
| A Pap smear test to detect the presence of cancer cells | 73          | 73.5           |         |
| I don't know            | 24          | 24.7           |         |
| Cervical cancer sexually transmitted‡ |             |                | 0.874   |
| Yes                     | 22          | 22.4           |         |
| No                      | 30          | 30.5           |         |
| I don't know            | 46          | 46.5           |         |
| What other risk factor?‡ |             |                | 0.216   |
| Yes                     | 46          | 46.5           |         |
| No                      | 39          | 39.4           |         |
| Hormonal contraceptives use† |             |                | 0.953   |
| Yes                     | 72          | 72.7           |         |
| No                      | 27          | 27.3           |         |
| Duration of contraceptive use categories† |             |                |         |
| 1-3 yr                  | 9           | 9.1            |         |
| 4-6 yr                  | 11          | 11.1           |         |
| 7-9 yr                  | 22          | 22.4           |         |
| 10 yr                   | 22          | 22.4           |         |
| I don't know            | 35          | 35.3           |         |

§ Numbers may not add up to total because of missing data.
† Indicates a multiple response question numbers may not add up to total.
‡ Indicates skipping patterns in the questionnaire, numbers may not add up to total.
Conclusion

This study revealed that stage at presentation among women attending Kenyatta national hospital was considerably advanced. Knowledge on cervical cancer symptoms, on the link between HPV and cervical cancer and on the sexually transmitted nature of cervical cancer was limited. There is therefore need to increase screening programs and health education programs that will highlight these linkages.

What is known about this topic

- Low levels of education, lack of knowledge and poverty are associated with inadequate preventive cervical cancer screening practices. Cervical cancer can be prevented if precancerous lesions are detected early through screening. Screening for cervical cancer only takes place in fragmented projects due to poorly revised national policy guidelines, scarce alternatives for diagnosis and treatment at secondary levels of care and ineffective monitoring and evaluation systems for ongoing projects;
- Lack of adequate knowledge on cervical cancer is not only limited to patients, healthcare workers may also be ill informed about the disease resulting in missed screening opportunities and delays in patient referrals to tertiary institutions;
- Infection with HPV is essential for the development of cervical cancer and is transmitted mainly through sexual contact. Infection with HPV is greatly increased in individuals who have multiple sexual partners, those who had early sexual debut and those who are co-infected with other sexually transmitted diseases such as herpes simplex virus, Chlamydia trachomatis. Vaccination against HPV provides immunity against about 70% of the strains that cause cervical cancer. This vaccine however is not available as part of the national vaccine and immunization program.

What this study adds

- This study shows that the level of awareness of the causal link between HPV and cervical cancer in women presenting with early and advanced stage cancer is low;
- The study also demonstrates that women who were diagnosed with early stage disease also had inadequate knowledge of the rudimentary symptoms of cervical cancer and that public knowledge regarding the disease was low in these women;
- The study further demonstrated that only a small percentage of the women were aware of the sexually transmitted nature of cervical cancer.

Competing interests

The authors declare no competing interest.

Authors’ contributions

Kabura Wamburu, Josephat Ngengo and Naftali Busakhala were involved in the study design with the statistical analysis carried out by Kevin Owour. Kabura Wamburu drafted the manuscript to which all authors subsequently contributed. All authors have read and agreed to the final manuscript.

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