Knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital, Nairobi, Kenya

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Abstract. Gichangi P, Estambale B, Bwayo J, Rogo K, Ojwang S, Opiyo A, Temmerman M. Knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital, Nairobi, Kenya. *Int J Gynecol Cancer* 2003;**13**:827–833.

Invasive cervical cancer (ICC) is the leading cause of cancer-related death among women in developing countries. Population-based cytologic screening and early treatment does reduce morbidity and mortality associated with cervical cancer. Some of the factors related to the success of such a program include awareness about cervical cancer and its screening. The objective of this study was to assess knowledge and practice about cervical cancer and Pap smear testing among cervical cancer and noncancer patients using a structured questionnaire to obtain information. Fifty-one percent of the respondents were aware of cervical cancer while 32% knew about Pap smear testing. There were no significant differences in knowledge between cervical cancer and noncancer patients. Health care providers were the principal source of information about Pap testing (82%). Only 22% of all patients had had a Pap smear test in the past. Patients aware of cervical cancer were more likely to have had a Pap smear test in the past. The level of knowledge is low among ICC and noncancer patients. There is need to increase the level of knowledge and awareness about ICC and screening among Kenyan women to increase uptake of the currently available hospital screening facilities.

KEYWORDS: cervical cancer, knowledge, Pap testing.

Cervical cancer is one of the leading causes of morbidity and mortality among women in developing countries[1–3]. In countries where Papanicolaou (Pap) smear testing covers a wide population, both the incidence and prevalence of cervical cancer has been dramatically reduced[4,5] Although there is overwhelming evidence that cervical cancer today is almost totally preventable to a large extent through screening and treatment of premalignant lesions, the service is unfortunately not readily available to the general population in most developing countries, including Kenya[6,7]

Most developing countries have declined to initiate cytologic screening programs on account of cost. Indeed, the cost of setting up population-based

screening programs is initially prohibitive. In the long run, however, screening and treatment for precancerous lesions is a more cost-effective intervention compared to management of invasive cervical cancer. In 1993, the World Bank estimated that the cost of screening woman every 5 years was USD100 per disability-adjusted life year (DALY) gained compared with USD2600 per DALY for treatment/palliative care of invasive cervical cancer[8]. Other bottlenecks to effective Pap smear testing include limited or poor quality of cytology services, poor follow-up or inavailability of diagnostic and treatment services for women with dysplasia, lack of awareness about cervical cancer screening, inappropriate beliefs, and misconceptions[9–12].

At personal level, the decision by an asymptomatic person to undergo a timely preventive or screening test depends on whether that person believes in the feasibility and usefulness of the measure, perceived susceptibility, severity, barriers, benefits of action, and whether there is clear understanding of the problem against which the test is directed[13,14]. Awareness about cervical cancer could also improve willingness to utilize screening services, early presentation[15] and compliance with treatment and follow-up protocols[16].

The estimated incidence of cervical cancer in Kenya is between 37 and 47 per 100,000 women[3]. As noted above, there is no population-based cervical screening program in Kenya currently. Thus most cervical cancer cases in Kenya present with advanced disease, which is not suitable for surgical treatment. Less than 10% of cervical cancer cases in Kenya are in stage I-IIA at time of presentation[6]. This study which is part of a larger study examining the relationship of invasive cervical cancer and HIV infection was intended to provide insight into the practice of preventive behavior (Pap testing) among women accessing hospital facilities. The findings of this study will be a guide in the development of strategies that will strengthen cervical cytologic screening in Kenya. It is hoped that the Ministry of Health will incorporate these findings in its policy when developing national population-based cervical cancer screening/prevention programs.

Materials and methods

This cross-sectional study was conducted at Kenyatta National Hospital (KNH) Radiotherapy and Obstetrics/Gynecology Departments. KNH is a teaching and referral hospital with a 2000 bed capacity. The Departments of Obstetrics and Gynecology and Radiotherapy form the largest center treating invasive cervical cancer (ICC) in Kenya. From January 2000 to April 2002, ICC patients attending radiotherapy clinic or ICC patients admitted in the hospital and a randomly selected group of noncancer patients (in- and outpatients) from the Obstetrics and Gynecology Department were requested to participate in the study. Non-cancer patients were selected from the admission register and outpatient clinic register. For inpatients, the first five admissions of the previous day were interviewed while for outpatients, the first five patients to be registered in the clinic were interviewed.

A structured questionnaire with questions on sociodemographic characteristics, knowledge about cervical cancer, Pap smear testing, previous screening history, personal perception of risk of developing cervical cancer, and source of information about the Pap test was administered by trained research nurses as a one to one interview. The questionnaires was administered in English (universal medium of teaching and communication in Kenya), and Kiswahili (national language). For illiterate patients, a local dialect was used to conduct the interview if the research nurse was able to communicate in that language or an interpreter was used. Awareness about cervical cancer was determined by asking the patients whether they had ever heard of or about cervical cancer before the interview. Data generated was coded, entered in the computer and analyzed using SPSS version 10.0 (SPSS Inc. Chicago, IL) statistical package. Comparison of means and proportions was done between cervical cancer patients and noncancer patients using Chi-square tests, Fisher's exact test and student t-test where appropriate. Odds ratio (OR) or adjusted OR (AOR) and their 95% confidence intervals (CI) were used to measure strength of associations. A P-value (two-tailed test) of <0.05 was considered significant.

All study participants gave informed consent. The KNH ethics and research committee and the University of Nairobi approved the study.

Results

Over 95% of both cervical cancer and noncancer patients gave consent to participate in the study. There were no significant differences between patients who gave consent to participate in the study and those who declined, with respect to age, education, or indication for being in hospital (data not shown). Cervical cancer patients were significantly

older than noncancer patients (49.1 ± 12.2 vs. 30.0 ± 10.6 years, $P < 0.001$). The mean age at coitarche was similar for the two groups (17.8 ± 3.0 vs. 18.0 ± 3.1 years, $P > 0.05$). Table 1 shows the sociodemographic characteristics of the respondents. On univariate analysis, cervical cancer patients were more likely to be married or in a polygamous relationship. They were more likely to lack education and to have had their first pregnancy when less than 18 years old. They were also more than nine times likely to have had motr than four pregnancies. About 55% reported use of family planning as compared to 45% of noncancer patients. In multivariate analysis including variables significant at univariate level, cervical cancer patients were significantly more likely to have had more than four pregnancies (AOR 2.8), to have used family planning (AOR 1.5), and to lack formal education (AOR 2.7) as compared to noncancer patients. Cervical cancer patients were about eleven times more likely to be greater than 35 years old (AOR 10.6).

About 51% (683/1353) of all patients knew about cervical cancer. The difference in knowledge about cervical cancer between cervical cancer and noncancer patients was not significant (52% vs. 49%, $P > 0.05$). Of the 683 patients who knew about cervical cancer, 5% (34/683) did not respond to the question on perception of risk. The majority 69% (445/649) did not consider themselves at risk of cervical cancer while 14% (88/649) considered themselves at risk and 18% (116/649) had no opinion. Overall, of the 533 patients who were categorical about their perceived risk of developing cervical cancer, noncancer patients were nearly six times more likely to report perceived risk as compared to cervical cancer patients (30.4% vs. 7.2%) (Table 2).

About 90% of the 88 patients who reported perceived risk explained why. Only 9% (7/79) associated risk of developing cervical cancer to STDs while 4% (3/79) associated it with use of family planning (contraceptive pills or IUCD). Four percent (3/79) perceived risk because a close relative had cervical or breast cancer while one patient said it was a disease of old women and she was old. The majority, 62% (49/79), gave general reasons such as everybody is at risk while 20% (16/79) gave incorrect reasons such as history of fibroids, wound on the cervix, etc. There were no significant differences in reasons given for perceived risk between cervical cancer and noncancer patients.

Thirty-two percent (425/1328) of the patients knew what the Pap test is: 33% (217/652) of cancer as compared to 31% (208/676) of noncancer patients ($P > 0.05$). Of the respondents familiar with Pap smear testing, 16% (68/425) did not respond to the question 'What is the purpose of Pap testing?' About 85% of those who responded defined its purpose accurately, while 3% (10/357) indicated it is for checking for infections, 1% (4/357) said it is a routine test for medical examination, and 12% (41/357) did not know the purpose. In response to the question 'How often should a Pap smear be done?' the majority, 69% (207/299) reported yearly, 4% (12/299) said 2–5 years, 2% (7/299) reported more than 5 years or when the doctor decides, Twenty-five percent (75/299) did not know how often a Pap smear should be done and 16% (58/357) did not respond to this question. There were no significant differences between cervical cancer and noncancer patients in knowledge about screening intervals.

Twenty-two percent of all patients (290/1324) had had a Pap smear in the past. About 24% of cervical cancer patients as compared to 20% of noncancer

Table 1. Sociodemographic characteristics of cervical cancer (N=672) and noncancer (N=740) patients interviewed[a]

Variable	Univariate analysis Cervical cancer [N=672 (%)]	Noncancer patients [N=740 (%)]	Multivariate analysis OR (95%CI)	*P* value	AOR (95%CI)	*P* value
>35 years	597/667(89.5)	205/740(27.7)	22.2(16.6-30.3)	<0.001	10.6(7.6-15.2)	<0.001
<14 years at coitarche	57/612(9.3)	57/679(8.4)	1.1(0.8-1.6)	0.561		
Unmarried	54/615(8.1)	184/739(24.9)	3.8(2.7-5.2)	<0.001	1.1(0.7-1.8)	0.576
Polygamous relationship	180/604(29.8)	100/534(18.7)	1.8(1.4-2.4)	<0.001		[b]
Lack education	189/661(28.6)	38/701(5.4)	7.0(4.8-10.1)	<0.001	2.7(1.7-4.4)	<0.001
<18 years at first pregnancy	266/638(41.7)	221/642(34.4)	1.4(1.1-1.7)	0.007	1.3(1.0-1.8)	0.063
>4 pregnancies	459/653(70.3)	130/649(20.0)	9.4(7.3-12.2)	<0.001	2.8(2.0-3.9)	<0.001
Use of family planning	356/652(54.6)	312/691(45.2)	1.5(1.2-1.8)	0.001	1.5(1.1-2.1)	0.014

[a]Abbreviations: OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio. [b]Not included in multivariate analysis to avoid colinearity with marital status

Table 2. Knowledge and practice about cervical cancer and Pap smear testing among cervical cancer (N=672) and non-cancer (N=740) patients[a]

Variable	Cervical cancer N=672 (%)	Non cancer patients N=740 (%)	OR	95%CI	pvalue
Know about cervical cancer	345/662(52.1)	338/691(48.9)	1.1	0.9–1.4	0.239
Perceived risk of developing ICC	23/319(7.2)	65/214(30.4)	5.6	3.4–9.4	<0.001
Know about Pap smear	217/652(33.3)	208/676(30.8)	1.1	0.9–1.4	0.326
Had Pap smear test in the past	155/652(23.8)	135/672(20.1)	1.2	1.0–1.6	0.105
Last Pap smear in ≤1 years	98/149(65.8)	99/127(78.0)	1.8	1.1–3.2	0.026
Last Pap smear in ≤3 years	119/149(79.9)	112/127(88.2)	1.9	1.0–3.7	0.062

[a]OR, odds ratio; CI confidence interval; ICC, invasive cervical cancer.

patients had had a previous Pap smear test ($P > 0.05$) (Table 2). Of the respondents who answered the question 'When was your last Pap smear?' 78% of non-cancer as compared to 66% of cervical cancer patients had their last smear test in the previous year (OR 1.8, $P < 0.05$). Eight percent of cervical cancer patients and 88% of noncancer patients had had a Pap smear in the last 3 years, $P = 0.062$ (Table 2).

Table 3 shows determinants of previous Pap smear testing. On multivariate analysis, previous Pap smear testing was significantly more likely if the patient had cervical cancer (AOR 1.5) or was aware about cervical cancer (AOR 2.1). Patients with some education (AOR 1.9) or those who had used family planning (AOR 2.4)

and condoms (AOR 1.9) were also significantly more likely to have had a Pap smear in the past. Patients greater than 35 years old were also more likely to have been screened for cervical cancer. However, perception of risk of cervical cancer was not associated with history of previous Pap smear testing (OR 1.3, $P = 0.334$) (Table 3).

The majority, 82% (349/425) of the respondents had gotten information about Pap smear testing from health care providers, 7% from friends and womens groups, and 3% through media (newspapers, radio, and television), while 8% did not indicate the source of their information. Cervical cancer patients were 2.5 times more likely to have got information about Pap

Table 3. Determinants of previous Pap smear testing (N=1324)[a]

Variable	Univariate analysis Pap test: No [N=1034 (%)]	Pap test: Yes [N=290 (%)]	Multivariate analysis OR (95%CI)	*P* value	AOR (95%CI)	*P* value
Cancer patients	497/1034(48.1)	155/290(53.4)	1.2(1.0–1.6)	0.105	1.5(1.0–2.1)	0.032
>35 years old	548/1033(53.0)	223/289(77.2)	3.0(2.2–4.0)	<0.001	5.0(3.3–7.7)	<0.001
Age at coitarche <14 years	91/945(9.6)	16/278(5.8)	1.7(1.0–3.0)	0.044	1.8(1.0–3.3)	0.061
Unmarried	169/1034(16.3)	47/290(16.2)	1.0(0.7–1.4)	0.955		
Some education	833/1019(81.7)	256/285(89.8)	2.0(1.3–3.0)	0.001	1.9(1.3–2.6)	<0.001
Use of FP	449/1018(44.1)	200/280(71.4)	3.2(2.4–4.2)	<0.001	2.4(1.7–3.2)	<0.001
>4 pregnancies	436/960(45.4)	134/276(48.6)	1.3(0.9–1.5)	0.357		
Past STD	117/1030(11.4)	43/289(14.9)	1.4(0.9–2.0)	0.105		
>2 life time sex partners	349/967(36.1)	98/282(34.8)	1.1(0.8–1.4)	0.680		
Condom use	200/1022(19.6)	84/288(29.2)	1.7(1.3–2.3)	<0.001	1.9(1.3–2.7)	0.001
Know about CX	462/1029(44.9)	201/288(69.8)	2.8(2.1–3.8)	<0.001	2.1(1.5–2.9)	<0.001
Risk of CX	55/349(15.8)	32/167(19.2)	1.3(0.8–2.1)	0.334		

[a]Abbreviations: CX, cervical cancer; STD, sexually transmitted disease; FP, family planning; OR, odds ratio; AOR, adjusted OR; CI, confidence interval.

smear testing from health care providers than non-cancer patients (89% vs. 76%, OR 2.5, 95%CI 1.5–4.2, $P < 0.001$). Sixteen percent of the patients who had gotten information about Pap smear testing from health care providers did not give an accurate purpose of Pap smear testing.

Discussion

Cervical cancer patients may not be comparable to noncancer patients since they were significantly older and the interview was conducted after they had been diagnosed with cervical cancer. It is, however, notable that despite the fact that cervical cancer patients had contacts with health care providers before they were finally referred to KNH, their overall knowledge about cervical cancer and screening was not significantly better than the noncancer patients.

Knowledge about cervical cancer, the Pap smear test, and previous Pap smear testing was low, even among women with cervical cancer. Forty-nine percent of patients had no accurate knowledge about cervical cancer or about the Pap smear test, and 78% had not had a Pap test. These findings are similar to reports from other developing countries where women's knowledge of cervical cancer and Pap smear testing is very limited[17–19]. Studies among female university students in South Africa[20] and America[21] reported high level of knowledge about Pap smear testing, 74%, and 90%, respectively. A community study in Singapore[14] reported that 73.1% of the respondents knew what Pap smear testing is as compared to 32% in this study. Differences observed between different studies can be explained in terms of different populations involved and different levels of interventions such an existing population-based screening programs[10,14], education background[20,21], or mass media campaigns to popularize cervical screening[14].

A population-based screening program remains the most cost-effective strategy to reduce incidence, morbidity, and mortality from cervical cancer[4,5]. There are several studies showing that knowledge about cervical cancer and Pap testing influences uptake of cervical cancer screening services[10,14,22]. The overall poor knowledge about cervical cancer and Pap testing found in this study would greatly hamper a population-based cytologic screening program in Kenya. Poor knowledge in this study could be related to lack of basic education. Twenty-nine percent of cervical cancer patients were illiterate as compared to 3% among noncancer patients, a significant difference even after controlling for age. The illiteracy rate among cervical cancer patients (29%) is about six times higher than the rate of 5% among general population of women aged 15–45 years[23], suggesting that women who develop cervical cancer have not benefited from the overall increase in literacy levels in Kenya. However, compared to 1990, the illiteracy level among cervical cancer patients has come down by more than twofold from 67.1%[17] to the current level of 29%.

About 22% of all patients in this study had had a Pap smear test in the past. Among cervical cancer patients, 24% had had a Pap smear test while 20% of noncancer patients reported ever having had a Pap smear test. The prevalence of Pap testing in this study is much lower than the Pap smear rate reported in other studies: 80% in a random sample of British women aged 15–78 years[24], 87–88.4% among Hispanic women in America[10,22], and 73.1% among women in Singapore[14]. Several factors could account for this low prevalence, including lack of organized screening programs, lack of awareness, myths, and misconceptions[6,10,11,16,22]. It is notable that only 14% of the patients considered themselves at risk of cervical cancer, which is much lower than the 58.9% reported personal perception of risk among women in Singapore[14] and 89% among Hispanic women in America[10], but close to 20% among South African female university students[20]. Of concern is the finding that patients who considered themselves at risk of developing cervical cancer were not more likely to have had a Pap smear test as compared to those considering themselves not at risk.

The majority of the patients (82%) received information about Pap smear testing from health workers. About 16% of the respondents who got information about the Pap smear from health care providers did not know the purpose of the test. This suggests lack of communication of appropriate information by health care providers to cervical cancer patients. It has been shown that health care providers without appropriate knowledge, attitudes, and practices are not likely to encourage screening[25]. A study among nurses at KNH[26] reported that only 42.3% had had a Pap smear test in their lifetime, about 55.6% had adequate knowledge about signs and symptoms, but knowledge on risk factors was inadequate. However, patients who had formal education, those aware of cervical cancer, or those who had used condoms or family planning methods were more likely to have had a previous Pap smear. These findings suggest that improvement in the proportion of women with

formal education and increased condom and family planning use could increase the number of women being screened for cervical cancer.

From the foregoing, there is significant unmet need for appropriately packaged interventions to increase knowledge about cervical cancer and Pap testing, and to translate knowledge to appropriate behavior change. There is also need to enhance knowledge to change attitudes and practices of health care providers in Kenya, especially the nurses who provide the bulk of health care. One recommendation among other items from the consensus conference on cervical cancer screening and management was continuous education of service providers at various levels of healthcare provision[27]. Without an existing population-based cervical cancer screening in Kenya, health facilities will be most appropriate setting to introduce such an intervention. Currently, there is no policy of out- or inpatient screening services in Kenya, although most of the facilities are able to give these services.

About 70,000 women per year aged above 15 years utilize various facilities at KNH. This accounts for about 1% of women above 15 years in Kenya. Considering that only 20% of noncancer patients had had a Pap smear in the past, an inpatient/outpatient cervical cancer screening program could be an important stopgap without a national population-based screening program. This will also be a crucial opportunity to screen patients who do not have regular check-ups during outpatient care. Hospital/clinic-based screening programs, if strengthened, in Kenya is estimated to cover about 3–5% of women aged above 18 years. This strategy has been advocated and legalized in some health institutions in America (Maryland) to target underserved women[28,29]. Granted that a hospital/clinic-based screening program is unlikely to have similar benefits like national population-based screening program, it nevertheless will be an avenue to sensitize the population for a wider scale screening program and remove health care provider barriers to provision of preventive services.

There are several limitations, which must be considered in interpreting the results. First, cervical cancer patients were not comparable to noncancer patients in some demographic characteristics. The interviews were conducted after cervical cancer patients had been diagnosed to have cancer, therefore for some of the questions asked, the responses may have been biased. Second, this data is based on self-reported information, which could not be validated due to lack of existing data on these patients. Several studies have shown that self-reported behaviors are overestimated[16,30,31]. The third limitation of the study is that the information we collected did not distinguish between diagnostic and screening procedures, which may result in an overestimation of screening behavior. In real life situations, some women may not be able to distinguish between Pap smears, pelvic examinations[32], and vaginal swabs.

In conclusion, this study has shown that there is poor knowledge about cervical cancer and Pap smear testing. There is need to increase awareness about Pap smear testing. More continuous educational approaches to health care providers and especially nurses who provide the bulk of health care in Kenya are likely to improve cervical cancer screening. In addition, a national public health education program, which will reach persons who have no contacts with health care providers, needs to be established. There is need to strengthen the existing health care infrastructure to be able to perform Pap smears to women seeking health care. Strengthening of hospital/clinics to perform Pap smears will be an important component of an awareness campaign so that women who are be made aware about screening would have a facility to visit for the test.

Acknowledgements

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