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ORIGINAL ARTICLE

CERVICAL CANCER: ASSESSMENT OF DIAGNOSIS AND TREATMENT FACILITIES IN PUBLIC HEALTH INSTITUTIONS IN ADDIS ABABA, ETHIOPIA

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ABSTRACT

Background: *Cervical cancer is the second most common cancer in women globally and the leading cause of cancer deaths in women in low income countries. The majority of cervical cancer related deaths occur in the developing world. It is also an important public health problem in Ethiopia, a country without a well-established control program for the disease. This study assessed the diagnostic and therapeutic facility for cervical cancer (including health providers' awareness of the disease) in Addis Ababa public health institutions which can be used to develop control strategies and to visualize the amount of resources required.*

Methods: *A cross-sectional study was conducted including all public health institutions in Addis Ababa in August 2010. Health providers' awareness of cervical cancer was assessed using a self-administered questionnaire. Checklist was used to register diagnostic and therapeutic infrastructure in each health facility. Data was analyzed using STATA.*

Results: *All health providers responded they had heard about cervical cancer. Half of the participants were able to identify common symptoms of the disease. Only 23% of the participants mentioned human papilloma virus (HPV) as the primary cause of cervical cancer. A significant association between awareness and profession was seen. Absence of skilled manpower, equipment and proper documentation was reported in the majority of the institutions.*

Conclusion: *This study assessed the existing skilled man power and infrastructure to diagnose and treat cervical cancer in public institutions in Addis Ababa which is important to develop an effective cervical cancer control program. In addition, the study showed the more work that should be done to improve health providers' awareness in cervical cancer through education and training.*

Keywords*: Public health institutions, cervical cancer, analysis, infrastructure, awareness*

INTRODUCTION

Cervical cancer is the second most common cancer in women globally and the leading cause of cancer deaths in women in low income countries. It is a disease of unfortunate inequities but also of unprecedented opportunities [1]. In 2005, there were, according to World Health Organization (WHO) projections, more than 500,000 incident cases of cervical cancer worldwide, of which over 90% occurred in developing countries. Current estimates show that over one million women have cervical cancer, most of whom have not been diagnosed, or have no access to diagnostic or therapeutic services that could cure them and prolong their life [2]. The highest yearly incidence rate in the world is reported from Recife, Brazil and Cali, Colombia (70/100,000) [3]. In most of the countries in North America and Western Europe, the incidence of cervical cancer has been declining, although recently at a much slower rate. However, in many low and middle income countries the incidence of cervical cancer has not changed, with the exception of countries that have achieved the epidemiological transition with increasing affluence from industrialization [4]. The majority of cervical cancer deaths occur in the developing world which is mainly the result of weak or non-existent cervical cancer control strategies. The reduction in mortality in North America and Europe with the implementation of different control strategies in the past few decades shows the huge opportunity to save the lives of millions of women in low income countries.

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In 2000, there were 57,000 cervical cancer cases in Sub-Saharan Africa constituting 22% of all female cancers which corresponds to an age-adjusted yearly incidence of 31/100,000 [5]. It was highest in the eastern and southern Africa (30-40/100,000) while the rest of the Sub-Saharan Africa had a lower incidence (20-30/100,000), and North Africa had the lowest incidence (12/100,000) [6].

In Ethiopia studies on the epidemiology of cancer in general are scarce. The institutional recording and reporting of cancer related mortality and morbidity lacks completeness. In 2010, Ethiopia had an estimated population of 21 million women aged 15 years and older who are at risk of developing the disease and the age-specific incidence was higher than the world average for women of age 55 and above [7].

After introduction of organized cervical cancer control programs in the Nordic countries in the early 1990s the incidence has declined by 50-80%. A similar reduction was seen in British Columbia[8]. Despite the availability of clear technical guidelines and evidence of success of the control strategies, many developing countries still face high incidence and mortality as a result of lack of awareness of cervical cancer among the general population, health care providers and policy makers, absence or poor quality of screening programs for premalignant lesions and early-stage cancer [2].

The health system in Ethiopia is underdeveloped, and transportation problems are severe. The majority of the population resides in rural areas. It is estimated that about 75% of the population suffers from some type of communicable disease and malnutrition, which could be prevented by various measures [9].The health policy aims at achieving access for all segments of the population through a basic package of primary health care services through a decentralized system of governance including basic curative services, disease prevention and health promotion services [10]. The service is financed by the government, out-of pocket contribution and through external donation [11].

The health care delivery system comprises of three levels [12].

- *Primary health care:* differs between urban and rural areas. In urban areas it includes health centers which are expected to serve 40,000 people. In rural areas it includes health post, rural health center and primary hospital. Health posts give service to 3000-5000 people; rural health centers give service to 15,000-25,000 people and primary hospitals to 60,000-100,000 people.
- *Secondary health care:* includes general hospitals in both rural and urban areas. General hospitals serve 1-1.5 million people.
- *Tertiary health care:* includes specialized hospitals in both urban and rural areas. Specialized hospitals serve 3.5-5.0 million people.

In 2006, Ethiopia attempted to introduce cervical cancer diagnosis and treatment services (control programs in general) after the development of the national reproductive health strategy. The authors of this article were unable to find a comprehensive document to learn the progress of the efforts made [13].The aim of this study was to assess health providers' awareness, available infrastructure and referral systems for the diagnosis and treatment of cervical cancer to contribute to the development of a comprehensive cervical cancer control program in the future.

MATERIALS AND METHODS

A cross-sectional study was conducted including all public hospitals and health centers in Addis Ababa, capital of Ethiopia, in August 2010. The study was conducted in the capital of Ethiopia which is located in the eastern part of Africa (horn of Africa). Geographically the city lies at an altitude of 2300 meters and is a grassland biome, located at $9^0$1'48''N $38^0$44'24''E. Based on the data obtained from the Addis Ababa Health Bureau, there were 3 specialized hospitals, 5 general hospitals and 26 health centers in 2010. Data was collected from all these facilities.

All public hospitals and health centers in the study area were included (Figure 1). For each hospital and health center a checklist was used to record the available diagnostic and therapeutic infrastructure including referral systems. The head of the hospital/health center guided the data collector during this process.

In the assessment of awareness of cervical cancer, only those directly involved in the care of cervical cancer patients were included. In hospitals, the director, one provider from the gynecology outpatient department, one provider from the gynecology ward and one provider from the antenatal care or family planning unit were selected. If there were two or more providers in a unit, one of them was selected randomly. In health centers, the head of the health center, one provider from the general outpatient de-

partment and one provider from antenatal care or family planning unit were invited to participate in the study. If there was more than one provider in a unit, one was randomly selected.

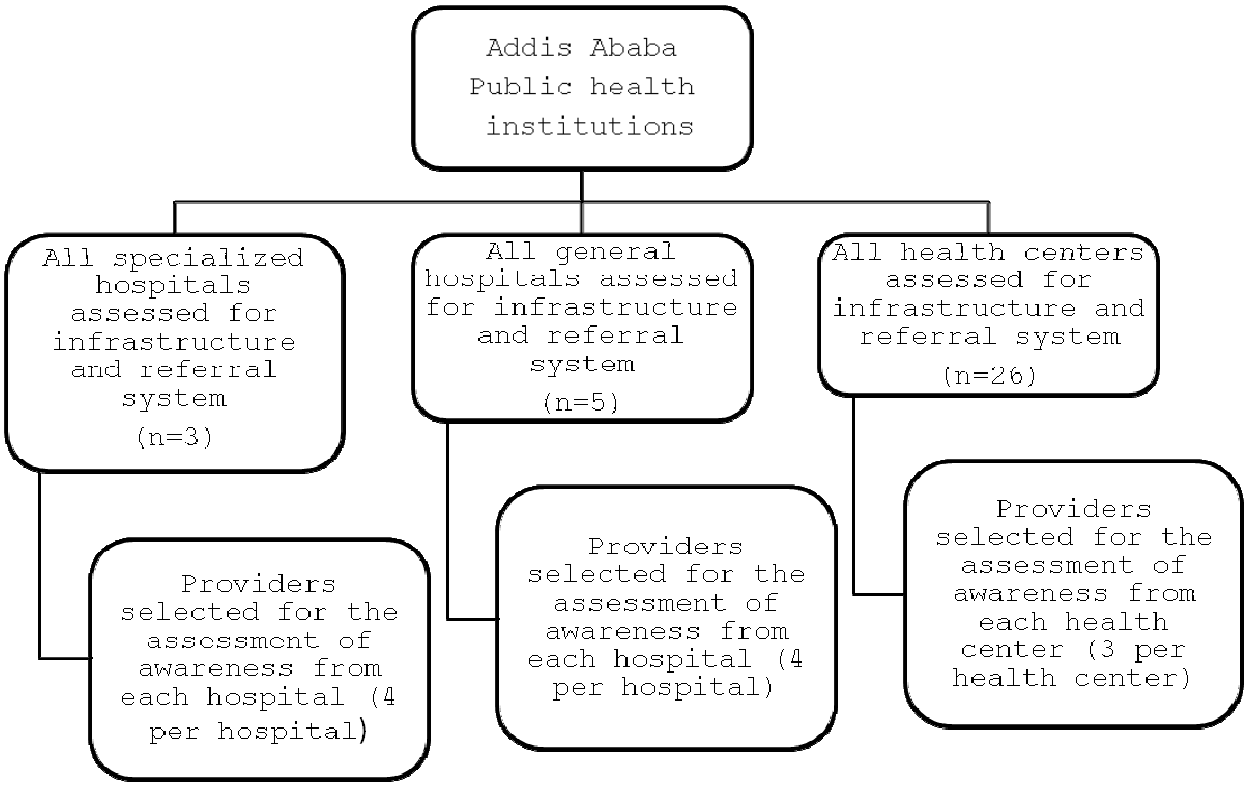

Figure 1-Selection of health institutions and study participants - schematic presentation

A self-administered questionnaire was used to assess the awareness of providers working in gynecology (or in a related) department and a checklist was used to assess the available infrastructure. The self-administered questionnaire and the checklist were based on similar studies in Karachi, Pakistan (Ali et al, 2010) and in East, Central and Southern Africa (Chirenje et al, 2001). The questionnaire consisted of two parts. The first part contained general information about the participants including demographic characteristics and their specific type of work. The second part contained a mix of closed and open ended questions on awareness of cervical cancer diagnosis and treatment. The providers awareness of symptoms of cervical cancer was assessed by listing the common symptoms of the disease mentioned in standard text books of gynecology. The questionnaire lists the common symptoms and participants were asked to mark ‘’yes’’ if they were able to identify the symptom. They were labeled aware of the symptoms if they could identify all the symptoms listed on the questionnaire. The checklist for the assessment of diagnostic and therapeutic infrastructure began with identification of the institution and lists the infrastructure required for the diagnosis and treatment of cervical cancer.

As the study required identification of instruments and documents, the principal investigator recruited data collectors based on their professional health-related background. The principal investigator also participated in the data collection. The data collectors were trained for two days to orient them on the objectives of the study, the methods used, the instrument and the steps they should follow during the data collection. The questionnaire was tested in four of the selected health institutions to assess its reliability and the performance of data collectors.

Data collectors first filled questionnaire for assessment of awareness, and then assessed the infrastructure accompanied by the head of the institution. Assessment was mainly based on interviewing the head of the institution and looking at available documents and equipment. Equipment which was functional was labeled as available.

The collected data was checked for completeness, accuracy and consistency and seven questionnaires had to be excluded as many items were incomplete and inconsistent. Data was computerized using Excel and analyzed using STATA 10 (STATA Corp. Texas, USA). The association between awareness and profession was analyzed using Chi-Square. The level of statistical significance was set at $P<0.05$. The study proposal was reviewed and approved by ethical clearance committee of Addis Ababa regional health bureau. During the data collection, the objectives of the study and anonymity of their response was explained to the participants and their consent was secured.

RESULTS

Health service providers' awareness on cervical cancer: Out of 110 health providers invited to participate in the study two refused and further seven were excluded due to incomplete questionnaires, thus 101 questionnaires remained for analysis.

In total 40 women with median age 26 years (Range: 21-45) and 61 men with median age of 32 years (Range: 23-60) were assessed for awareness (Table 1). One third of the participants worked at hospitals and two third at health centers. Health officers and nurses together constituted more than half (69%) of the participants.

All health providers responded that they had heard about cervical cancer, half of whom were able to identify the common symptoms of the disease described in the literature. The majority of the participants believed that cervical cancer is preventable and also treatable depending on stage of the disease. Out of those participants who said cervical cancer is preventable, 88% mentioned at least one of the modes of prevention and the rest said they did not remember the modes of prevention. Similarly, out of those participants who said cervical cancer is treatable, 89% mentioned at least one of the modes of treatment and the rest did not remember the treatment modalities. In total 69% were able to identify at least one of the screening methods and the rest did not know any of the cervical cancer early detection methods.

Awareness of participants was also compared based on their place of work and profession. Seventy percent of those working in health centers and all providers working in hospitals had seen a patient with cervical cancer even though they may or may not be involved in the care of the patient ($X^2=12.3$, $P<0.001$). Seventy two percent of the participants working in hospitals and 51% of the participants working in health centers were able to identify the symptoms of the disease ($X^2=4.0, P=0.046$). Similarly, 81% of those working in hospitals and 68% of those working in health centers believed cervical cancer is preventable ($X^2=1.9$, $P=0.17$); and 97% of those working in hospitals and 70% of those working in health centers believe cervical cancer is treatable ($X^2=9.6, P=0.002$). In addition, a significant association between awareness and profession was also noticed ($P<0.05$) (Table 2).

Overall, only 23% of the study participants mentioned HPV as the primary cause of cervical cancer. More than half (55%) of the medical doctors (including general practitioners and gynecologists), but only 10% of the health officers and 7% of the nurses mentioned HPV as a primary cause for cervical cancer.

Table 1 - General characteristics of the study participants.

Characteristic	Number (n=101)	Percent
Age (years):		
20-29	52	51
30-39	29	29
≥40	20	20
Sex:		
Male	61	60
Female	40	40
Profession:		
Gynecologist	9	9
General practitioner	22	22
Health officer	29	29
Nurse	41	40
Place of work:		
Hospital	32	32
Health center	69	68

Table 2–HPV Awareness by place of work and Profession (n=10)

Place of work/ profession	Awareness					
	Heard about cervical cancer	Seen a patient	Know the common symptoms	Believe cervical cancer is preventable	Believe cervical cancer is treatable	Performed or ordered any of the screening methods
Place of work:						
Hospital (n=32)	100%	100%	72%	81%	97%	22%
Health center (n=69)	100%	70%	51%	68%	70%	11%
X^2-value	-	12.3	4.0	1.9	9.6	-
P-value	-	<0.001	0.046	0.17	0.002	0.23
Profession:						
Gynecologist (n=9)	100%	100%	89%	100%	100%	78%
General practitioner (n=22)	100%	100%	82%	91%	100%	27%
Health officer (n=29)	100%	69%	38%	69%	79%	0%
Nurse (n=41)	100%	71%	51%	59%	61%	5%
P-value	-	0.003	0.002	0.007	<0.001	<0.001

Twelve of the health centers (46%) had general practitioners. The number of general practitioners in these institutions ranged from one to two. All the health centers were served by health officers and nurses both of which handle the outpatient reproductive health and other services in the health centers. There was one hospital with no gynecologist. Seven hospitals had no pathologist and thus could not give histopathology services. The number of general practitioners in the hospitals ranged from 12 to 200 (Table 3). All the gynecologists had the surgical skills to handle suitable cervical cancer patients. No provider was found with the basic diagnostic and therapeutic trainings such as Visual Inspection with Acetic acid (VIA), Visual Inspection with Lugol's Iodine (VILI), colposcopy, cryotherapy, loop electrosurgical excision procedures (LEEP), and cone biopsy. Only five of the pathologists working in one of the tertiary hospitals were trained on Pap smear.

Cervical cancer screening and related therapeutic services like cryotherapy and LEEP were not offered in all of the public institutions. Only one hospital was found to provide histopathology service performing Pap smear and biopsy for diagnostic purpose. All of the hospitals offered major surgical services. Radiotherapy service was available only in one of the hospitals (Table 4).

All the hospitals and health centers were found to have clean water source and 24hours electricity supply. All the institutions had enough number of rooms to accommodate future introduction of cervical cancer diagnosis and treatment services. Equipment such as examination couch and screen were available in all of the institutions. Cleaning equipment, protective materials, stationeries and laboratory accessories were also available in all of the institutions.

None of the institutions have a cancer register. Out of all the institutions, only one hospital was found to have protocol on cervical cancer diagnosis and treatment (Table 4). During the assessment, no cryotherapy equipment and LEEP set was found in all of the institutions. Four hospitals had the necessary equipment to do biopsy of the cervix.

Based on the national guideline for referral systems, health centers refer patients to the nearby hospital for better service or they refer to another health center for patient's convenience. Referral of patients between hospitals is also possible. The communication is mainly through referral slips. All the institutions were found to have external referral slips. Only six of the health centers and none of the hospitals had internal referral slip. Nine (35%) health centers kept the records of referred patients and only one hospital was found to have a similar record. None of the institutions received feedback on referred patients.

The main reasons for referral were lack of trained man power and absence of necessary equipment or drugs in all of the hospitals and health centers. Only one health center mentioned busy providers as a reason in addition to the aforementioned two reasons.

Table 3–Distribution of health care providers in the health centers and hospitals

Number of providers	Number of	
	Health center	Hospital
Gynecologist :		
0	26	1
2-6	0	7
Other specialties:		
0	26	0
1-47	0	8
Pathologist:		
0	26	7
5	0	1
General practitioner:		
0	14	0
1-2	12	0
12-200	0	8
Health officer:		
0	14	0
2-12	25	8
Nurses:		
1-100	26	1
101-200	0	7
Laboratory personnel:		
0	1	0
2-10	25	2
11-83	0	6
Pharmacy personnel:		
1-10	26	2
11-92	0	6
Total number of institutions	26	8

Table 4 - Offering different reproductive health services and availability of diagnostic and therapeutic instruments at the health centers and hospitals**.**

Health services/Instruments	Number of	
	Health center	Hospital
Reproductive health services:		
Gynecology out patient	26	7
Gynecology in patient	0	6
Antenatal care	26	7
Family planning	26	7
Maternity care	25	7
Histopathology	0	1
Colposcopy	0	1
Surgery	0	8
Availability of diagnostic/therapeutic instruments:		
Treatment protocols	0	1
Colposcope	0	1
Colposcope tray	0	1
Specula of different sizes	15	6
Vaginal sidewall retractor	10	7
Endocervical specula	10	6
Endocervical curette	12	6
Uterine sound	12	7
Total number of institutions	26	8

DISCUSSION

Awareness on the diagnosis and treatment of cervical cancer: All participants reported that they had heard about cervical cancer. As one of the major causes of cancer-related deaths in females in Ethiopia, health providers are highly likely to hear about the disease either during training or practice. This can also be taken as a clue indicating the commonness of the problem. The finding of a study conducted by Hoque taking a sample of female Mangosuthu university technology students in South Africa showed that 33% had heard about cervical cancer which is far less than the current finding (100%) [14]. This difference could be explained by the type of training the participants received and work related experience [15].

Only half of the providers could identify the common symptoms of cervical cancer. Although the measure was crude and assumed to test their awareness to the minimum, the observed finding was suboptimal. This indicated the huge work that remains to be done in raising the awareness of providers. This could also be one of the reasons for the late presentation of cervical cancer patients which is seen in most developing countries as a result of a delay in referring for proper management [16].

The majority of the participants (72%) believed cervical cancer is preventable, which is higher than among female technology students in South Africa [14]. However, all should have known that it is possi-

ble to prevent the disease. If the providers do not have the necessary knowledge, it will have an implication on their day to day activities. Obviously, health providers should do better than technology students on this aspect. In a cross sectional study of health providers in Greece, 98% stated that cervical cancer is preventable and treatable which was much greater than our finding.[17].

In most developing countries the basic reason for low coverage of screening services is the scarce health care budget which precludes initiating and sustaining such programs even in a limited part of the countries [18]. In the years 2001-2002 the coverage of the cervical cancer screening program in Ethiopia was 1.6% in urban areas and 0.4% in rural areas [19]. In our study, only 15% of the providers performed or referred women for screening which affects the program coverage.

Nowadays, preventive efforts to decrease the burden of cervical cancer seem to focus on prevention of HPV infection through sexual education and vaccination. Surprisingly, only 23% of the providers mentioned HPV as a primary cause for cervical cancer. The majority of the participants were unaware of the primary cause of cervical cancer which could affect their effort to prevent the disease. This could be due to low emphasis given to the disease in training health providers. A cross-sectional study conducted in Pakistan among interns and nursing staff showed a similar result [20].

As expected a higher proportion of medical doctors know the cause of cervical cancer. In contrast, only 10% of the health officers and 7% of the nurses are able to mention HPV as a primary cause. Obviously, this could be due to type of training they received. However, this information is equally needed by all the professions. Nurses are the front line health workers in most of the public health services and usually involved in health education. They need all the necessary tools to educate their patients. This finding may highlight where to act in planning further education to health providers. In most awareness measures a larger proportion of doctors did better than health officers and nurses. This was in agreement with a cross sectional study from Ibadan which showed that doctors had the highest level of knowledge followed by nurses and hospital maids[21].

Providers working in hospitals had higher awareness of cervical cancer than those working in health centers. This could be due to the presence of highly qualified co-workers, the practical teaching offered in most of the hospitals in related disciplines, the higher chance to encounter cervical cancer patients as a result of a relatively better diagnostic facility and the referral of patients from health centers to hospitals.

Ethiopia, like most of Sub-Saharan countries, is known by a long standing shortage of health manpower coupled with severe lack of infrastructure with a physician to population ratio of 1:42,000 which is far below WHO standard (1:10,000) and also five times below the Sub-Saharan average [22, 23]. Additionally, the distribution of the limited health manpower is not uniform with the majority of the providers serving in urban areas. Our study showed a lack of trained providers such as gynecologists, pathologists and general practitioners in the health institutions. Only one hospital was found to have pathologists with histopathology laboratory and with the necessary training to do Pap smear which makes wide application of cytology based screening impractical even in the capital.

The absence of trained providers on VIA, VILI, colposcopy, cryotherapy and LEEP makes early detection and treatment of cervical cancer far from reality. The absence of cervical cancer diagnosis and treatment protocol in the majority (97%) of the health institutions and absence of a national cancer register were among the problems which indicated the lack of emphasis given to cancer control in general and cervical cancer control in particular. The absence of diagnostic and therapeutic protocols can lead to suboptimal care and clients who need thorough diagnosis and treatment will be overlooked. A similar cross-sectional study by Chirenjen and coworkers demonstrated a huge infrastructure gap in East, Central and Southern Africa [24].Our study also demonstrated absence of a uniform recording of referred patients and provision of feedbacks. Several studies conducted in developing countries have also identified poor communication and feedback systems between all levels of institutions which is compounded by poor information and monitoring system [4].

In this study, awareness was assessed from providers who were in charge of patients with cervical cancer (providers working in reproductive health units), which may not directly reflect the level of awareness of all the providers working in the selected institution. However, those working in the reproductive health units are assumed to have better knowledge of cervical cancer as their day to day encounter of related conditions may help them grasp some level of understanding. In addition, our study investigated

awareness at its lowest level. Further exploration of awareness is recommended to be more informative which can be considered in future studies.

In conclusion, this study assessed the existing skilled man power and infrastructure in public institutions in Addis Ababa which is important to develop an effective cervical cancer control program. In addition, the study showed the more work that should be done to improve health providers' awareness in cervical cancer through education and training. Intensive literature search in the area also revealed no similar studies conducted in the same setting. This study may stimulate professionals working in the field to go further and will also contribute to the national data base.

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