RESEARCH ARTICLE

Cervical Cancer in Morocco: Epidemiological Profile from Two Main Oncological Centers

Mohamed Berraho[1,2]*, Karima Bendahhou[1], Majdouline Obtel[1], Ahmed Zidouh[3], Abdellatif Benider[4], Hassan Errihani[5], Chakib Nejjari[1]

Abstract

Background: In Morocco, the epidemiological profile of cervical cancer is not well established. The focus of the present study was both epidemiological and pathological characteristics. Methods: For all cases of cervical cancer treated between 2003 and 2007 in the National Institute of Oncology and the Oncology Department of the IbnRochd hospital (Casablanca), 900 cases were randomly selected. Results: The mean age was 52.1±11.8 years. The most (90.5%) represented histological type was squamous cell carcinoma. For more than 57.0% cases the mean distance between patient's origin and center of treatment was greater than 100km. According to the FIGO classification, only 17.2% of patients were identified as being in early stages (0 and I). For 72.2% patients the follow-up did not exceed 2 years. At 1 year of following-up 55.8% of patients were alive and 43.4% were lost to following-up. Conclusion: Our study addressed the issue of the burden of cervical cancer in Morocco. The result provides a basis for decision-makers for the development of strategic measures to implement the fight against cervical cancer in Morocco.

Keywords: Uterine cervix - cervical cancer - epidemiological profile - cross sectional study - Morocco

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Introduction

Cervical cancer is the second most common cancer among women worldwide (Parkin et al., 2005). It accounted for an estimated 529 409 incident cases, 15.2 incident cases per 100000, and 274 883 deaths in the world in 2008 (Ferlay et al., 2010) constituting approximately 8% of the global burden of cancer among women (Ferlay et al., 2010).

The incidence of cervix cancer is significantly higher in developing countries (respectively 9 and 17.8 cases per 100,000 per year in developed and developing countries). More than 80% of the global burden of cervical cancer is found in developing countries (Ferlay et al., 2010) where organized screening programs are absent or limited which make it in the first rank of cancers affecting women (Sankaranarayanan et al., 2001; International Agency for Research on Cancer (IARC), 2008).

Although it is a preventable disease, cervical cancer still weight heavily on health resources in developing countries, where women come with advanced stages, often incurable, which affects negatively the prognosis and therefore the disease remains largely uncontrolled especially within the absence of screening (IARC, 2008). In Morocco, cervical cancer is the second most common cancer of women after breast cancer (Gueddari, 2001). According to GLOBOCAN report 2008 (Ferlay et al., 2010), the age-standardized incidence of cervical cancer among women in Morocco was 14.1 new cases/100 000 women / year (1979 new cases/year). The rate of death due to this disease was 8.4 per 100 000 (1152).

The epidemiological profile of cervical cancer is poorly known because of the absence of a national cancer registry, the lackness of epidemiological studies as well as the absence of a screening program.

The present study was conducted with the objective of examining descriptive epidemiological and pathological characteristics of cervical cancer among of patients visiting the most important oncology centers of Morocco.

Materials and Methods

Design and population

A retrospective study on data from hospitals' records was carried out between April and May 2008. Estimating the existence of 9000 records for cervical cancer in Morocco for five years (2003-2007), 900 cases were randomly selected, by systematic sampling, and after evaluating records, 890 records have been retained.

This study was conducted at the National Institute of Oncology (INO) in Rabat and the Oncology Department of the Ibn Rochd hospital in Casablanca.

*[1]Laboratory of Epidemiology, Clinical Research and Community Health, Faculty of Medicine, Fez, [3]Lalla Salma Association Against Cancer (ALSC), [5]National Institute of Oncology (INO), [4]Oncology Department, Ibn Rochd University Hospital Center, Casablanca, Morocco, [2]Team "Epidemiology of Cancer Prevention" INSERM 897 ISPED ; Bordeaux, France *For correspondence: maberraho@yahoo.fr*

Data collection

The data concerned the sociodemographic characteristics (age, sex, level of education, health insurance, residence of patients), FIGO classification of cervical cancer, type of treatment (surgery/radiotherapy/chemotherapy/other treatments) and patient outcome for at least one year of following-up (loss of following-up, healing/relapse/death). Data collection was performed by a group of trained interviewers (Physicians) from the patient records filed in the archives using a standardized form.

Data analysis

The analysis involved a description of the sample according to sociodemographic characteristics, access to care, stages at diagnosis, received treatment and treatment outcome at 1 year of following-up. Summary statistics were used to describe the studied population. Results were reported as percentage and mean and standard deviation.

Results

The study focused on 890 cases of patients with cervical cancer during five years (2003-2007). The age of the studied population ranged between 18 and 90 years old, with a mean (SD) age of 52.1 ± 11.8 years. Almost 87.0% of cases were aged 40 and over. Only 7.8% of our sample had a professional activity and 90.7% were housewives. 68.7% of our sample were married and 21.1% were widowed. 59.2% of the patients dwelled in urban areas. Only 6.5% of the patients had got health care insurance. 92.2% had a low socioeconomic level and 84.4% were illiterate (Table 1).

The predominant presenting symptoms were abnormal vaginal bleeding (90.0%), malodorous discharge (35.1%) and pelvic pain (34.1%) (Table 2).

The most represented histological type was squamous cell carcinoma (SCC) (90.5%) followed by adenocarcinomas (5.0%) and 4.5% for other histological types. Histologically, only 29.5% of cervical cancer were well differentiated, 51.4% were intermediately-differentiated, 17.6% were poorly-differentiated and 1.5% were undifferentiated (Table 2).

Among patients with cervical cancer, 0.6% had a personal history of cancer and 2.8% had a familial history of cancer. Of those who had a familial history of cancer, 72.7% concerned a first grade family relationship and 31.8% of the cases were a gynecological cancer (Table 2). In 64.7% of the cases, diagnosis of cervical cancer was done in a public institution. The mean distance between the patient's residence and place of diagnosis was 158 km and for more than 52.0% of the patients the distance was farther than 50 km. The mean distance between the patient's residence and the center of treatment was 209 km and for more than 57.0% of the patients the distance was farther than 100 km.

According to FIGO classification, only 17.2% of the patients were identified as being in early stages (stage 0 for 0.5% and stage I for 16.7%) and 82.8% were presented in between intermediate and advanced stages: stage II for 43.7%, stage III for 31.8%, and stage IV for only 6.3%. Patients with tumors in stage I were treated by surgery for 85.6%, by radiotherapy for 70.3% and chemotherapy for only 26.0% (Table 3). Patients with tumors in stage II were treated by an exclusive radiotherapy (11.9%) or associated with chemotherapy (30.0%) and the surgery was indicated for 44.7% of the patients (Table 3). An

Table 1. Sociodemographic Characteristics of Patients with Cervical Cancer (N=890) in Two Oncological Centers in Morocco, 2003-2007

		%
Age (years) mean (SD)		52.1 (11.8)
Profession:	Active	7.8
	Retired	0.2
	Unemployed	1.4
	Housewife	90.7
Educationnel level:	Illiterate	84.4
	Primary	6.3
	Secondary	9.4
	High	0.0
Marital Statut:	Single	1.2
	Married	68.7
	Divorced	9.0
	Widowed	21.1
Number of children (Mean (SD))		4.9 (2.6)
Socioeconomic level:	Low	92.2
	Medium	7.5
	High	0.3
Origine (Urban)	59.2	
Health insurance (yes)	6.5	

Table 2. Medical and Pathological Characteristics and Accessibility to Care of Patients with Cervical Cancer (N=890) in Two Oncological Centers in Morocco, 2003-2007

		%
Presenting symptoms:	Abnormal vaginal bleeding	90.0
	Malodorous discharge	35.1
	Pelvic pain	34.1
FIGO staging:	Cis	0.5
	Ia	2.1
	Ib	14.6
	II	43.7
	III	31.8
	IV	6.3
Histological Aspects of Uterine Cervix:		
	Squamous cell carcinoma	90.5
	Adenocarcinoma	5.0
	Others histological types	4.5
Antecedent of cancer:	Personal	0.6
	Familial	2.8
Distance between the patient's origin and place of diagnosis (Km):	≤5	38.9
	06--20	5.0
	21-50	1.8
	51-100	13.1
	101-300	24.0
	>300	17.1
Distance between the patient's origin and center of treatment (Km):	≤5	18.2
	06--20	5.1
	21-50	3.7
	51-100	15.9
	101-300	36.2
	>300	20.8

Table 3. Distribution of Patients with Cervical Cancer by Type of Treatment Received and Stage of Diagnosis in Two Oncological Centers in Morocco, 2003-2007

Treatment	Stage of diagnosis					Total
	0	I	II	III	IV	
Surgery	100	27.5	7.7	0.4	8.6	9.4
Surgery + Chemotherapy	0.0	0.8	1.5	0.0	8.6	1.2
Surgery + Radiotherapy	0.0	39.0	14.8	2.2	8.6	14.9
Surgery + Radiotherapy + Curitherapy	0.0	1.5	2.7	1.8	0.0	2.1
Surgery + Radiotherapy + Chemotherapy	0.0	14.5	16.5	4.9	5.7	12.2
Surgery + Radiotherapy + Chemotherapy+ Curitherapy	0.0	2.3	1.5	1.8	0.0	1.6
Chemotherapy	0.0	1.5	3.3	7.1	20.0	4.9
Radiotherapy	0.0	5.3	11.9	29.5	20.1	16.5
Radiotherapy + Curitherapy	0.0	0.8	4.2	7.1	5.7	4.5
Radiotherapy + Chemotherapy	0.0	5.3	30.0	36.7	22.9	27.1
Radiotherapy + Chemotherapy + Curitherapy	0.0	1.5	5.9	8.5	0.0	5.6

Table 4. Distribution of Patients with Cervical Cancer by Duration of Following-Up and by Vital Status at 1 year of Following-Up in Two Oncological Centers in Morocco, 2003-2007

		%
Duration of following-up (monthly)	≤6	33.0
	7-12	15.1
	13-24	24.1
	>24	30.8
Vital status at 1 year of following-up:	Living	55.8
	Lost	43.4
	Died	00.8

exclusive radiotherapy was prescribed for 29.5% patients in stage III; it was associated with chemotherapy for 36.7% of the patients (Table 3). Patients with stage IV were essentially treated by an exclusive radiotherapy (20.1%) and by an association of radiotherapy and chemotherapy (22.9%) (Table 3).

The mean following-up was 17.44 ± 16.43 months and for 72.2% of the patients this duration did not exceed 24 months (Table 4). At 1 year of following-up, 55.8% of the patients were alive, 43.4% lost following-up and 0.8% died in the hospital (Table 4).

In Table 5, we present the association between status at 1 year of following-up and the characteristics of patients with cervical cancer. Only the stage of diagnosis was significantly associated with status at 1 year of following-up (P<10-6). The rate of patients who lost following-up increased with the stage of diagnosis (30.1% for stage I to 79.2% for stage IV).

Discussion

This study investigated epidemiological, clinical and pathological profile of cervical cancer in Morocco. It mainly uncovered a problem of tardy diagnosis, difficult accessibility to health care facilities, a problem of high rate of patients who lose following-up and an insufficient duration of following-up.

This study showed a delayed diagnosis of cervical cancer in Morocco. Indeed, the majority of patients were presented in between intermediate and advanced stage (stage II, III and IV). The stage of diagnosis is the most important independent prognostic factor (Fyles et al., 1995; Barillot et al., 1997). As a matter of fact, survival rate at 5 years decreases with stage of diagnosis: 85% for stage IB to 0-20% for stage IV (Perez et al., 1992, 1997). The mortality rate from cervical cancer is highly dependent on stage of diagnosis. Younger women are more likely to be diagnosed with localized cancer which carries a good prognosis (National Cancer Institute USA, 2009). Similarly, the risk of pelvic recurrence increases with the stage, 10% for stage IB to more than 75% for stage IV (Perez et al., 1992, 1997). Finally, the risk of distant metastases also increases with the stage, respectively 16%, 26%, 39% and 75% for stages I, II, III and IV (Fagundes et al., 1992).

Early Clinical diagnosis has been responsible for the reduction of cervical cancer mortality achieved in developed countries before cervical screening programs were adopted (Ponten et al., 1995; Sparen et al., 1995; Jacqueme et al., 2002).

This is one of the easiest types of cancer which are likely to be prevented and is more accessible to diagnosis with early detection and rapid response by appropriate treatment. In fact, cervical cancer is preceded by epithelial cell abnormalities which can be detected by Pap smear (Hakama et al.,1985; Bergeron et al., 2005). In countries with screening programs such as Canada, South Korea and Scandinavian countries, the lowest incidence of cervical cancer is observed with higher level of early stages (Boo et al., 2011; IARC, 2008). Until the early 1970s, approximately 75% to 80% of cervical cancer in the USA is invasive at the time of diagnosis. With the initiation of cervical screening, about 78% of the cases of this cancer are diagnosed at carcinoma in situ stage (Miller et al., 1996).

In our study, the mean age of cervical cancer cases was 52.1±11.8 years old and 87.0% of the cases aged 40 and over. The determination of the age trends at presentation for cervical cancer are important as it helps in the identification of the target age group for the implementation of cervical screening by a single smear in the life time methodology (IARC, 2008). The mean age in our study is similar to the mean age of cervical cancer in Tunisia (51.2 years old) (Missaoui et al., 2010). It is slightly higher than the mean age reported in France (51 years old) (Remontet et al., 2003a; Remontet et al., 2003b). Elsewhere in Africa, the mean age was lower: 35 in Dakar and 48 in Burkina Faso (Lankoande et al., 1998) and Madagascar (Pignon et al., 1993). The older mean age in the present study probably indicates a later exposure to risk factors or reflects the belated consultation and the lack of screening.

In our population, the majority of women had a low socioeconomic level. Indeed, only 6.5% of the patients

had health care insurance and 84.4% were illiterate. Only 7.8% of our sample had a professional activity and 90.7% were housewives. Various studies have shown a strong inverse association observed between socioeconomic indicators and the risk of invasive cervical cancer. Women categorized in a low social class were exposed, in a meta-analysis of international data, twice to the risk of cervical cancer compared to women defined as belonging to a high social class (Parikh et al., 2003). In the USA, the inverse relationships of risk with income and education prevail among both whites and blacks (Khan et al., 2005). Social deprivation did not demonstrate an association with levels of pelvic recurrence, metastasis or death. The low doctor-patient ratio in certain geographical areas reduces access to medical care (Dalmon et al., 2009).

Our study also pointed the problem of access to health care facilities. Cancer is a chronic disease that requires heavy treatment and durable following-up. Thus, access to care is an important and a decisive element of good monitoring and therefore good prognosis. This is actually true, especially when one knows that our population belongs to a low socioeconomic level and that traveling to the centers of treatment represents a financial charge in addition to the physical difficulty.

The following-up does not exceed 2 years in 72.2% of cases and 43.4% of the patients lost following-up at 1 year. Monitoring patients with cancer is a mainstay in the management of this disease and allows the management of possible complications and recurrence or relapse. The duration of monitoring in our study is very limited and may be due to low socioeconomic level and/or advanced stage of diagnosis of patients which may be the source of high mortality. Thus, further studies are necessary to determine the outcome of patients and identify factors associated with the loss of following-up.

Our pathological data joined those already described with the large predominance of squamous cell carcinoma (Gien et al., 2010; Karimi et al., 2010); the most represented histological type in our study was squamous cell carcinoma (90.5%); the adenocarcinomas and adenosquamous cell carcinomas represented only 5.0% of cervical cancer. Over the past 40 years, multiple reports have documented the increase in relative distribution of adenocarcinoma compared to SCC in developed countries (Smith et al., 2000; Wang et al., 2004). In the USA, from 1973 to 1977, the proportions of SCC and adenocarcinoma were 88% and 12%, respectively; however, from 1993 to 1996, the proportions were 76% and 24% respectively (Smith et al., 2000).

In our study, treatment varied depending on the stage of diagnosis. Surgery was indicated for very early stages whereas radiotherapy was indicated for the different stages. Chemotherapy was used slightly at a localized stage, for advanced tumors (≥ stage II) concomitant chemotherapy was associated with radiotherapy and / or curietherapy which join, in general, the recommendations of chemotherapy in cervical cancer (Resbeut et al., 2003).

In our population, the rate of patients who lose following-up increased with the stage of diagnosis. This association shows the importance of early diagnosis. Morocco is endowed, since March 2010, of a National Plan for the Prevention and Control of Cancer (PNPCC). Screening and treatment of cervical cancer in Morocco represent the most crucial priorities for PNPCC. A screening program for cervical cancer is being introduced as well as other measures in order to improve the opportunities of access to early diagnosis by reducing geographical obstacles, multiply the number of centers of diagnosis confirmation, reduce economic barriers and provision facilities and resources. The installation of a screening program for cervical cancer will be based on infrastructure and personnel, primarily general practitioners, of primary level of health care delivery. A pilot mass screening performed in Lyon has clearly shown that intensive action, involving all local stakeholders including general practitioners, could reach a population of women who do not benefit from an adequate gynecological following-up (Mignotte et al., 1999).

We conducted our study in two centers: the National Institute of Oncology in Rabat and the Oncology Centre in Ibn Rochd University Hospital of Casablanca. Indeed, these two centers were accounted for until 2007 the only public centers of cancer management in Morocco. In addition to that, the private sector (represented, until 2007, by only three private clinics: two in Casablanca and one in Rabat) recruits a very small proportion of cancer cases in Morocco. As we worked on hospital records in the period between 2003 and 2007, we believe that our population can be considered as a representative sample of cases of cervical cancer who access to health system in Morocco.

In conclusion, our study addressed the issue of burden of cervical cancer in Morocco. It helped to highlight a range of issues on which we can act and thus modify. And it will be the basis for decision-makers for the development of strategic measures to implement the fight against cervical cancer in Morocco. Also, the results of our study will represent a benchmark for evaluating various activities in the framework of the (PNPCC) for the early detection and treatment of cervical cancer in Morocco.

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