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Ovarian cancer in Kenyatta National Hospital in Kenya: Characteristics and management*

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ABSTRACT

Background: Ovarian cancer is the third commonest cause of cancer death from gynaecologic tumors in Kenya. Early disease causes minimal, nonspecific, or no symptoms therefore, most patients are diagnosed when the disease is at an advanced stage. Overall, prognosis for these patients remains poor but has not been described in Kenya. Objectives: To describe the histological types, therapeutic methods used, therapeutic outcome and the survival rate at 2 years. Methods: This was a retrospective cross-sectional descriptive study undertaking a 10-year review of case records of patients treated for cancer of the ovary between 1998 and 2008 in Kenyatta National Hospital. Results: Majority of the patients (73.3%) presented with advanced stage of disease (stages III & IV). Epithelial tumors (86.2%) are the commonest histological type, with 45.7% of them being serous type. Chemotherapy was the most (46.0%) used therapeutic option, with vomiting and diarrhea being the leading morbidity associated with it. Survival at 2 yrs from diagnosis was 50% as per the Kaplan-Meier time survival estimate. Conclusion: There is need to improve the quality of data on cancer care and information systems in general to provide a reliable source of information to guide research and policy in oncology. Further, the late presentation to hospital calls for innovative strategies to improve ovarian cancer awareness and uptake of screening tests. There is need to lobby Governments in resource limited setting to subsidize cancer of the ovary care and invest in lower level health facilities to promote early diagnosis and decongest the referral hospital.

Keywords: Ovarian Cancer; Histological Types; Therapeutic Methods; Survival

1. INTRODUCTION

Ovarian cancer is the third most frequent cause of death from gynaecological cancers worldwide. It is the third commonest cause of cancer death from gynaecologic tumours in Kenyatta National Hospital (KNH), Kenya. Ovarian cancer in its early stages (I/II) is difficult to diagnose until it metastasises and advances to later stages (III/IV) [1]. This is largely because of the non specific nature of early symptoms and a lack of a sensitive cost-effective screening test [2]. Due to this, more than half of the women with ovarian cancer are diagnosed in the advanced stages of the disease with overall poor prognosis [3]. This poor prognosis is further worsened by lack of trained Gynaecologic Oncologist in resource limited settings, which culminates to sub-optimal treatment to these patients. The standard treatment involves aggressive cytoreductive surgery followed by chemotherapy [2,4]. There is limited information on epidemiology of reproductive cancers including ovarian cancer from developing countries, and where available it is mostly from institutional-based data and is of poor quality. This is largely from lack of standardized encounter form, a robust data base and absence of a national data registry. This lack of information poses a challenge to development of innovative interventions of managing cancer of the ovary in these settings.

Majority (75%) of the cases seen at the KNH, a national referral centre and teaching hospital providing cancer treatment in the country are diagnosed at stage III and IV of disease. Over the last number of years, there has been an increase in the number of ovarian cancer cases being admitted at KNH. All cancer admissions in KNH rose from 2098 in 1998 to 3624 in 2008, an increase of about 73%. Cancer mortality experienced similar trends rising from 594 in 1998 to 1059 in 2008, an

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increase of 78%. The trend is typified in most resource limited settings where cancer is increasingly becoming the commonest non-communicable disease. In Kenya for instance; the cancer mortality is expected to more than double (121%) in the next 25 years while deaths from communicable diseases will only have a marginal increase (6%) (2).

Due to the high mortality associated with carcinoma of the ovary, and the late stage at which they normally present, we sought to describe this population in regard to histological types, treatment outcomes and two year survival rates among cancer of the ovary patients managed at KNH with aim of identifying potential areas of intervention to improve screening, diagnosis and management.

2. METHODS

2.1. Study Design

This was a retrospective cross-sectional descriptive study.

2.2. Study Setting

The study was undertaken at Kenyatta National Hospital (KNH) by reviewing case records of patients treated with cancer of the ovary. KNH is the largest hospital in the country; it serves as a referral, teaching and research centre and provides facilities for undergraduates, postgraduates, and paramedics training. In addition, it gives basic healthcare to the people of Nairobi and its surroundings with a 1800 bed capacity. It is one of the two government owned centres that provide oncology care in Kenya. KNH has two Gynaecologic Oncologist and 29 general Obstetricians and Gynaecologists. There is no designated Gynaecologic Oncology unit, further, lower level facilities have no or limited capacity for screening and diagnosis. After cytoreduction of the tumour and histologic confirmation of ovarian cancer patients are given first line chemotherapy (carboplatin and paclitaxel). Cancer treatment at KNH is not free and individual patients have to pay out of pocket for the treatment.

2.3. Study Population

All patients who had histologically confirmed diagnosis of cancer of the ovary at the Kenyatta National Hospital, between 1998 and 2008 formed the study population.

2.4. Sample Size Calculation and Sampling Procedure

All the patients' files (224) that met the inclusion criteria formed the sample size. This is because the study population was not large enough and there was a likelihood of introducing bias and variation in the result/findings if sampling had been done. The study obtained a list of all admissions of cancer of ovary cases from 1998-2008. The list consisted of both live and deceased cases attended at KNH during the period. The total admission episodes for cancer of the ovary were 899. However, this count included patients with multiple re-admissions. There was thus need to filter out these multiple re-admission cases and remain with individual cases that contained both cases with confirmed and un-confirmed histology. The final phase included filtering out the cases with unconfirmed histology see **Figure 1** below.

2.5. Data Management

The main study variables were categorized into independent and dependent variables. Dependent/predictor variables included duration of follow up, death/censoring, age, marital status, socio-economic status, histological

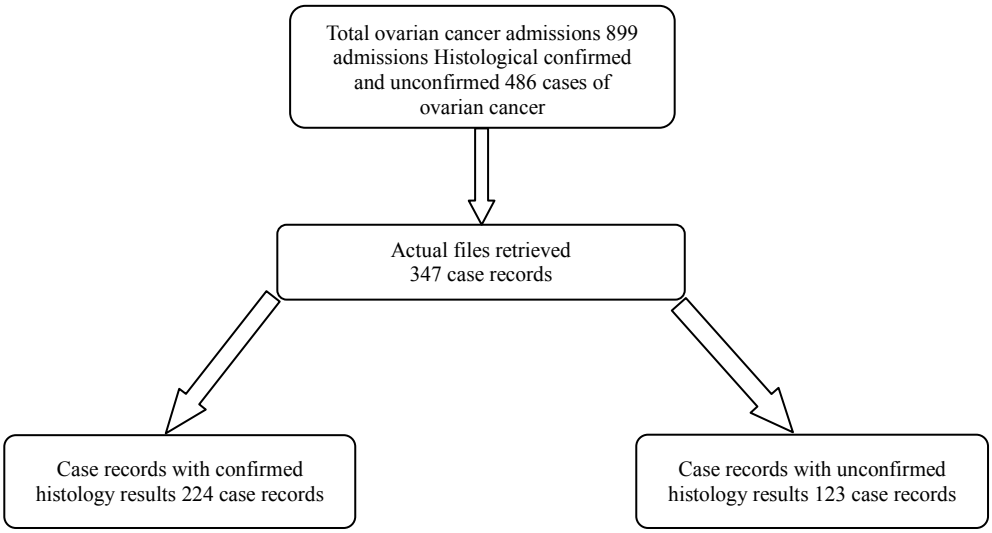

Figure 1. Study profile and flow of the sampling procedure.

types and therapeutic outcome.

Cases were defined as all cancer of the ovary patient's with histologically confirmed ovarian cancer dating between 1998 and 2008. The date on the pathology report was taken as the entry point. Cases were censored at death related to cancer of the ovary. For patients where death was not indicated in the case record, confirmation that the patient was dead and that the death was related to cancer of the ovary was done by contacting the family or next of kin using information in the case record (as determined from a death certificate or verbal autopsy) while loss to follow up defined as the date last seen for follow-up.

2.6. Data Analysis and Results

Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) Version 17. Descriptive results are reported and missing data quantified with respect to outcome (dead/alive) for all patient demographic, histological and treatment factors. The median and inter-quartile range will be reported for age. All independent variables are presented stratified by outcome and absolute counts and proportions are reported. Further, an association between the various explanatory factors and outcome has been assessed using a chi square test and p value has been reported.Two year survival trends were generated using Kaplan Meier method.

2.7. Ethical Considerations

Scientific and ethical approval for the study was obtained from the Kenyatta National Hospital/University of Nairobi Ethical Review Committee. Although the case records from which data were abstracted had names, data collected were de-identified and unique study patient identifiers created. This study was classified as audit and therefore informed consent from the participants was not found necessary by the institutional ethics reviews committee.

3. RESULTS

Descriptive Results

The mean (standard deviation) of the participants was 49.8 (15.7) years. At-least half of the women had primary education while (2%) had tertiary education. 58% (131) were married and about a fifth were still single. The mean age at menarche was 14.6 (1.8) years while that at menopause was 49.6 (5.1) years. Majority of the women 65% had more than one child. Although history of current family planning use was poorly documented with about only half of the data reported, of these only 44/114 (20%) had information indicating family planning method used previously. Overall there were no significant differences in the patient demographics between those who died and those who survived see **Table 1**.

Epithelial tumors were the commonest type of ovarian cancer, with 193 (86%) being confirmed to be of this type and the least being sex cord tumors at 3 (1%). Most of the patients 81 (36%) were at stage IV at the time of diagnosis; however about a third of the patients did not have a clinical staging documented. Further there was no significant differences between those who died compared to those who survived by staging and histological type, see **Table 2**.

Of the therapeutic options available chemotherapy was the most commonly used 103 (46%), followed by surgery 41 (18%) and a combination of both at 29 (13%). Radiotherapy was rarely used either alone or in combination with other treatments at 5 (2%) and 3 (1%) respectively. However about a fifth of the patients did not have the treatment option documented. Other treatment options are as shown in **Table 3** below.

From the Kaplan-Meier time survival estimate above, survival at 2 yr from diagnosis was 0.58 which corresponded with the median follow up period while survival at 5 yr was 0.20, see **Figure 2**.

4. DISCUSSION

Consistent with findings from other studies in developing countries, epithelial tumors comprised the majority 193 (86.2%) of the histological types at KNH [3,5,6]. Majority of the patients presented very late in stage IV, less than half (41%) of the patients underwent cytoreductive surgery and the two year survival is less than 60%.

Although there have been an increased number of cases over the last 10 years, this may suggest an improvement of increased awareness and diagnostics. However, a true increase in keeping with trends in the developed world cannot be ruled out [7-9].

Late diagnosis of the disease in this population can partly be attributed to poor health seeking behaviors due to the low socio-economic status, and low level of education of the study participants [4]. Poor overall prognosis can be explained by poor accessibility and affordability of management of cancer of the ovary which is all borne by the patient in KNH. Chemotherapy for treating cancer of the ovary is very costly and unlike the developed countries, in resource limited setting this care is usually not subsidized by Governments. Lack of a Gynaecology Oncology unit and enough trained Gynecologic Oncologist (only 2) in KNH adds to the overall inadequate care. Further high level (level IV and V) hospitals in Kenya have limited capacity to provide cancer care: the absence of staff (nurses and doctors) with specific oncology training, lack of equipment required for screening leave hospitals without human resources with

Table 1. Descriptive demographic statistics.

	Died n (%)	Survived n (%)	Overall n (%)	Degrees of freedom	chi^2	p value
Age at diagnosis‡					−0.86	0.393
Mean (SD)	48.2 (15.8)	50.1 (15.7)	49.5 (15.7)			
Education						
Primary	37 (55)	82 (52)	119 (53)	4	1.48	0.831
Secondary	11 (16)	31 (20)	42 (19)			
Tertiary	2 (3)	2 (1)	4 (2)			
Others	7 (10)	14 (9)	21 (9)			
Not indicated	10 (15)	28 (18)	38 (17)			
Marital status						
Single	13 (19)	29 (18)	42 (19)	4	0.17	0.997
Married	38 (57)	93 (59)	131 (58)			
Divorced/separated	5 (7)	10 (6)	15 (7)			
Widowed	8 (12)	18 (11)	26 (12)			
Not indicated	3 (4)	7 (4)	10 (4)			
Employment						
Employed	6 (9)	14 (9)	20 (9)	3	4.51	0.211
Self employed	11 (16)	34 (22)	45 (20)			
Unemployed	46 (69)	107 (68)	153 (68)			
Not indicated	4 (6)	2 (1)	6 (3)			
Parity						
1	3 (4)	12 (8)	15 (7)	4	3.89	0.421
2 to 3	17 (25)	37 (24)	54 (24)			
4 to 5	15 (22)	43 (27)	58 (26)			
5 plus	8 (12)	26 (17)	34 (15)			
Not indicated	24 (36)	39 (25)	63 (28)			
Family planning use						
Yes	10 (15)	34 (22)	44 (20)	2	2.47	0.291
No	19 (28)	51 (32)	70 (31)			
Not indicated	38 (57)	72 (46)	110 (49)			
Menarche‡						
Mean (SD)	14.6 (2.3)	14.6 (1.5)	14.6 (1.8)		−0.154	0.878
Menopause‡						
Mean (SD)	48.3 (4.8)	50.1 (5.2)	49.6 (5.1)		−1.25	0.216

‡Students t-test for comparison of means.

Table 2. Histology type and tumor distribution by mortality.

	Died n (%)	Survived n (%)	Overall n (%)	Degrees of freedom	chi^2	p value
Histology type						
Epithelial tumor	57 (85)	136 (87)	193 (86)	3	0.27	0.966
Germ cell tumors	5 (7)	9 (6)	14 (6)			
Sex cord tumors	1 (1)	2 (1)	3 (1)			
Rare tumors	4 (6)	10 (6)	14 (6)			
Stage at diagnosis						
Stage I	13 (19)	18 (11)	31 (14)	3	7.69	0.053
Stage II	5 (7)	13 (8)	18 (8)			
Stage III	12 (18)	11 (7)	23 (10)			
Stage IV	20 (30)	61 (39)	81 (36)			
Not indicated	17 (25)	54 (34)	71 (32)			

Table 3. Therapeutic options for ovarian cancer by mortality.

	Died n (%)	Survived n (%)	Overall n (%)	Degrees of freedom	chi^2	p value
Therapeutic options						
Surgery	10 (15)	31 (20)	41 (18)	6	3.92	0.687
Chemotherapy	37 (55)	66 (42)	103 (46)			
Radiotherapy	1 (1)	4 (3)	5 (2)			
Surgery and Chemotherapy	6 (9)	23 (15)	29 (13)			
Surgery and Radiotherapy	1 (1)	2 (1)	3 (1)			
Surgery, Chemo, Radiotherapy	1 (1)	2 (1)	3 (1)			
Not indicated	11 (16)	29 (18)	40 (18)			

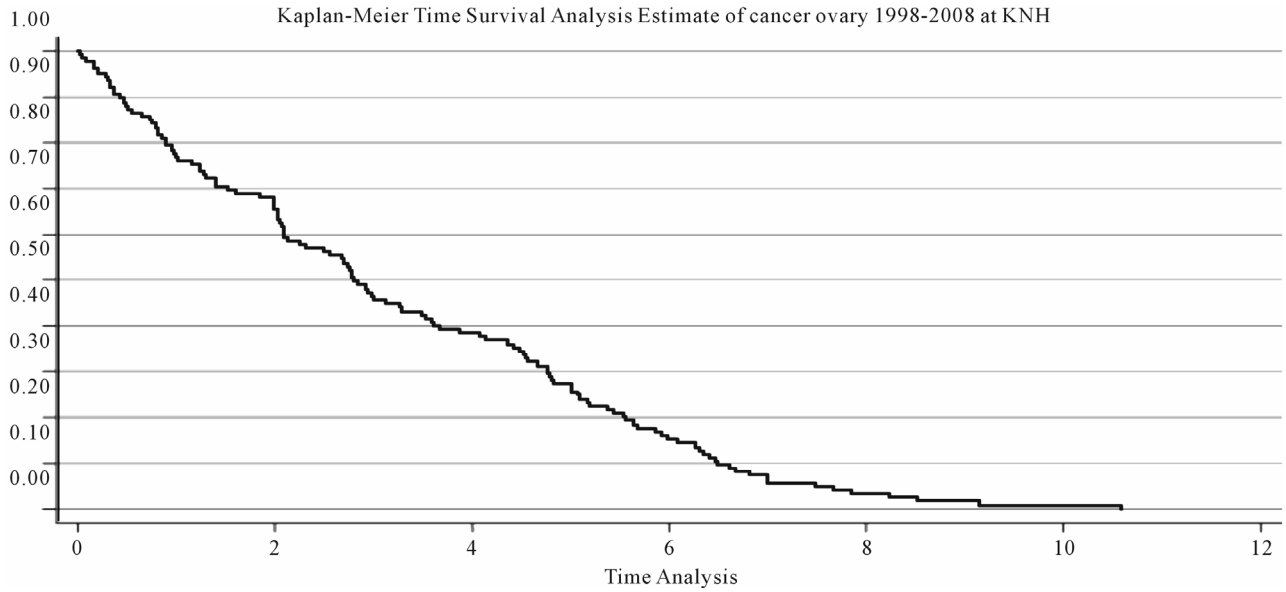

Figure 2. Survival analysis for the entire study period.

appropriate skills to manage cancer patients, leading to late identification, late referral to KNH the only other referral oncology centre and escalated costs with a poor prognosis for these patient groups.

The poor documentation of key predictors of ovarian cancer demonstrated by a high percentage of missing data, poses a challenge to patient management and follow-up. This is largely because KNH lacks standardized Gynecologic Oncology encounter forms and is still paper based, unlike cancer centers in developed countries that have electronic data bases and robust national cancer registries. This highlights the need for data collection strategies and integration of oncology care with other support services (pathology, laboratory, radiology and radiotherapy) within the hospital [5].

Although the data we present is descriptive it provides an insight in the care for ovarian cancer patients in Kenya. Data of this type is rarely reported and we suspect, but cannot confirm, that data from Kenya may be indicative of problems present much more widely in low-income African settings given reports of limited data on non-communicable diseases in the region. Our data show poor documentation on ovarian cancer care similar to other diseases, is one of the major challenges to evaluating outcomes and quality of care which is essential to understanding health system performance [10,11].

5. CONCLUSION

This study has demonstrated the need to improve the quality of data on cancer care and information systems in general to provide a reliable source of information to guide patient care, research and policy in oncology. Further, the late presentation to hospital calls for innovative strategies to improve ovarian cancer awareness and uptake of screening tests. There is need to lobby Governments in resource limited setting to subsidize cancer of the ovary care and invest in lower level health facilities to promote early diagnosis and decongest the referral hospital. More studies are needed to design cost-effective screening for cancer of the ovary, ways of increasing awareness of this cancer and training of Gynecologic Oncologists.

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7. CONTRIBUTIONS

The idea for the study and its design were conceived by Eunice Cheserem (EC), with advice from Anne Kihara (AK) and Stephen Gichuhi (SG) who was her supervisor. UNITID-University of Nairobi partially funded this project. Jeldah Mokeira was responsible for data collection, and data entry. David Gathara (DG) Julius Mwangi (JM) and EC were responsible for data analyses. EC DG and Rose Kosgei (RK) prepared the initial draft manuscript. All authors reviewed the draft manuscript and provided input to and approval for the final version of the report.

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