RESEARCH COMMUNICATION

Survival of Ovarian Cancer in Iran: 2000-2004

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Abstract

Objective: The aim of this study was to estimate the 5-year survival of ovarian cancer in Iran between 2000 and 2004, according to age and histology. Methods: Cancer registry of Iran, 2000-2004, was used covering nearly 80% of all ovarian cancers and 100% of all pathologically diagnosed ovarian cancers. Results: Of 1,246 new ovarian cancer cases, 451 were available for further follow-up which revealed 169 deaths and 282 live cases. The 5-year survival was 61%; 85% for germ cell tumors and 59% for epithelial tumors. Survival of serous, mucinous, endometrioid and clear cell histologic subtypes of epithelial tumors was 41%, 62%, 76% and 78%, respectively. Young patients with epithelial tumors (below 45) displayed significantly better 5-year survival rates (63% versus 53%). Conclusion: we found that ovarian cancer had a better survival rate in Iran in comparison to other regions. We also reviewed all probable confounding factors or real causes. In this study, age and histology affected survival.

Key Words: Ovarian cancer - survival - Iran - histology - age at diagnosis

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Introduction

Ovarian cancer is common in the world and is the 4th to 7th most frequent cancer in females (Sen et al., 2002; Laurvick et al., 2003; Bray et al., 2005; Ministry of Health and Medical Education, 2005; Skirnisdottir et al., 2008; Mohagheghi et al., 2009). Ovarian cancer is the leading cause of death from a gynecologic malignancy (Schiff et al.,1996; Australian Institute of Health and Welfare, 2001; Quirk et al., 2005) .Therefore ovarian cancer is of public health importance (Laurvick et al., 2003). In Iran, ovarian cancer is the 8th most frequent for incidence and 12th for mortality and 16th in burden of cancer (Akbari et al.,2008).

Ovarian cancer survival depends on many factors including stage, grade, histology, age, proper surgical treatment, proper chemotherapy, living location, medical co-morbidity and residue of tumor (Hanai et al.,1990; Berek et al., 2005; Hoskins et al., 2005; Berek et al., 2007; Disaia et al.,2007; Hannibal et al., 2008; Rock et al., 2008). The survival, based on population-based cancer registries, is essentially different from the survivals of the cancer patients diagnosed and treated at specific facilities and departments. It is a prerequisite for designing projects and the evaluation of measures and treatments for cancers, because only the former is capable of providing patients data without bias (Tsukuma et al., 2006).

However, in Iran, ovarian cancer survival has not been calculated hitherto, to our knowledge. In this study, we used pathology–based cancer registry data of Islamic Republic of Iran between 2000 and 2004. The aim was to estimate the 5-year survival rate of ovarian cancer patients according to age and histology.

Materials and Methods

Cancer registry data of health administration of Islamic republic of Iran, between 2000 and 2004 was used (Ministry of Health and Medical Education, 2005). Data was actively collected from all pathology centers of the country. Hospital-based and death certificate-based data were not included. It was estimated that available data covered 80% of cancer cases.

Forty five different histologic reports of ovarian malignancies were reported in 1246 new cases in this period of time. In the present study, we classified them in 10 main clusters (Berg et al., 1996; Scully et al., 1999; Guirk et al., 2005) as follows: all ovarian, adenocarcinoma, serous, mucinous, endomertioid, clear cell, adenocarcinoma (others), sex- cord stromal, Germ cell and other ovarian. Four hundred and fifty one cases out of 1,246 were available for follow-up. Active follow-

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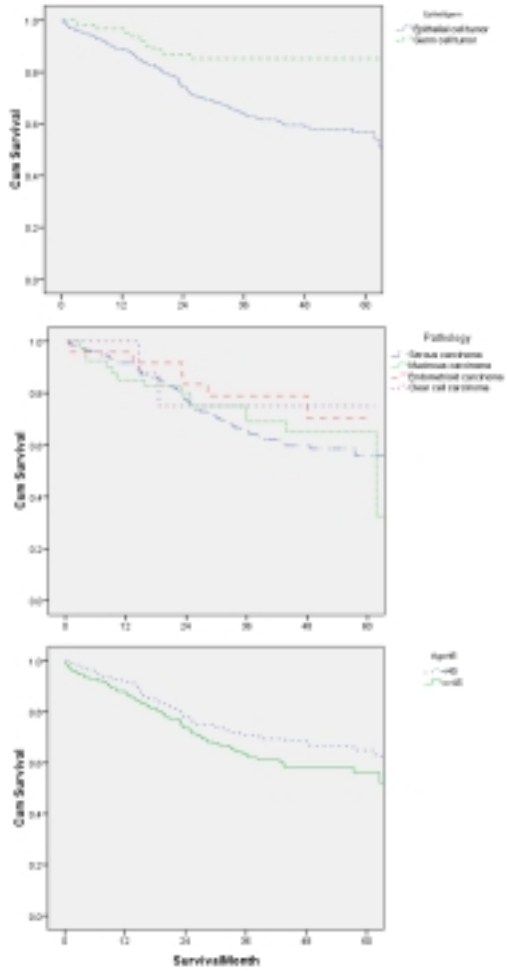

Figure 1. Comparison of Survival in Patients with Ovarian Neoplams, Iran, 2000-2004. a) Epithelial and germ cell tumors; b) serous, mucinous, endometrioid and clear cell histologic subgroups of epithelial tumours; and young (below 45 years of age) and old (older than 45) age groups

up of patients, based on their phone number and address, was done. Duration of follow-up was calculated from the date of diagnosis to the data of death. Patients were censored after 30 September 2008 if they were alive.

The Kaplan-Meier method was used to estimate overall survival and survival according to age and histology. Differences between survival curves were evaluated by log rank test. Statistical significance was defined by a p value < 0.05. Statistical computing was performed using SPSS.

Results

Four hundred and fifty one (451) were available for further follow-up which revealed 169 deaths and 282 live patients. Mean age of patients was 46.6 years old (SD + 17.08). Most of the cases were younger than 45 years of age.The five-year survival of all ovarian cancer patients was 61% and five-year survival rates of two main ovarian cancer groups, epithelial and germ cell tumors, were compared.

The five-year survival rate of germ cell tumors and epithelial tumors was 85% and 59%, respectively ($p< 0.05$) (Figure 1a). Therefore, epithelial ovarian cancers revealed a worse prognosis in comparison to germ cell tumors and the difference was significant.

In epithelial ovarian cancer, the most common ovarian cancer, 5-year survival of some histologic subtypes i.e. serous, mucinous, endometrioid and clear cell were 41%, 62%, 76%, and 78%, respectively (Figure 1 b). In epithelial ovarian cancers below 45 years of age, cases displayed a significantly better 5-year survival rate (63%) in comparison to those older than 45 (53%) (Figure 1c). Mean survival of the young age group (< 45) and the old age group (> 45) was 119.9 and 46.2 months, respectively.

Discussion

The five-year survival rate of all ovarian cancers in Iran between 2000 and 2004 was 61%. This compares well with one population-based study in Japan, where the figure was 43.8% (Tsukuma et al, 2006). In another Japanese study the rate was 36.4 (Loka et al ,2003)and a trend of improved 5-years survival to a range of 25-41% in the second half of the 1970s was reported (Hanai et al.,1990). Survival at five years was only 34% in one Australian study, which was similar to reports from other Australian states (Baade et al., 2000; Coutes et al., 2000; South Australian cancer registry, 2000). However, a study in U.S reported the highest 5-year survival (52%). In US Epidemiology and End Results (SEER) program, they included borderline malignant neoplasms in their analysis (Ries et al., 2001). Without these the overall survival in the US would be reduced considerably (Laurvick et al., 2003).

In a population-based study on Californian women including women who had received surgical treatment and were candidates for adjuvant chemotherapy with exclusion of borderline tumors, 5-year survival was 33% (O Malley et al,2003). Results of North Californian women survival was compared to San Francisco region displaying a 2.6 time higher hazard ratio in the same study. Better survival in San Francisco was due to their younger population, more aggressive surgery due to less co-morbidity and more frequent chemotherapy (O'Malley et al., 2003). It may be the case in the better 5-year survival rate found in Iran (61%) in comparison to Australia, Japan and US. Many late stage ovarian cases, especially in the elderly, may have been excluded from our pathology – based data, because of just being reported as an undiagnosed end-stage disease in hospital admissions or death certificate data.

Therefore, undiagnosed late stage ovarian cancer deaths shift our ovarian cancer population towards earlier stages and younger people with a better survival; however, it should be mentioned that Asians have significantly higher estimates of survival than any other racial / ethnic groups (O'Malley et al,2003). Regional variation was previously reported in a study of U.S. mortality trends, in which the authors suggested that the decreased survival in the northern states might have been explained by different reproductive practices, different health services, or Northern European ancestry (Oriel et al,1999). Regional differences were also reported in a Eurocare study of 17 European countries, with women in Eastern European countries having markedly decreased survival rates. (Gata

et al,1998)

Regarding epithelial ovarian cancer, as the most common type of ovarian cancer (Berek et al, 2007; Hoskins et al, 2005; Berek et al, 2005; Disaia et al, 2007) , the 5-year survival was 59% in the present study. In the present study, 5-year survival rate of the serous subtype was the worst (41%) while endometroid and clear cell had better 5-year survival rates (61% and 76%, respectively). The impact of histology on survival is inconclusive in the published literature (De Souza et al.,1992; Averette et al., 1993; Markman et al.,1993; Vergote et al.,1993; Makar et al.,1995; Bjorge et al.,1998; Balli et al., 2000; Scholz et al., 2001; McGuire et al., 2002). In the Californian study, only clear cell histology differed significantly from the reference group of endometrioid histology (O'Malley et al., 2003). In a study in New Mexico including American Indian, Hispanic and non-Hispanic white women, an improvement of 5-year survival was shown comparing early (1969-82) with late (1983-92) period in clear cell (64% versus 71%), and endometrioid carcinoma (55.9% versus 73%) (Schiff et al., 1996). In a west Australian study, among epithelial ovarian tumors, those with endometrioid (55.4%) had the highest 5-year survival, followed by those with clear cell (50.9%) and mucinous tumors (46.3%). Women with serous tumors had the worst 5-year survival (30.3%) (Laurvick et al., 2003) In a Japanese study, mucinous carcinoma showed a better survival than serous (59% and 38.5%) (Loka et al., 2003). In the aforementioned and also some other studies including ours, patients with mucinous and endometrioid carcinoma showed an overall better survival in comparison to serous types. These findings may reflect the rarity with which high-grade and advanced stage mucinous and endometrioid carcinomas are diagnosed (Berek et al., 2005). Some analyses have suggested that ovarian clear cell adenocarcinoma maybe more aggressive than the other common epithelial malignancies on a stage- for-stage basis.(Petterson et al,1988). In a literature review of nearly 400 cases of clear cell tumor, the 5-year survival for stage 1 was 60% and 12% for all other stages. In fact, it indicated higher degrees of uniformity when stratified by stage and grade (Heintz et al., 2003).

Germ cell tumors revealed a better 5-year survival in the present study in comparison to epithelial tumors (85% versus 59%). Many other studies in the literature confirm the better survival of germ cell tumors compared with epithelial tumors (Schiff et al, 1996; Laurvick et al ,2003;Loka et al,2003) with a 5-year survival range similar to our study, 92.8% in west Australia and 82.8% in New Mexico. Younger age of germ cell tumor patients and response to chemotherapy may explain the much better survival in germ cell versus epithelial tumors. In a study in Japan with a survival of 58.3% for germ cell and 37% for epithelial tumors, stage distribution of the advanced stage was 16.9% for germ cell and 26.6% for epithelial tumors. (Loka et al,2003). More patients with advanced stages of epithelial tumors may explain its worse survival in comparison with germ cell tumors.

In the present study, younger patients (below 45) displayed a better survival in line with earlier many studies (Van Houwelingen et al.,1989; Voest et al.,1989; Omura et al.,1991,Markman et al., 1993; Schiff et al.,1996; Laurvick et al., 2003; O'Malley et al., 2003; Berek et al., 2007; Hannibal et al.,2008). The better survival in the younger epithelial ovarian cancer patients may be due to more aggressive debulking because they do not have medical co-morbidities. Others have reported that elderly women are given less chemotherapy or are less likely to be placed on intensive experimental regimens (Thigpen et al, 1993)

In conclusion, ovarian cancer survival in Iran was 61% in this study and a better survival is seen in younger people and some histologic subtypes. There may be major regional differences in survival. By focusing on stage, treatment status and other important factors in the future, ovarian cancer survival studies in Iran would more strongly direct public programs toward improving the survival of ovarian cancer in Iran.

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