RESEARCH ARTICLE

Comparison of Crude and Age-Specific Incidence Rates of Breast, Ovary, Endometrium and Cervix Cancers in Iran, 2005

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Abstract

Background: Cancer accounts for 12.6% of total deaths in the world (just after heart disease). Materials and Methods: Frequency and age-specific incidence rates of breast and gynecologic cancers in Iran are calculated based on the dataset of the National Cancer Registry of Iran in 2005. Results: Gynecologic and breast cancer accounted for 7.6% and 25.6% of total cancer cases, respectively. Ovarian cancer was the most frequent gynecologic cancer followed by endometrium. Endometrial cancer revealed the highest age specific incidence rate followed by ovary (after 59 years). Conclusions: Regarding disease burden, breast and gynecologic cases account for 33.4% of total cancer patients. The age specific incidence rate is a useful guide in epidemiologic and future plans.

Keywords: Ovarian cancer - cervical cancer - endometrial cancer - gynecologic cancer - Iran

Asian Pac J Cancer Prev, **15 (6)**, 2461-2464

Introduction

In review of data report of the GLOBOCAN 2012, older age of population might lead to an increase toward 19.3 million new cancer cases per year by 2025. Most of the cancer cases (56.8%) and its mortality (64.9%) happened in developing countries of the world, with an expected acceleration by 2025 (GLOBOCAN, 2012). Death due to cancer in the world accounts for 12.6% of total deaths, just second after heart disease . It is expected that cancer deaths exceed heart disease mortality, which is the most common cause of death (organization, 2007). In developed countries the most common cause of mortality is cancer, accounting for 26.6% of total deaths (society, 2011).

Although increasing incidence is observed in most countries of the world, there is significant imbalance between developed and developing countries. Developed countries exhibit the highest incidence rate while cancer death is pretty higher in developing countries. Regarding the cause of observed discrepancy, lower resource in developing countries resulting in later diagnosis and less management facilities. For instance, women breast cancer incidence is equal to 90 new cases per 100 000 yearly, in Western Europe, in comparison with 30 per 100 000 in eastern Africa, while the mortality rates in these two regions are nearly equal to 15 per 100 000 (WHO, 2013).

Mortality due to breast, cervical and ovarian cancer in the world is equal to 26.1% of total female cancer death (Ferlay et al., 2010). All over the world cancer of breast, cervix, uterus and ovary account for 40% of female cancers (Parkin, 2005, Day et al., 2010). Uterine cancer accounts for 6% of all female cancers followed by ovarian cancer which is the most common cause of gynecologic cancer mortality (Jemal et al., 2006). Cervical cancer has decreased by 75% over the past five decades in highly developed countries, and in less developed counties, cervical cancer is the second common etiology of death (Ferlay et al., 2010, 2002). In a study in Spain, breast cancer was the most common etiology of cancer death among women, accounting for 5939 deaths in 2006. In the same study uterus, cervix and ovary accounted for 30% of total deaths (Cabanes et al., 2009). Death due to these tumors (breast, ovary and uterus) is lower in other countries in comparison to Europe (WHO, 2009). A study in Kengatta national hospital of Nairobi revealed that 46% of mortality was due to gynecologic malignancy, mostly cervical cancer (Rogo, 1989).

In briefly ranking the world estimated female death of breast, uterus, ovary and cervical cancers in the world, breast is in the top list followed by cervix, ovary and uterus. In developed countries breast death rate is followed by ovary, uterus and cervix. In developing countries, breast cancer death rate is followed by cervix, ovary and uterus (Jemal et al., 2011).

The future of gynecologic oncology is exposed to better life expectancy and more old age people, and the increase in breast cancer incidence, and the expected burden of other malignancies is probably under the influence of multiple factors, for example, western

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lifestyles, smoking, new habits in diet, degree of physical activity, and reproduction status (Baltzer, 2008, Momtahen et al., 2009). Infertility results are an increase in breast and ovarian cancer incidence in the infertile population (Jensen et al., 2008, Tworoger et al., 2007).

Cervical cancer is the second common gynecologic cancer in the world (Parkin et al., 2005). Socio- economic and screening methods play a role in cervical cancer prevention. Incidence of cervical cancer in Africa is high and in sub-Saharan Africa it is the most common female cancer (Hovland et al., 2010). In developed and western countries, cervical cancer trend is downward due to usage of cytology for prevention (Bray et al., 2005). Analysis of 45 studies from 21 countries revealed that oral contraception usage resulted in risk reduction of ovarian cancer (Beral et al., 2008).

Common, well known risk factor for breast, ovarian and endometrial cancer is nulliparity (Bernstein, 2002, Modugno et al., 2001, Garland et al., 1998, Akhmedkhanov et al., 2001, Key et al., 2001, Hankinson et al., 1995). This study is to determine frequency of breast and main gynecologic cancers including ovary, endometrium and cervix in Iran. Age specific incidence rate (ASR) of the above mentioned cancers is calculated, as well.

Materials and Methods

Based on data set of the National Cancer registry of Iran, 2005, published by the ministry of health, all new female cancer patients were reviewed. Frequency of breast and gynecologic cancers are extracted and the ratio of gynecologic cancers among all site female cancers was calculated. Frequency of female cancer patient including breast, cervix, ovary, endometrium, Uterus (NOS), vulva, vagina, placenta and other female genital organs were reviewed. In this step frequency of breast and gynecologic cancers in different age groups were computed.

In the second step, age- specific incidence rate of breast and the main three gynecologic cancers (ovary, endometrium and cervix) were calculated and compared. Since the other gynecologic cancers were rare, their crude incidence rates were not included in the study.

Results

In 2005, 24498 new cancer cases were reported in female population of Iran. Crude incidence rate was 71.42 per 100.000 women. Gynecologic cancer cases accounted for 1923 cases (7.8%) and breast cancer for 6265 cases (25.6%) (Table 1). Ovary with 793 new cases (41.2%) was the most common gynecologic cancer site among women. Endometrial cancer, non specified uterine cancer and cervical cancer were reported in 26%, 3% and 22.3%, respectively.

Among 1923 cases of gynecologic cancer in women, the most frequent age group was 50-59 accounting for 427 cases (24.5%) followed by 40-49 age group (20.9%) and 60-69 (20.1%) , (Figure 1).

Contribution of gynecologic and breast cancer among total female cancer cases in 2005 according to age groups are shown in Figure 2.

Table 1. frequency of Different Gynecologic and Breast Cancer Cases in Iran, 2005

Site	Frequency	% among all female cancers	% among all gynecologic cancer
Ovary	793	3.2	41.2
Endometrium	500	2	26
Uterus, NOS	55	0.2	2.9
Cervix	428	1.7	22.3
Vagina	53	0.2	2.8
Vulva	47	0.2	2.4
Other female genital organ	14	0.1	0.7
placenta	33	0.1	1.7
Female gynecologic cancer	1923	7.8	100
Breast	6265	25.6	
Other female cancer	16310	66.6	
All site female cancer	24498	100	

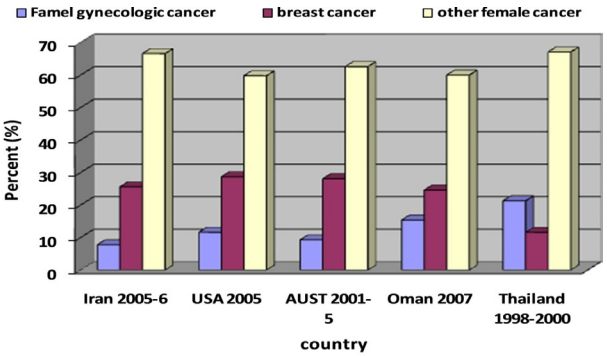

Figure 1. Frequency Distribution of Gynecologic Cancer Cases According to Age in Iran, 2005.

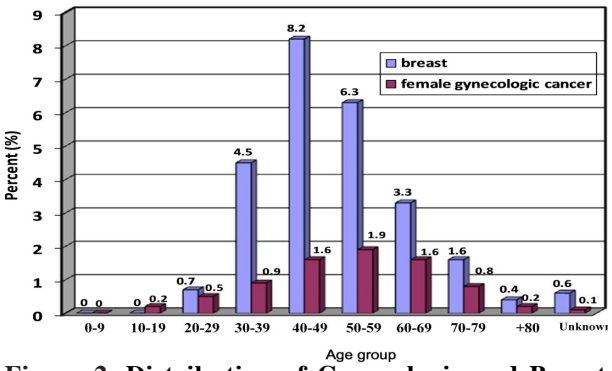

Figure 2. Distribution of Gynecologic and Breast Cancer Cases among Total Female Cancers According to Age, in Iran, 2005

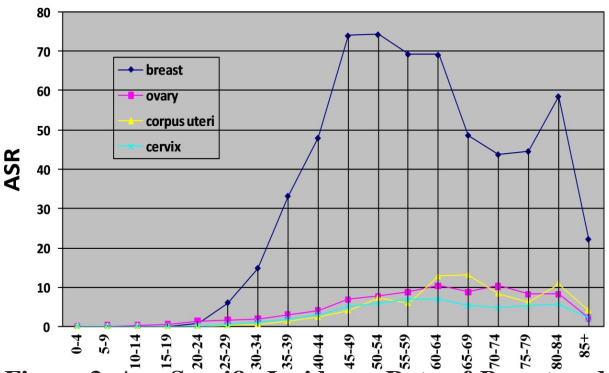

Figure 3. Age-Specific Incidence Rate of Breast and Main Gynecologic Cancers per 100.000, in Iran, 2005.

Table 2. Age-Specific Incidence Rate of Breast and Gynecologic Cancers in Iran, 2005

Age group	Breast	Ovary	Corpus uteri	Cervix uteri
0-4	0	0	0	0
5-9	0	0.1	0	0
10-14	0	0.3	0	0
15-19	0	0.6	0	0
20-24	0.8	1.3	0.1	0.1
25-29	5.9	1.5	0.2	0.4
30-34	14.7	1.9	0.5	1.1
35-39	33.1	2.8	1.4	1.9
40-44	47.9	3.9	2.3	3
45-49	74	6.8	4	4.9
50-54	74.3	7.7	7.2	5.8
55-59	69.3	8.6	5.9	6.7
60-64	69.1	10.3	12.7	6.8
65-69	48.6	8.7	13.1	5.2
70-74	43.7	10.2	8.3	4.6
75-79	44.5	8.2	6.2	5.2
80-84	58.5	8.1	10.8	5.4
85+	22.1	2	4	2
Total	17.4	2.3	1.6	1.4

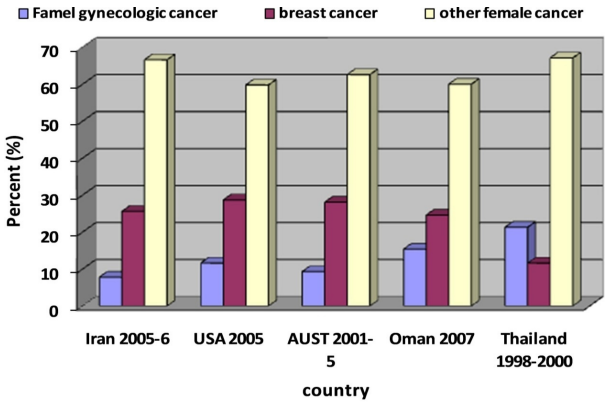

Figure 4. Comparison of Gynecologic and Breast Cancer Frequency between Iran and 4 Countries. *United states department of health and human services, 2008, Welfare, 2007, Mohammad A et al., Khuhaprema et al., 2007

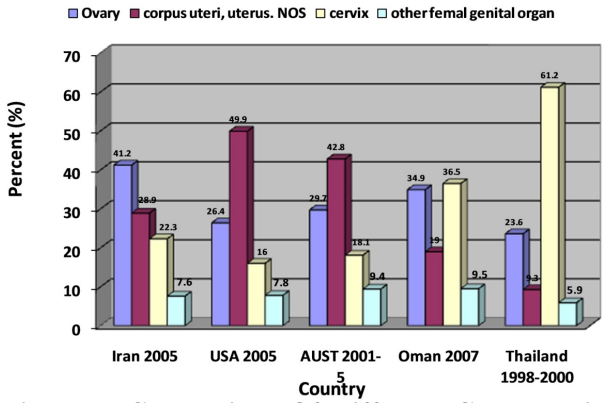

Figure 5. Comparison Of Different Gynecologic Cancers Including Ovary, Uterus And Cervix Between Iran And 4 Countries

Age specific Incidence rate of gynecologic and Breast cancers are reported in Figure 3 and Table 2.

Breast cancer incidence rate in the age of 20 is 0.8 per 100.000 with increasing rate toward the peak of 45-49 and 50-54 age groups (74.3 per 100.000). A little decrease in the age groups of 55-59 and 60-64 is observed with a platue of 69 per 100.000 followed by a steep decrease toward 43.7 in age group of 70-74, the peak is repeated in 80-84 (58.5 per 100.000). Finally very fast decrease to 22.1 per 100.000 in the age of 85 and above is observed.

In Iran, gynecologic cancers account for 7.8% and breast cancer for 25.6% of all female cancer cases. Comparison of gynecologic and breast cancer contribution in Iran with those of USA, Australia, Oman and Thailand is presented in Figure 4.

Discussion

Maximum age specific incidence rate belong to breast cancer, followed by ovary, endometrium and cervix in all age groups, except of 60-69 and 80-84 age groups. In these age groups, ranking change in favor of the highest rate for endometrium, followed by ovary and cervix, is observed (Figure 3 and Table 2).

Summarizing the world ranking of new cancer cases in breast and gynecologic cancers including uterus, ovary and cervix, the highest rate in female population in 2008 belongs to breast followed by cervix, uterus and ovary. In developed countries breast cancer is followed by uterus, ovary and cervix. In developing countries breast cancer is followed by cervix, uterus and ovary (Jemal et al., 2011).

Gynecologic cancer cases account for 7.8% of total female cancers In Iran. Contribution of gynecologic cancer patients in USA, Australia, Oman and Thailand are 11.6%, 9.3%, 15.4% and 21.3%, respectively as presented in figure 4 (United states department of health and human services, 2008, Mohammad et al., Khuhaprema et al., 2007; Welfare, 2007). These findings are the result of many different causes including risk factors and protective parameters of each gynecologic cancer in that society.

The most three common gynecologic cancers in Iran are ranked as ovary (first), followed by uterus and cervix (table 1). Comparison of the three main gynecologic cancers between Iran, USA, Australia, Oman and Thailand are presented in Figure 4.

The most common gynecologic cancer in USA and Australia is Uterus, in Oman and Thailand is cervix and in Iran is ovary. Many factors are effective in causing a cancer to be more prevalent. The present comparison is just useful to determine disease burden in an area such as Iran which ovary is the most common gynecologic cancer. The cause is related to risk and protective factors of ovarian cancer. For instance diet, obesity, white race, nulliparity and infertility are main risk factors for ovarian cancer (Arab et al., 2010). Multiparity, breast feeding and oral contraceptive use are important protective factors (Holschneider and Berek, 2000). Undoubtedly if the frequency of one gynecologic cancer is changed, other cancers rank different in relation to each other.

In Thailand, probable cause of first rank for cervical cancer could be reviewed. The human papilloma virus (HPV) as a necessary carcinogen in the process of cervical cancer development causes this cancer to be mentioned as a sexually transmitted disease (Walboomers et al., 1999). Early sexual exposure, multi partners, multiparity, smoking and low socioeconomic status are

the main factors of cervical cancer incidence in the society (Haverkos et al., 2003, registry, 2007). Endometrial cancer which is the first rank in USA and Australia might be due to more obesity and lifestyle in these regions.

Most frequent age group for gynecologic and breast cancer in Iran is 40-59 which accounts for 18% of total patients (Figure 2). Age specific incidence rate of breast cancer is highest in 45-54 age group (Table 2 and Figure 3). Review of age specific cancer incidence rate after 59 years in Iran, revealed endometrium as the most common cancer followed by cervix. Frequency data presented ovary as the most frequent gynecologic cancer of Iranian women followed by endometrium. The roles of adjusting frequency by age and population distribution confirm the importance of age specific incidence rate in epidemiologic aspects and future health planning. Frequency of disease and cancer in this case determine disease burden.

In conclusion, Gynecologic and breast cancer cases account for 7.8% and 25.6% of total female cancers in Iran, respectively which are lower in comparison with those of some other countries. The most frequent studied cancers in Iran (2005) are breast, ovary, endometrium and cervix. Adjusting with age revealed the same results except of 60-69 and 80-84 age groups in which the rank of age specific incidence rate in endometrium exceeded ovary. In order to compare the trend of gynecological cancer between Iran and other countries further studies might help more.

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