

RESEARCH ARTICLE

Prevalence of Types of Cancers in the Elderly Covered by Insurance of the Islamic Republic of Iran Broadcasting Company in 2015 - Comparison with Younger Groups

Zahra Roshani, Ahmad Ali Akbari Kamrani*, Mohsen Shati, Robab Sahaf

Abstract

Presently, the world population of the elderly is growing. By improving health hygiene and welfare indicators, mortality and birth rates decrease and life expectancy increases, making the present century the century of elderly. Aging is one of the main risk factors for development of cancer, which itself is the second cause of death in old people. This study was conducted to assess the prevalence of cancer in the elderly covered by the Islamic Republic of Iran Broadcasting (IRIB) insurance program and to obtain suitable programs for cancer screening and early detection, increase patient survival, improve elderly care and to reclaim the cost of treatment in comparison to the national and international statistics. This is a cross-sectional study conducted on all elderly patients diagnosed with malignancy based on their pathology reports. In this study, of the total 75,500 patients covered by IRIB insurance, 17.2% belonged to the elderly group, males accounting for 53.3%. The most common cancers in old men were prostatic cancer (61.3%), colon cancer (10.3%) cancer of the hematologic system, bladder cancer (9.6%), lung cancer (9.1%), thyroid cancer (3.9%) and brain tumors (1.3%). In the elderly women, the most common cancers were breast cancer (80.1%), colon cancer (5.1%), thyroid cancers (4.4%), bladder and hematologic system malignancies (3.6), lung cancer (2.9%) and brain tumors (0.7%). In addition, the prevalence of cancer was almost the same as national and international statistics. With the exception of non-melanoma skin cancer no difference was shown in prevalence of cancer between IRIB elderly patients and the other groups of cancer patients in Iran.

Keywords: Elderly age - cancer prevalence - IRIB insurance cover - comparison with younger groups

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Introduction

Cancer is a very complex disease induced by environmental and genetic factors (Lichtenstein et al., 2000). Environmental factors such as pollution, unsuitable diet, lack of physical activity, tobacco and alcohol consumption, infections and many other factors play key role in the incidence of cancer (Johnson et al., 2013). In terms of genetic, more than twelve various genes are involved in the cascade of the scenario for producing cancers (Noori Dalooi, 2009). In addition, the involved genes are different from one cancer to another. These genes play an important role in initiation, progression and end stages of the disease (Noori Dalooi, 2009). Like a cellular cycle of the diseases, a cancer is usually prevalent in older generation and is one of the most common causes of death in the elderly.

With increasing age, malignant variation occurs in cells due to genetic instability, unbalanced expression of gene, accumulation of randomized genetic mutations (which result in either the accelerated activity of oncogenesis or

decreased activity of prohibitive genes of tumor), as well as reduced repair of injured DNA (Dalooi et al., 2014).

Therefore, increasing age is the main risk factor for the development of cancer (Thakkar et al., 2014). According to the study conducted by Berger et. al, more than 60% of cancers have been diagnosed in individuals more than 65 years of age. Also, cancer is the cause of 70% of mortality in elderly population (Berger et al., 2006). Moosavi et al. has reported that higher frequency of cancer in Iran occurs in individuals older than 70-75 years of age (Mousavi et al., 2009). The rate of incidence of cancer in individuals aged 65 years and above is ten times higher in comparison to individuals lower than 65 years old and the death related cancer in patient above 65 years old is sixteen times more than younger patients (Berger et al., 2006). In addition, the prevalence of cancer can be different in the various communities and groups. According to the report by the World Health Organization (WHO), the most common diagnosed cancers in aged men are cancers of the lung, prostate, colorectal, gastric and liver; however, the most common diagnosed cancers in elderly women are cancers

of breast, colorectal, lung, cervix, and gastric, respectively (Cancer IAfRo, 2014).

Yang et. al, has indicated in their study the frequency of cancers of the lung, stomach, and colorectal in Japanese older men, and cancers of stomach and colorectal in Japanese older women (Yang et al., 2010). According to the study conducted by Chano Veng, the most common cancer in Chinese aged people is cancer of the lung and the gastrointestinal system (Wang et al., 2012). In Iran, based on the registered report from the Ministry of Health, Treatment and Medical Education, it has stated that prevalence of cancer increases along with increased age, the rate of incidence of cancer has been increased and the maximum age for developing cancer is between 80-84 years (National cancer Registry Report, 2009). The study conducted by Rafiee et al. showed that the most common cancers in elderly women are cancers of skin, breast, stomach, esophagus, colorectal, bladder, lymphoma, lung, ovarian, and leukemia; while, the most common cancers in elder men are skin, stomach, bladder, prostate, esophagus, colorectal, lung, lymphoma, leukemia, and thyroid cancers (Akbari et al., 2011), respectively. Diagnosis of cancer in the elderly imposes significant costs on patients and their family in addition to its physical and mental problems. This issue is very important in considering the report published by the National Bureau of American Economic Research in 2015 regarding the annual increase of at least 10% cost of anticancer medications from 1995 to 2013 (<http://healthservices.cancer.gov>).

It should be noted that in 2010, 895 billion dollars had been spent for the costs of caring for patients with cancer in the USA (Mariotto et al., 2011). In addition, the cost of the therapeutic team needed to provide intensive care for the elderly with cancer including geriatrists, geriatric oncologists, and geriatrics nurses impose heavy burden on the healthcare system (Muss, 2009).

In considering the above mentioned issues, the elder population in this present study based on the statistics provided by IRI Broadcasting Organization has widely increased. Also, 17.5% of the populations covered by insurance are the elderly who are at risk for developing various types of cancers. The purpose of this study was to evaluate the frequency of common cancers in elderly who are covered by this insurance company. These patients are well covered with an insurance benefits in the field of screening, early diagnosis, therapeutic interventions and healthcare in comparison to the benefits provided by other insurance companies.

Since cancer is the most important factor for disability and death in the elderly, so the results of this study can help policy makers, health care providers and the IRIB Organization not only for planning screening interventions of common cancers but also in decreasing the significant costs of treatment and care of older people and also help improve the quality of life of the elderly.

Materials and Methods

The present study is a descriptive cross-sectional research. Sample populations in this study were patients

diagnosed with cancer and covered by the insurance of IRI Broadcasting organization. A total of 735 patients participated in this study as the sample, of which 325 were males and 410 were females. In addition, patients' demographics have been documented in the register unit of the cancer clinic of the IRIB Organization in Tehran. Initially, permission from the head of the IRIB clinic was requested and upon approval, demographic data such as age, gender, type of cancer and year of diagnosis were extracted from the patients' files and were entered in the researcher-made questionnaire. Diagnoses of cancer in these patients were confirmed by the pathological test results. This study was approved by the ethics committee of University of Social Welfare and Rehabilitation. It should be noted that all patients data used in this study remained strictly confidential.

The software Excel and Spss were used to record and extract the needed data and the Chi-square test was used for data analysis ($p < 0.05$).

Results

Results of this present a study indicated that among the total population in this study, 75,500 personnel of the IRI Broadcasting covered by insurance, 39,112 were females and 36,388 were males, 17.2% (130,000 subjects) were above 60 years of age (mean \pm SD) and 82.87% (62,500 subjects) were below 60 years of age and were divided into three groups; 40-60 years old, 25-40 years old and under 25 years old respectively.

Also, 3% of the elderly developed cancer. The proportion of the elderly men and elderly women with cancer was 53.3% (210 subjects) and 46.7% (184 subjects), respectively.

The most prevalent cancers in middle aged women (40-60) were cancers of breast (80.8%), thyroid (5.1%), blood and circulatory system and colon (3.6%), brain tumor (2.9%), and bladder (2.02%) respectively; however, the most common cancers in middle aged (40-60) males were cancers of blood system (31.4%), prostate (23.9%), colon (19.5%), thyroid (13.4%), and brain tumor (6.5%) respectively (Figure 1).

The most prevalent cancers in old men were cancers of the prostate (61.3%), colon (10.3%), blood and bladder (9.6%), lung (9.1%), thyroid (3.9%) and brain tumors (1.3%) while in the elderly women, the most prevalent cancers are of the breast (80.1%), colon (5.1%), thyroid (4.4%), bladder and blood system (3.6%), lung (2.9%) and brain tumors (0.7%) respectively (Figure 2).

Generally, the statistical results demonstrated that the prevalence of cancer is higher in the elderly men in comparison to the elderly women. In addition, there was a significant relationship between gender and incidence of cancer in elderly ($P = 0.04$). Also, there was significantly relationship between age and prevalence of cancer in our samples ($P < 0.01$). However, this study indicated higher incidence of cancer in the elderly aged 60 and above in comparison to individuals who are less than 60 years of age. Therefore, we can conclude that age can be considered as an effective variable in the occurrence of cancer.

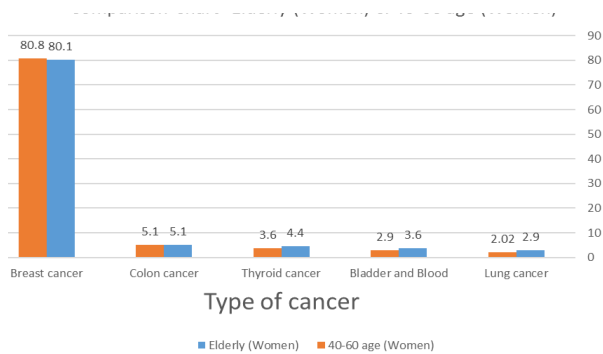


Figure 1. Prevalence of Cancer Based on Gender and the Younger Age Group in Women

Discussion

The aim of this study was to evaluate the prevalence and types of cancers in the elderly covered by insurance of the Islamic Republic of Iran Broadcasting Company in 2015 through a census. Results of the present study indicated that cancer of breast is the most common cancer among women above and below 60 years of age. These results are consistent with the reports and the findings of the studies conducted in other countries.

Based on the national report released by the Ministry of Health, Treatment and Medical Education, cancer of the breast with A.S.R, 28.25 rank first among cancer recorded cases on women in 2009 (ational cancer Registry Report, 2009) Also, the study conducted by Kolahdozan et al. indicated that cancer of the breast in the most prevalent type of cancer among Iranian women (Radmard, 2010). In another study conducted by Jazayeri et.al (2015), indicated that cancer of the breast is one of the most prevalent cancers among the elderly women in Iran (Jazayeri et al., 2015) also, the geographical diversity of breast cancer is approximately similar to the various parts of the world. In 2011, Jemal et al. indicated in their study that 21% of new aggressive cancers diagnosed in USA occurred in women aging 75 years old and above (Jemal et al., 2011) In the study conducted by Felay et al (2013) results showed that cancer of breast is the most common cancer in 40 European countries and is one of the four leading causes of cancer related death in Europe in 2012. Globolon 2012, cancer of breast (with 11.9%) is the most common diagnosed cancer in women (<http://globocon.iarc.fr.2012>) Also, cancer of the breast is one of the most prevalent types of cancer in the neighboring countries such as Iraq as indicated by the study conducted by Al-Hashimi et.al (2013), in Turkey as shown in the study conducted by Yılmaz et al (2010) and in Saudi Arabia as indicated in the study conducted by Ammar-Al-Rikabi et al (2012) .

With regards to the sample size in this present study, the number of patients with cancers covered by the IRI Broadcasting organization's insurance is 375. Results of the evaluation showed significant differences between the percentage of patients with breast cancers in comparison to the percentage of other cancers, so we recommend a comprehensive and complete evaluation for more clarification in this matter and recognizing the causes of these differences, cited as an example is breast cancer which has affected is 80.1% in women above 60 years

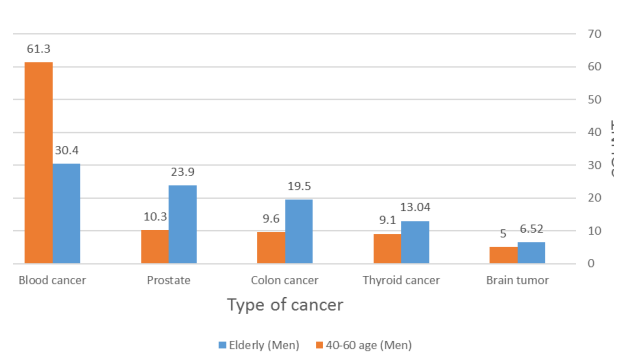


Figure 2. Prevalence of Cancer Based on Gender and the Younger Age Group in Men

of age while colon cancer which is the second common cancer has been estimated to affect only 4.6% in this group. Another significant difference can be also observed in the ratio of breast cancer in younger women which is 70.5% in comparison to thyroid cancer which is the second most common cancer affecting only 10.5% of patients.

In this present study, the differences in the percentage of the studied cancers can be lowered through the following interventions: multiple training to female employees of the organization in the form of various educational classes, distribution of books and articles related to early recognition of the signs and symptoms of breast cancer, the periodic examination by practitioner and to perform the diagnostic tests such as mammography and MRM however, its documentation needs comprehensive study with more volume of samples.

It should be noted that according to the WHO guideline, early recognition of patients and initiating optimum treatment in the early stages of cancer can decrease the burden of the disease (www.who.int/cancers/screening-and-treatment.2014).

Also, the disease can be identified in its primary stages and its severity can be lessened not only by optimum treatment but also with appropriate identification of environmental risks factors (such as obesity, use of hormones, increased age of marriage, lack of physical activity, misuse of alcohol and tobacco, infertility, or delivery after 30 years of age (Onsory et al., 2011) and by conducting educational classes to these women.

In the study conducted by Carol Sweeny in elderly women, it was indicated that the most important correctable factor in preventing breast cancer in the elderly is obesity (Adjusted Hazard Ratio= 1.4, CI=1.1-1.8) (Sweeny et al., 2004).

Results of this present study also demonstrated that cancer of prostate is the most common cancer in elderly men covered by insurance of the IRIB Organization. Because age is the greatest risk factor for prostate cancer, so the prevalence of this cancer is increased by higher life expectancy (Syrgos et al., 2005). According to Globocon 2012, the peak of age for developing prostate cancer is between the ages of 75 to 80 years (<http://globocon.iarc.fr.2012>). Although Sumi et al., has reported that cancer of prostate as the most common cancer in Iranian men above 65 years old and its incidence in Iran is similar to Eastern Asian and Middle East countries, but its rate is significantly less than the developed countries (Somi et

al., 2012). According to Akbari et al., cancer of prostate is the most common cancer in elderly men in Iran (Akbari et al., 2011).

The National report by the Ministry of Health, Treatment and Medical Education in 2009 demonstrated that cancer of the prostate with A.S.R 12.59 is the third leading cancer affecting Iranian men (National cancer Registry Report, 2009). The study conducted by Felay et al., indicated that cancer of prostate is the most common cancer in men in the UK, with 36% of patients aging 75 years and above, however prostate cancer has also affected 1% of patients who were less than 50 years of age (Ferlay et al., 2013). In USA, it has been reported that prostate cancer is the second diagnosed cancer in men and also it is the second leading cause of cancer related deaths (Somi et al., 2012). Hajjar et al. considered prostate cancer as the most prevalent cancer affecting the elderly men in countries such as Iraq, Turkey, Oman, and Lebanon (Hajjar et al., 2013) The risk of increasing age and early detection based on D.R.E, P.S.A test and biopsy has caused an increase number of patients diagnosed with prostate cancer. Results of two randomized clinical trials in USA (PLCO) and Europe (ERSPC) indicated that screening in the primary stages can meaningfully decrease the mortality rate of this cancer (Scosyrev et al., 2012).

In this study, most individual covered by this insurance were elders and screening test was performed for clients aging 50 years and above and this intervention can be considered as one of the reasons for increased statistics of patients with cancer, and also it showed the difference in the percentage of prostate cancer with other types of cancer. The question whether early detection can reduce mortality related to cancer among patients insured in this company or not needs further investigation.

As a whole, there is no significant difference between the rate of incidence and various common cancers in older personnel of IRIB Organization and the Iranian elderly population and the elderly people throughout the world (except non-melanoma skin cancer which is more common in Iran and in world). Although the prevalence of cancer in Iran especially among aged people is considered as a significant dilemma in the field of healthcare, but most of the common cancers are identifiable and preventable at their early stage. Therefore, the risk for disability of older people can be prevented by educating the community regarding periodic and regular tests, lifestyle changes, performing regular physical exercises, changing food habits and periodic regular examinations. Also, the costs of treatment can be decreased significantly. It should be stated that this study had some limitations; the secondary data that was used for the study and the profession of the subjects was not stated in the socio-demographic features, and because we have various job groups in the IRIB Organization such as technical groups, production and programming, the job might play an important role in causing cancer. We recommend therefore, that this issue will be evaluated further in the next studies.

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References

- Akbari ME, Rafiee M, Khoei MA, Eshtrati B, Hatami H (2011). Incidence and survival of cancers in the elderly population in Iran: 2001-2005. *Asian Pac J Cancer Prev*, **12**, 3035-9.
- Al-Hashimi M, Wang XJ (2013). Breast cancer in Iraq, incidence trends from 2000-2009. *Asian Pac J Cancer Prev*, **15**, 281-6.
- Al-Rikabi A, Husain S (2012). Increasing prevalence of breast cancer among Saudi patients attending a tertiary referral hospital: a retrospective epidemiologic study. *Croatian medical journal. Croat Med J*, **53**, 239.
- Berger NA, Savvides P, Koroukian SM, et al (2006). Cancer in the elderly. *Trans Am Clin Climatol Assoc*, **117**, 147-55.
- Cancer IAfRo. World cancer report (2014). Geneva: WHO.
- Dalooi MN, Bahrami T, Tabrizi M (2014). Epithelial to mesenchymal transition concept in Cancer: Review article. *Bimonth J Hormozgan Univ*, **18**, 183-94.
- Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J, et al (2013). Cancer incidence and mortality patterns in Europe: estimates for 40 countries in 2012. *Eur J Cancer*, **49**, 1374-403.
- Hajjar R, Atli T, Al-Mandhari Z, et al (2013). Prevalence of aging population in the Middle East and its implications on cancer incidence and care. *Ann Oncol*, **24**, 11-24.
- Jazayeri S, Sadat S, Ramezani R, Kaviani A (2015). Incidence of Primary cancer in IRAN. *Cancer Epi*, **39**, 519-27.
- Jemal A, Bray F, Center MM, et al (2011). Global cancer statistics. *CA Cancer J Clin*. **61**, 69-90.
- Johnson CM, Wei C, Ensor JE, et al (2013). Meta-analyses of colorectal cancer risk factors. *Cancer Causes Control*, **24**, 1207-22.
- Lichtenstein P, Holm NV, Verkasalo PK, et al (2000). Environmental and heritable factors in the causation of cancer-analyses of cohorts of twins from Sweden, Denmark, and Finland. *Najm*, **343**, 78-85.
- Mariotto AB, Yabroff KR, Shao Y, Feuer EJ, Brown ML (2011). Projections of the cost of cancer care in the United States: 2010-2020. *J Natl Cancer Inst*, **20**, 2006-14.
- Mousavi SM, Gouya MM, Ramazani R, et al (2009). Cancer incidence and mortality in Iran. *Ann Oncol*, **20**, 556-63.
- Muss H (2009). Cancer in the elderly: a societal perspective from the United States. *J Clin Oncol*, **21**, 92-8.
- National cancer Registry Report, Deputy for Health Directory, CDC cancer office Tehran, IRAN 2009.
- Noori Dalooi M. Molecular genetics in third millennium: Valume. Tehran . Summer 2009.
- Noori Dalooi M. Principles of Emeris Medical Genetics, Trinpi P, Elards: Jamenegar & Salemi Publishing; 2009.
- Onsory K, Ranapoor S (2011). Breast cancer and the effect of environmental factors involved. *Mol Mar Biol Biotechnol*, **1**, 59-70.
- Radmard AR (2010). Five common cancers in Iran. *Arch Iran Med*, **13**, 143-6.
- Scosyrev E, Messing EM, Mohile S, Golijanin D, Wu G (2012). Prostate cancer in the elderly. *Cancer*, **118**, 3062-70.
- Somi M, Mousavi S, Rezaeifar P, Naghashi S (2012). Cancer incidence among the elderly population in the Northwest of Iran: A population based study. *Iran J Cancer Prev*. **2**, 117-26.
- Sweeney C, Blair CK, Anderson KE, Lazovich D, Folsom AR (2004). Risk factors for breast cancer in elderly women. *Am J Epidemiol*. **160**, 868-75.
- Syrgos KN, Karapanagiotou E, Harrington KJ (2005). Prostate cancer in the elderly. *Anticancer Res*, **25**, 4527-33.

- Thakkar JP, McCarthy BJ, Villano JL (2014). Age-specific cancer incidence rates increase through the oldest age groups. *Am J Med Sci*, **348**, 65-70.
- Wang YC, Wei LJ, Liu JT, Li SX, Wang QS (2012). Comparison of Cancer Incidence between China and the USA. *Cancer Biol Med*, **9**, 128-32.
- www.who.int/cancers/screening-and-treatment.2014 Yang L, Fujimoto J, Qiu D, Sakamoto N (2010). Trends in cancer mortality in the elderly in Japan, 1970–2007. *Ann Oncol*, **21**, 389-96.
- Yılmaz HH, Yazihan N, Tunca D, et al (2010). Cancer trends and incidence and mortality patterns in Turkey. *Jpn J Clin Oncol*. **51**, 7-12