

Effect of Sex of Patients on the Injuries and Deaths of Certain Types of Cancers and Nutritional Instructions to Protect from Cancer

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ABSTRACT

This study is to evaluate the incidence and mortality of 1523 patients diagnosed with cancer for almost one decade in Misurata, Libya, to review what is known about some cancers specific for one sex, to illustrate safe diet and cancer risks, and to advise people about choices they can make to decrease their chances of developing cancer. The approximate percentage of men and women diagnosed with cancers were 52.6% and 47.4%, respectively. There was no statistically significant association between males and females for getting cancer disease ($P= 0.242$). Among 1523 cancer cases collected from 2004 to 2013, there were 1031 patients diagnosed with lung, prostate, breast and ovarian cancers, accounting for 67.7%. The approximate percentage of breast, lung, and prostate and ovarian cancers cases was 29%, 18%, 12% and 9%, respectively. There is no evidence of a statistically significant relationship between the incidence of lung cancer in males and breast cancer in females ($p = 0.218$); and the incidence of prostate cancer in males and ovarian cancer in females ($p = 0.254$). Among 1031 cases diagnosed with lung, prostate, breast and ovarian cancers in Misurata from 2004 to 2012 except the years 2006 and 2007, about 134 people (97 males and 37 females) died accounting for almost 13%. Men are more likely to die from cancer than women. Safe nutrition and healthy food plan with physical activity and walking for few hours per week may help to promote health of patients with cancer.

Keywords: Cancer Incidence, Mortality, Safe Nutrition

Abbreviations: ASCO - American Society of Clinical Oncology; NCIN – National Cancer Intelligence Network; US. CDC - United States Center for Disease Control and Prevention; WHO - World Health Organization.

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1. INTRODUCTION

Cancer incidence has been clearly increased and considered one of the most leading causes of mortality in the world (Delongchamps et al, 2006; Haas et al, 2008). The key difference between sex of patients (being men and women) is not clearly understood. Some cancers specifically occur in men and are affected by age, family history and smoking such as lung and prostate cancers (WHO, 2004; Delongchamps et al, 2006). On other hand, breast and ovarian cancers mostly occur in women and affected by age, family history and lifestyle (Ermiah, 2013; National Cancer Institute, 2012; Cancer Research UK, 2015; Permuth and Sellers, 2009). Most of all cancer incidences are related to environmental and life-style factors. Also, 35% of all cancers are related to unbalanced diets; while 30% of all cancers are related to smoking (Katzin 2012). Lung cancer is the most popular cancer in men, especially aged men (Cancer Research UK, 2015) and may kill more men than any other cancers (NCIN, 2010; WHO, 2004). Tobacco is the main factor causing of lung cancer and approximately 80 -90% of lung cancer cases can be related to it (NCIN, 2010). Prostate cancer represents the third most popular malignancy in men and the second leading cause of cancer-related mortality in males. It rarely occurs before age 50, but after this age, the disease incidence is mostly increased. In industrial countries, these tumor incidence rates are rising, while death rates are decreasing. This is due to the availability of medical care and cancer screening policies. However, in developing countries, no information is available for disease incidence and management because of the economic and social factors (Delongchamps et al, 2006).

At the present time, experts found that about one out of every eight women will be diagnosed with breast cancer at some time during her life (National Cancer Institute, 2012). Breast cancer considers one of the most popular malignancies in Libyan women (Ermiah et al, 2012) and may be affected by many factors such as lifestyle, utilization of screening mammography, and availability of appropriate care. These factors are very important because they allow diagnosis and treatment the cancer disease at the early stage (Ermiah, 2013). The other factors include big breast, menstruation before age 12, menopause after age 55, occurring a first full-term pregnancy after age 30, never having been pregnant, obesity after menopause, having radiation therapy before age 30, and alcohol use. But, the strongest risk factor for developing breast cancer is age as women get older (National Cancer Institute, 2012). Approximately, 15% of females diagnosed with breast cancer have a family history, whereas 5 – 10% may be related to genetic mutations. However, 85 % of women diagnosed with breast cancer have no family history, but the most significant causes for breast cancer are sex (being women) and age (growing older). In addition, ovarian cancer represents the 6th most popular cancer among females in the world (Permuth and Sellers, 2009), accounting for 4% of all new cases of cancer in women (Cancer Research UK, 2015). The causes of ovarian cancer are unknown, but they may be related to infertility, obesity and lifestyle factors including cigarette smoking and alcohol consumption (Permuth and Sellers, 2009). Komen (2014) documented that 70 % of women with genetic mutation develop breast or ovarian cancers by age 70.

Although eating well minimizes the risk of all types of cancers (Katzin, 2012), there are no foods exactly able to prevent from getting cancer. Some foods help promoting body health, maintaining the immune system and keeping the risk of cancer as low as possible (Dyer, 2014). These foods contain protective nutrients help to cure cancer including antioxidants, anticancers, dietary fibers and omega-3 fatty acids (Katzin, 2012). Also, fruits and vegetables have abundance of vitamins, minerals and antioxidants, which provide a healthy weight and may lower the risk of cancer (Palafox-Carlos et al, 2011), especially in beginning of the disease. In Canada, patients diagnosed with cancer at earlier stages had a better opportunity to survive from the disease (Ugnat et al, 2004). But, the quality of health and nutritional care for patients diagnosed with cancer in the Middle East and North Africa were lower than in developed countries (Ermiah et al, 2012). The objectives of this paper are firstly; to statistically evaluate the incidence and mortality among males and females in Misurata, Libya; secondly, to review what is currently known about sex of patients diagnosed with cancer and its influence on lung, prostate, breast and ovarian cancers; thirdly, to provide important information toward the understanding of healthy nutrition as a protection way from cancer.

2. METHODOLOGY

Data Collection

Data were obtained from Misurata National Cancer Institute Registry in Misurata, Libya and were provided by the Office of National Statistics on a request. A total of 1523 cases aged 10 to 95 years (801 males and 722 females) were diagnosed with cancer. The study was firstly included all cancers in Misurata from 2004 to 2013 and then focused on cancer-specific sites: lung, prostate, breast and ovaries. About 23 different types of cancer were observed, but this study focused on four types of cancers. All the patients with cancer included in this study were from Misurata, which is a second capital city in west Libya. The literatures on lung, prostate, breast and ovarian cancers were reviewed and summarized in this article.

Statistical Analysis

Descriptive statistics was calculated and data were analyzed using IBM SPSS Statistics Software (version 20.0, SPSS, Inc., Chicago, Illinois, USA). The Pearson Chi-square test was used to assess the significance of the association between men and women being diagnosed with lung, prostate, breast and ovarian cancers. In all tests, $\alpha < 0.05$ was regarded statistically significant. All confidence intervals (CIs) were calculated at the 95% level of statistical significance. Statistical analyses and graphs were produced by 2010 Microsoft Excel program.

3. RESULTS

Cancer incidence cases were observed in Misurata, Libya from 2004 to 2013 (Figure 1). The characteristics of the study population $n = 1523$ (801 males and 722 females) were statistically calculated. The mean, median and standard deviation (SD) values of cancer cases in males were 80, 90 and 47, respectively. Whereas, the mean, median and standard deviation values of cancer cases in females were 72, 87.5 and 38, respectively. The approximate percentage of men and women diagnosed with cancers were 52.6% and 47.4%, respectively. This indicates that men are almost 5.2% more likely than women to develop cancer. Our finding indicated that there was no statistically significant association between males and females for getting cancer disease ($P = 0.242$). This implied that cancer can affect both gender, but some cancers are specific for one sex. The total percentage of patients with cancer in Misurata from 2004 to 2013 is shown in Figure 2.

Among 1523 cancer cases collected from 2004 to 2013, there were 1031 patients being diagnosed with lung, prostate, breast and ovarian cancers, accounting for 67.7%. This study observed that there were 437, 271, 189 and 134 cases being diagnosed with breast, lung, prostate and ovarian cancers, respectively (Figure 3). The approximate percentage of breast, lung, and prostate and ovarian cancers cases was 29%, 18%, 12% and 9%, respectively. For breast cancer, the incidence in women was 422 cases accounting for 27.7 % versus 15 cases in men accounting for almost 1 %. In comparison, lung cancer incidence in males was estimated at about 244 cases accounting for 16 % versus 27 cases in females accounting for almost 2 %. Figure 3 shows 189 males and 134 females out of 1523 cases got prostate and ovarian cancers, respectively during 2004 to 2013. There is no evidence of a statistically significant relationship between the incidence of lung cancer in males and breast cancer in females ($p = 0.218$); and the incidence of prostate cancer in males and ovarian cancer in females ($p = 0.254$). This tells us that cancer affects various parts of the body, but cancer influenced by different reasons may lead to it.

Among 1031 cases diagnosed with lung, prostate, breast and ovarian cancers in Misurata from 2004 to 2012 except the years 2006 and 2007, about 134 people died accounting for almost 13% (Figure 4). About 97 males and 37 females died from cancer. This explains that men are more likely to die from cancer than women. Data showed that there were 75 (64 males and 11 females), 15 (1 male and 14 females), 32 and 12 cases died from lung, breast, prostate and ovarian cancers, respectively. The approximate percentage of people died from lung, breast, prostate and ovarian cancers were 7.3%, 1.5%, 3% and 1.2%, respectively. In this study, among 437 cases being diagnosed with breast cancer, there were only 15 people died.

4. DISCUSSION

One of the important finding in this work showed that the percentage of cancer cases have been increased overall during almost one decade in Misurata, especially in the years 2008 and 2012. Boder et al (2011), implied that breast cancer is obviously rising in west Libya; however, the incidence in Libya is significantly lower than that in Europe or the US. The significant increase in cancer incidence rates suggests that there has been no progress made in cancer control in Western Libya. Cancer control should decrease the expected number of new diagnoses, minimize the severity of disease and improve the quality of life for those diagnosed with cancer (Canadian Breast cancer foundation, 2013).

Lung, Prostate, Breast and Ovarian Cancers

A. Incidence

In some cancers, the incidence occurs largely in men higher than in women, or the opposite. This is because the difference in smoking, drinking behaviors, occupational exposures and differences in the metabolism of estrogen and androgen. Sometimes, the hormonal factor including late menopause and estrogen replacement therapy might make women more susceptible to develop cancer than men (McCann, 2000). Sex-specific incidences were observed substantially. For example, prostate cancer occurs only in males, ovarian cancer (females only), lung cancer (mostly in males) and breast cancer (mostly in females) (Cancer Research UK, 2015). It is clear that there are no cases of prostate cancer among females and there are little cases of breast cancer among males (McCann, 2000). In Libya, breast cancer mostly occurs in women, especially in young women (Ermiah et al, 2012). A previous study reported that breast cancer occurs in 18.9% of Libyan females (Boder et al, 2011). Also, in 2006, breast cancer accounted for 33.7% among females in Western Libya. In Arabic countries such as Egypt and Morocco, breast cancer accounts for 35% and 22.3% in females, respectively (Boder et al, 2011).

WHO (2004) reported that more men than women have lung cancer. Internationally; males are more smoker than females, accounting for four fifths of all smokers. This explains the role of sex and gender difference in the tobacco use (WHO, 2004). In Eastern Libya, cancer cases in men were mostly tobacco related. In 2007, 33% of Libyan men were smokers, while only 0.2% of women were tobacco smokers (El-Mistiri et al, 2013).

B. Morality

A previous work documented that cancer caused 8.7% of mortality in Benghazi, Libya (Singh and Al-Sudani, 2001). This study revealed a gap between men and women mortality because women do not mostly smoking. Also, men may be less likely to go to the doctor if they have early symptoms of lung cancer such as persistent cough. Lung cancer mortality is at higher rates in males than females (WHO, 2004). However, women seem to have a relatively higher risk than men if they smoke (McCann, 2000). 53% of deaths from worldwide lung cancer happen in less developed countries, accounting for 10 million deaths per year (WHO, 2004). For example, lung cancer causes 8.2% of deaths in Egypt (Singh and Al-Sudani, 2001). This explains that lung cancer deaths are higher among people with lower income (WHO, 2004). Another study documented that prostate cancer is responsible for 4.7% deaths in males (Singh and Al-Sudani, 2001). While, ovarian cancer is mostly worse in

older women (Poole and Nordin, 2012), but it can be treated in its early stages (Cancer Research UK, 2015; US. CDC, 2014; Poole and Nordin, 2012). In this work, data found that the percentage of ovarian cancer mortality is the lowest compared to lung, prostate and breast cancers.

In this study, the decline in the breast cancer mortality suggests that there has been important progress made in breast cancer control. However, a previous study reported that Libya is missing national cancer control plan (El-Mistiri et al, 2013) and lacking population-based information on cancer epidemiology. Another previous work indicated that breast cancer causes 12% of deaths in Libyan females and death rates are higher than any other cancers, besides lung cancer (Singh and Al-Sudani, 2001).] Also, the systematic breast screening is difficult in Libya because it would need a strong primary health care. Therefore, these data may lack sufficient details to capture breast cancer-specific mortality accurately. The quality of the data is affected by the quality of data capture systems within multidisciplinary teams and cancer registries (Poole and Nordin, 2012). Globally, breast cancer represents about 10–18% of all cancer-related mortality (Boder et al, 2011). Controlling breast cancer in Libya requires solving medical, social and economic issues. The death risks may also due to difficulties in treatment advances, earlier detection through screening, and increased awareness (Breast Cancer Organization, 2014). Today, in Canada, breast cancer mortality is reduced by 42 % because of earlier detection by mammography screening and improved medications (Canadian Breast cancer foundation, 2013).

5. CANCER AND NUTRITION

No diet program can treat cancer, but it may minimize treatment side effects or may help the body get well after the treatment and recovery (Dyer, 2014). Beside medications, safe nutrition may work well as alternative therapy and help cure cancer when used in combination with standard treatments (Cancer Research UK, 2015). Healthy diet program requires enhancing the intake of fruits, vegetables, fibers and grains and increasing the intake of water. Also, it requires not skipping breakfast because it is the most important meal of the day (Ghalaita et al, 2014). Some foods such as broccoli, garlic, onions, green tea, tomatoes, vitamin D, fish, poultry, eggs, nuts, seeds and grains including legumes, roots, tubers, oats, brown rice, corn, rye, beans and lentils, even coffee may be effective to lower cancer risk (Jaret, 2015; ASCO, 2015). Also, some food components including carotenoids, vitamin E, and some vegetables such as cabbage, cauliflower, and broccoli may protect against lung cancer. WHO, 2004 reported that diet rich in fruits and vegetables may decrease the risk of lung cancer. However, avoid smoking represents the best prevention. Additionally, poor nutrition is responsible for development of some cancer. For example, person who eats too small or too large amount of vitamin A mainly is at risk of lung cancer (Cancer Research UK, 2015; Jaret, 2015; ASCO, 2015).

Some research reported that there are no specific foods or supplements strongly decrease the risk of getting breast cancer. But, eating low-fat diet, eating more fruits, vegetables and whole grains, and losing weight may help minimize risk of recurrence and first-time breast cancer. Also, keeping a healthy weight and having a registered dietitian to evaluate the diet may decrease the risk of a first-time breast cancer coming back. This indicates that the risk of recurrence of breast cancer is increased in women who gained weight after their breast cancer diagnosis (Dyer, 2014).

There are also many foods reported as anticancer and anti-inflammatory agents such as garlic, green tea, spices (cumin and ginger), seaweeds and omega-3 fatty acids. Omega-3 fatty acids are long chain essential fatty acids and work as anti-inflammatory to support the immune system. They are important to protect from breast and ovarian cancers. They are found in nuts walnuts, macadamias, vegetable oils and dairy foods. Also, docosahexanoic acid (DHA) and eicosapentanoic acid (EPA) found in only fish like salmon, herrings or sardines and may minimize cancer (Katzin, 2012).

To reduce prostate cancer risk, susceptible person should eat diet containing lycopenes and selenium. These elements are able to lower the risk of prostate cancer. Lycopenes is found in tomatoes and selenium is found in vegetables, fish and wheat germ. Also, watermelon, strawberries and vitamin E may protect against prostate cancer, especially men above 50 years old (Ross, 2010).

On other hand, some foods may promote the risk of breast and prostate cancers such as low-fiber diet or high-energy foods. These foods include artificial sweeteners, cured, pickled, salty meats, burnt or barbecued foods and alcoholic beverages. Also, peanuts when contaminated with toxic producing molds may cause lung cancer (Cancer Research UK, 2015; Ross, 2010). Rich-fat diet may cause obesity, which considers as a risk factor for breast and ovarian cancers (Cancer Research UK, 2015). Also, refined starch and refined sugar may enhance the risk of cancer (Ross, 2010). Therefore, safe nutrition and healthy food plan with exercise activity may protect from cancer (Dyer, 2014).

6. NUTRITIONAL INSTRUCTIONS TO PROTECT FROM CANCER

Eating a wide variety of foods from each of the five food groups, in the amounts recommended helps maintain a healthy body and provides a range of different nutrients to the body. The five food groups consist of fruits, vegetables, grains, milk products and lean meats and poultry (Campbell and Media, 2015). Some advices are helpful for keeping cancer risk as low as possible (Dyer, 2014). The country should open more smoking clinics to assist smokers to have quit smoking. Also public health clubs should be available with special discounts to encourage people to exercise or open public parks with exercise equipments (Ghalaita et al, 2014). Here are some important tips help body stays healthy (ASCO, 2015; Campbell and Media, 2015; Dyer, 2014; Jaret, 2015):

- Have a registered dietitian to evaluate the diet and medical record.
- Drink a valuable amount of water during per day.
- Maintain body weight in a healthy range for height using body mass index measurement (BMI).
- Eat more than 5 cups a day varieties of vegetables (especially, raw vegetables, leafy green vegetables, carrots and fruits (citrus fruits, in particular) and whole grains.

- Eat more than 1½ a cup of tomatoes per day.
- Eat cruciferous vegetables such as broccoli and cabbage.
- Gradually minimize the amount of fat. The fat intake should be less than 20% of total calories per day (an average amount is approximately 30 to 35% of total calories per day).
- Avoid consumption of foods with the highest fat content such as fried foods and margarine.
- Eat foods rich in omega-3-fatty acids.
- Avoid eating some foods like food containing trans fats.
- Limit eating salty foods and foods processed with salt.
- Eat appropriate amount of fish and poultry.
- Avoid consumption of processed meats including curing, salting or smoking meats, and some sausages and burgers.
- Avoid consumption of supplements to protect against cancer.
- Avoid smoking.
- Avoid alcohol consumption.
- Sleeping enough hours each night (7-8 hours) is recommended.
- Walking for few hours per week.

7. CONCLUSION

Cancer affects various parts of the body, but different risk factors may lead to it. Cancer can also affect both men and women, but some cancers are specific for one sex. In some cancers, the incidence occurs largely in men higher than in women, or the opposite. This is because the difference in smoking, drinking behaviors, occupational exposures and differences in the metabolism of estrogen and androgen. In Misurata, men are almost 5.2% more likely than women to develop cancer. Also, men are more likely to die from cancer than women. For lung cancer, results reveal a gap between men and women mortality because women do not mostly smoking.

Health service aspect is important, but nutritional factor should not be excluded. A wide variety of nutritious foods may minimize cancer risks. Some food components including carotenoids, vitamin E, cabbage, cauliflower, and broccoli may protect against lung cancer. Eating low-fat diet, eating more fruits, vegetables and whole grains, and losing weight may help minimize risk of recurrence and first-time breast cancer. Omega-3 fatty acids are important to protect from breast and ovarian cancers. Lycopenes, selenium, watermelon, strawberries and vitamin E may protect against prostate cancer, especially men above 50 years old. On other hand, some foods may promote the risk of cancers such as low-fiber diet, rich-fat diet, refined starch and refined sugar. There is a need for developing cancer awareness to decrease cancer deaths by promoting early detection and study the difference between men and women with regard to the impact of protective factors such as diet and exercise.

SUMMARY OF RESEARCH

1. This paper evaluates cancer incidence and mortality among 1523 males and females in Misurata, Libya from 2004 to 2013. The study was firstly included all cancers in Misurata from 2004 to 2013 and then focused on cancer-specific sites: lung, prostate, breast and ovaries. Sex-specific cancers were observed. For example, prostate cancer occurs only in males, ovarian cancer (females only), lung cancer (mostly in males) and breast cancer (mostly in females). Our finding indicates that there is no statistically significant association between males and females for getting cancer disease ($P=0.242$). This implies that cancer can affect both men and women and is able to affect various parts of the body. But, there are different risks factors may lead to cancer and make it mostly happen in one sex. Results reveal that men are more likely to develop and die from cancer than women. This is because the difference in some habits such as smoking, drinking behaviors and occupational exposures.
2. The study also provides important information with recommended advices toward the understanding of healthy nutrition as a protection way from cancer. Some foods may cause obesity and promote the risk of cancers such as low-fiber diet, high-energy foods, rich-fat diet, artificial sweeteners, cured, pickled, salty meats, burnt or barbecued foods, alcoholic beverages, refined starch and refined sugar. However, safe nutrition and eating well with physical activity may minimize the risk of all types of cancers. Healthy foods contain protective nutrients help to cure cancer including antioxidants, anticancers, dietary fibers and omega-3 fatty acids such as fruits, vegetables, grains, milk products and lean meats and poultry.

COMPETING INTERESTS

We (authors) declare that we have no conflict of interest.

DISCLOSURE STATEMENT

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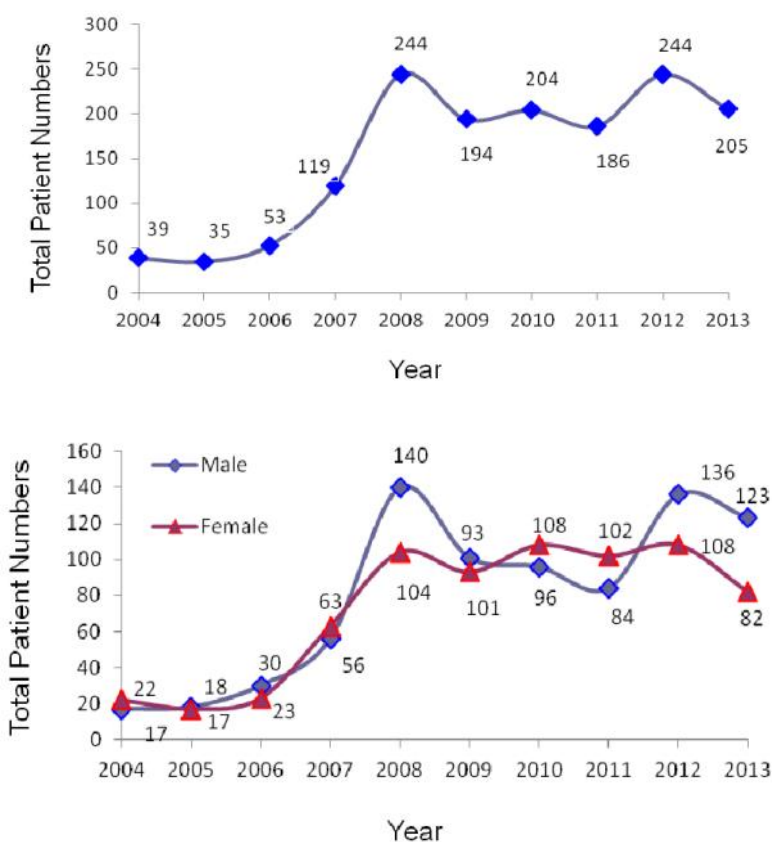


Figure 1

Distribution of patients diagnosed with cancer in Misurata from 2004 to 2013 (n = 1523)

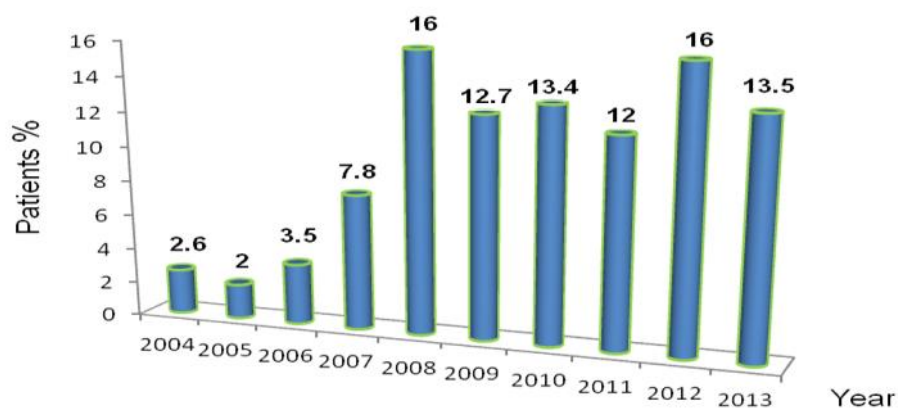


Figure 2

Percentage of patients diagnosed with cancer in Misurata from 2004 to 2013 (n =1523)

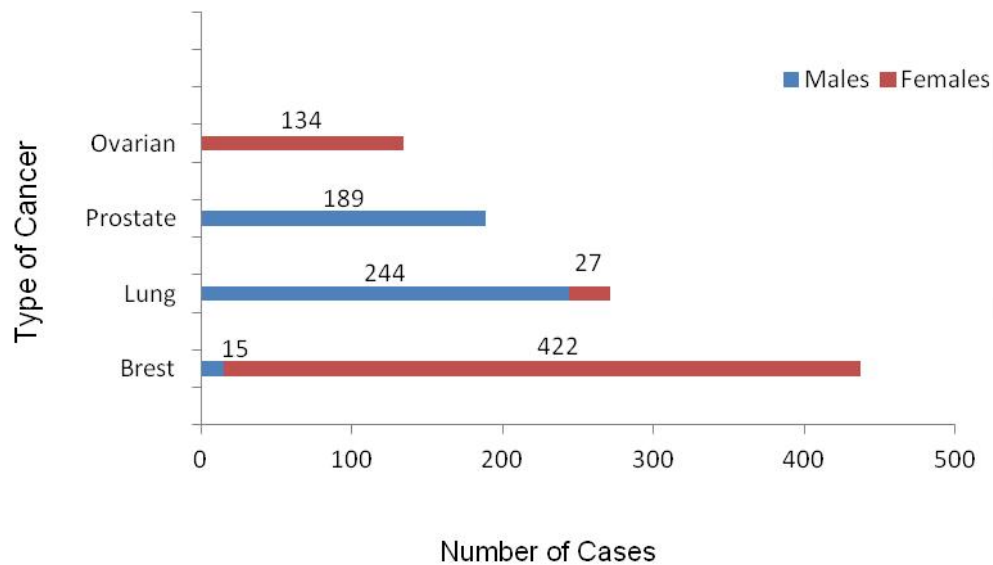


Figure 3

Breast, lung, prostate and ovarian cancer cases in Misurata from 2004 to 2013 (n=1031)

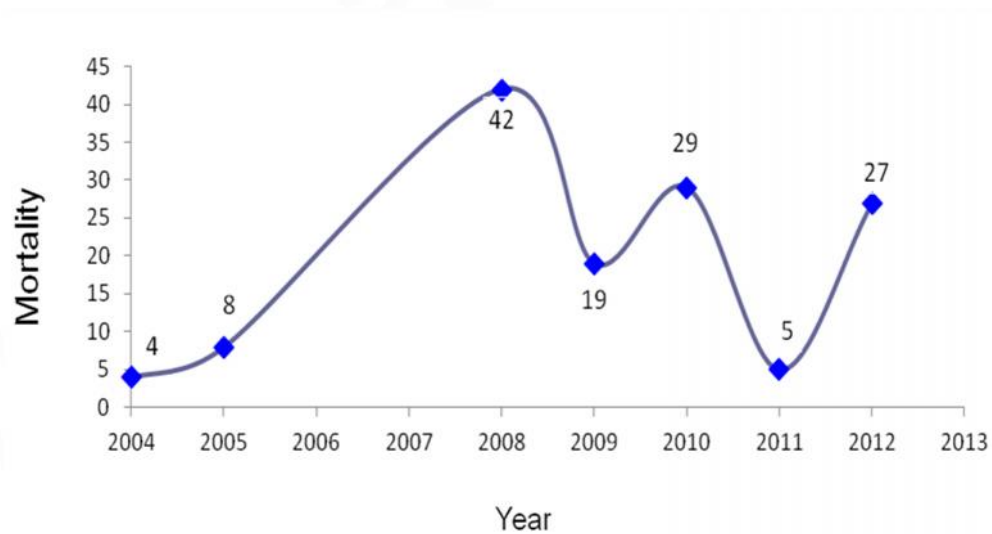


Figure 4

Mortality cases of patients with lung, prostate, breast and ovarian cancers from 2004 to 2012 except the years 2006 and 2007