



A REVIEW ON NATIONAL AND INTERNATIONAL EPIDEMIOLOGICAL SCENARIO OF CANCER

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Article Received on 21/05/2022

Article Revised on 11/06/2022

Article Accepted on 01/07/2022

ABSTRACT

In addition, the forecast for cancer patients in 2015 and 2020, respectively, has been made. These aggregated data show that the number of men, women and the number of cancer patients in 2004 was 390809, 428545 and 819354 respectively. Because of the involvement of multiple signature methods, a potential multidisciplinary diagnostic agent will likely be needed to reduce the risk of obesity-related cancer. Pyrolysates are produced by charcoal cooking or the heating of meat smoke, which has a carcinogenic effect on our body cells (Lauber et al, 2007). However, that inhibitors of these signature cascades can reduce the risk of obesity-related cancer remain unanswered. The percentage of cancer deaths gradually increased between 1990 and 2016. basal cell carcinoma, squamous cell carcinoma and melanoma exposure to ultraviolet light, which is ionizing radiation (Anand et al, 2000). Recently, Gupta et al. (Nafae et al, 1973). An increased risk of cancer has been observed in people who use chlorinated water for long-term drinking purposes. Similarly, 462408 male cancer patients and 517378 female cancer patients were recorded, with a total of 979786 patients in 2010. Cancer patients are complete, respectively. Smoking is the most common cause of lung cancer (Hammond et al, 1958). In contrast, Bhopal men have the highest rate of tongue cancer in the world (nine out of 100,000) (Bobba et al. Focus on reducing cancer incidence and improving the quality of life of cancer patients and their families.

KEYWORD: Cancer, radiotherapy, preventive measures.

INTRODUCTION

Globally, noncommunicable diseases (NCDs) account for 71% of all deaths. In India, NCDs account for 63% of all deaths, and cancer was one of the leading causes (9%). information about cancer emergence, trends, and speculation.^[3-7]

In India, systematic data collection on cancer has been done since 1982 by (PBCRs) and the hospital-based cancer register (HBCRs) under the National Cancer Registry Program (NCRP) - National Center for Disease Informatics and Research (NCDIR) of the Indian Medical Research Council (NCDIR). ICMR; ICMR-NCDIR-NCRP), Bengaluru (Appendix). The NCRP started with the goal of producing reliable data on the size and patterns of cancer. Several NCRP reports on cancer from various registrations across India have been published.^[8-9]

PBCRs provide statistics on the incidence and outcome of cancer in geographically defined individuals. They also provide a framework for testing to control cancer in

the community. HBCRs are concerned about recording information about patients with cancer diagnosed in a particular hospital and are mainly used to review clinical practice and the hospital cancer program.^[10]

Cancer scenario in India

Data from cancer patients were compiled from 2004 to 2010 in India and are shown in Figure 1.

Based on the growing performance of cancer patients in the last few decades, the number of cancer patients predicted by the end of 2015 and 2020 in India. These aggregated data show that the number of men, women and the number of cancer patients in 2004 was 390809, 428545 and 819354 respectively. The number of male and female cancer patients increased steadily until 2009, with 454842, 507990 and 962832 cases of male, female and total cancer patients, respectively. Similarly, 462408 male cancer patients and 517378 female cancer patients were enrolled, with a total of 979786 patients in 2010. Thus, it is clear from this Illustration that the number of cancer cases has gradually increased over time. In

addition, the forecast for cancer patients in 2015 and 2020, respectively, has been made. The different types of

cancer seen in India are discussed in the following sections briefly.

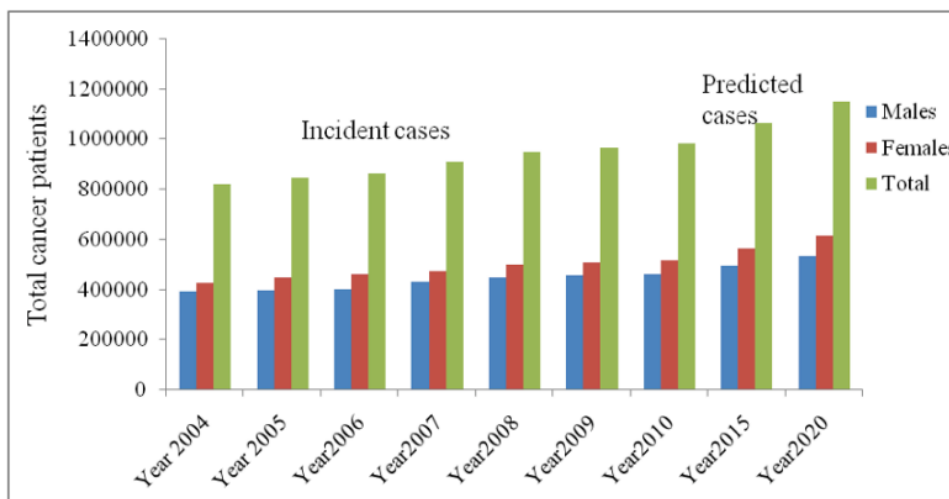


Fig: 1 Cancer scenario in India.

RISK FACTORS OF CANCER IN INDIA

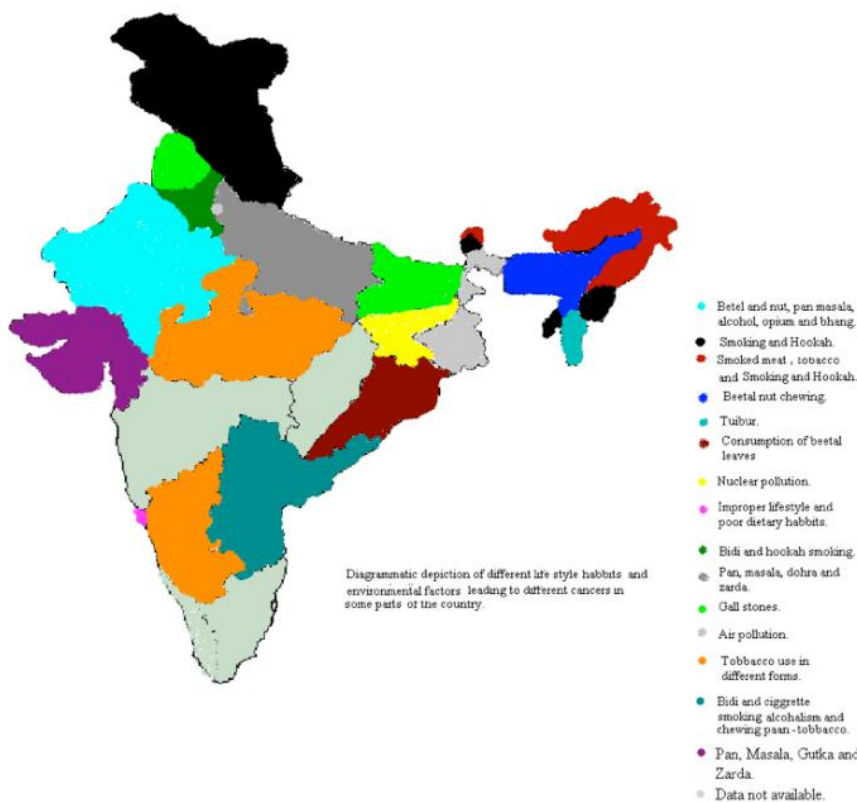


Fig. 2: Etiological factors for the prevalence of different cancers in India.

Dietary habits- Our research tells us that poor nutrition is one of the main causes of cancer spread in India. About 70% of cases of colorectal cancer are believed to be caused by an unbalanced diet. The role of the diet for cancer varies greatly according to the type of cancer (Anand et al, 2008; Willett, 2000). As with international relations studies, a positive relationship between dietary fats, red meat consumption and colorectal cancer and

death has been observed. Excessive consumption of red meat is a major cause of several cancers including gastrointestinal tract and colorectal (Bingham et al, 2002; Chao et al, 2005; Hogg, 2007), prostate (Rodriguez et al, 2006), bladder (Garcia-Closas et al., 2007), chest (Tappel, 2007), gastric (Hanlon, 2006) and oral cancer (Toporcov et al, 2004). Most likely, it is due to the production of heterocyclic amines (most potent

carcinogens) during cooking red meat. Pyrolysates are produced by charcoal cooking or the heating of meat smoke, which has a carcinogenic effect on our body cells (Lauber *et al.*, 2007). About 20% of the total variability of fried beef is due to the presence of PhIP (2-amino-1-methyl-6-phenyl-imidazo [4, 5-b] pyridine), which is the most abundant mutagen in cooking. beef. Food stored in plastic containers becomes carcinogenic because the bios-phenol from plastic containers dissolves and moves

into food; leading to breast cancer (Durando *et al.*, 2007) and prostate (Ho *et al.*, 2006) cancer. Low fresh fruit foods and high cooking temperatures in Indian dishes may result in low levels of vitamin C; leading to high risks for the stomach, mouth, pharyngeal, esophageal, 2003). Recently, a case-control study conducted on Asian Indian immigrants to the U.K. and in the U.S.A. found high levels of homocysteine as a risk factor for breast, ovarian and pancreatic cancers (Wu *et al.*, 2002).

	Decreased Risk	Increased Risk
Oral cancer	Diet high in vegetables and fruits, ³⁹ Fish ³⁹ Eggs ³⁹	Betel quid chewing ³⁸ Reverse smoking (palate) ⁴⁰
Esophageal cancer	Diet high in vegetables ⁴³	Betel quid chewing ⁴³ Chillies ⁴¹ Salted tea ⁴¹ Kalakhar ⁴²
Endometrial cancer	Diet high in vegetables and fruits ² Diet high in carotenoids ²	High body mass index ² Saturated fat intake ² Human papillomavirus (?) ⁴⁴
Cervical cancer	Vitamins C and E ²	Human papillomavirus ⁴⁴ Tobacco use ²
Ovarian cancer	Diet high in fish ²	Saturated fat intake(?) ² Human papillomavirus (?) ⁴⁴
Breast cancer	Diet high in vegetables and fruits ³⁸ High physical activity (possible) ²	Diet high in saturated fats ² High body mass index ³⁸ Saturated fat (?) ²
Stomach cancer	Green tea, ⁵² Turmeric ³⁰ Cumin, ³⁰ Basil, ³⁰ Tapioca ⁵³	Dried fish ⁵² High-temperature foods ⁵³ Chillies ⁵³ Spicy foods ⁵³ High consumption of rice ⁵³ <i>Helicobacter pylori</i> ³⁰

Table: 1 Possible dietary and other factors associated with Cancer in India.

1. Tobacco- Tobacco use is the leading cause of cancer in India. Figure 3 shows the regular use of tobacco for smoking, chewing, snuff etc. in some parts of the country, the cause of 65 to 85% of cancer cases is men and women, respectively. The various cancers produced by tobacco use are oral, pharynx, esophagus, throat, lungs and bladder. It has been noted that women in Bangalore are known to have the highest rates of esophagus cancer in the world (approximately eight out of 100,000). In contrast, Bhopal men have the highest rate of tongue cancer in the world (nine out of 100,000) (Bobba *et al.* 2003). Smoking is the most common cause of lung cancer (Hammond *et al.*, 1958). Approximately, 87% and 85% of men and women were diagnosed with lung cancer as a result of bid-based smoking (a small South Asian tobacco site filled with a group of cigarettes and wrapped in a piece of tendon, tied with string to another. Finally) (Behera *et al.*, 2004) and tobacco in India (Notani *et al.*, 1974). The complex nature of bidi has been proven by the studies of Jussawalla and Jain

(Jussawalla *et al.*, 1979) and (Pakhale *et al.*, 1985). They found that the unadulterated type of tobacco used in bidis (WHO, 1999) and the frequency at which bid required high blood pressure per minute may be responsible for its higher carcinogenic effects compared to cigarettes (Bano *et al.*, 2009). Bidi second-minute inhalation produces the same amount of cancer-causing compounds (steam volatile phenols, hydrogen cyanide and benzopyrene) as single-dose per minute in raw cigarettes (Pakhale *et al.*, 1990). Hookah (a special tobacco used in India for use in unripe tobacco) smoking causes lung cancer; as reported by Fafae *et al.* (Nafae *et al.*, 1973). Recently, Gupta *et al.* (Gupta *et al.*, 2001) reported that 80 and 33% had lung cancer in men and women who smoked, respectively, compared with controlled studies where these numbers were 60 and 20%. Otherwise.

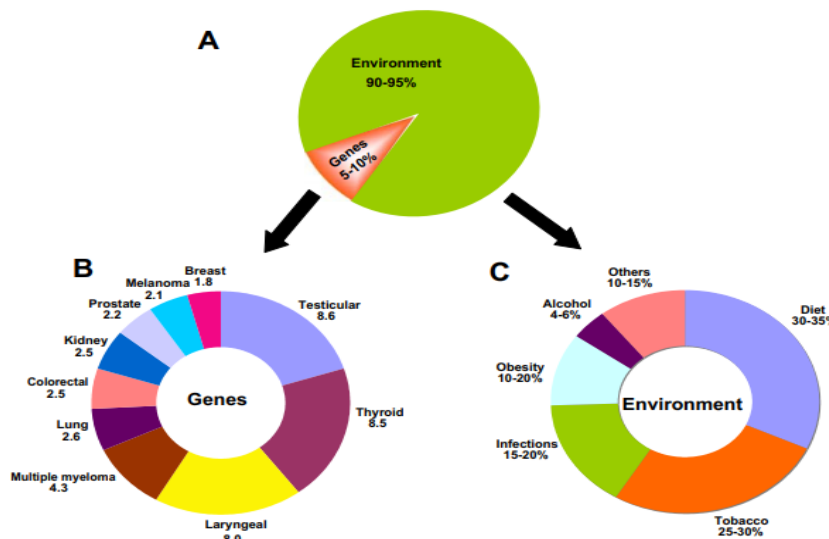


Fig: 3 - The percentage contributions of genetic and environmental factors to Cancer.

2. Alcohol- Alcohol use has been considered one of the major causes of colorectal cancer according to a recent WHO monograph (Baan et al, 2007).

Annually, approximately 9.4% of new cases of colorectal cancer are caused by alcohol consumption, worldwide (Parkin et al, 2002). An increased risk of 10% was observed with the consumption of more than two drinks a day, indicating the causal role of alcohol consumption in colorectal cancer (Toriola et al, 2008). Recently, a study revealed that an increased risk of colorectal cancer was limited to alcohol consumption of more than 30.0 g per day (Longnecker et al., 1990).

The relationship between alcohol consumption and the increased risk of esophageal cancer became known in 1910 (Tuyns, 1979). However, chronic alcohol

consumption has been found to be harmful to upper and lower respiratory tract cancer, including the oral cavity, hypopharynx, larynx and esophagus and liver, pancreas, mouth and breast cancer (Tuyns, 1979; Maier et al, 1994; Seitz et al, 2004; Doll et al, 1981). Drinking 10.0g / day alcohol for a woman increases the risk of breast cancer by 7.1% (Doll et al, 1981).

The mechanism of carcinogenesis due to alcohol consumption is not well known, however, it is thought that ethanol to co-carcinogen may play an important role in carcinogenesis (Poschl et al, 2004). The metabolic products of ethanol are acetaldehyde and free radicals. Free radicals are responsible for the relief of carcinogenesis by alcohol by binding to DNA and proteins, destroying foliates leading to an increase in secondary hyperactivity (Anand et al, 2000).

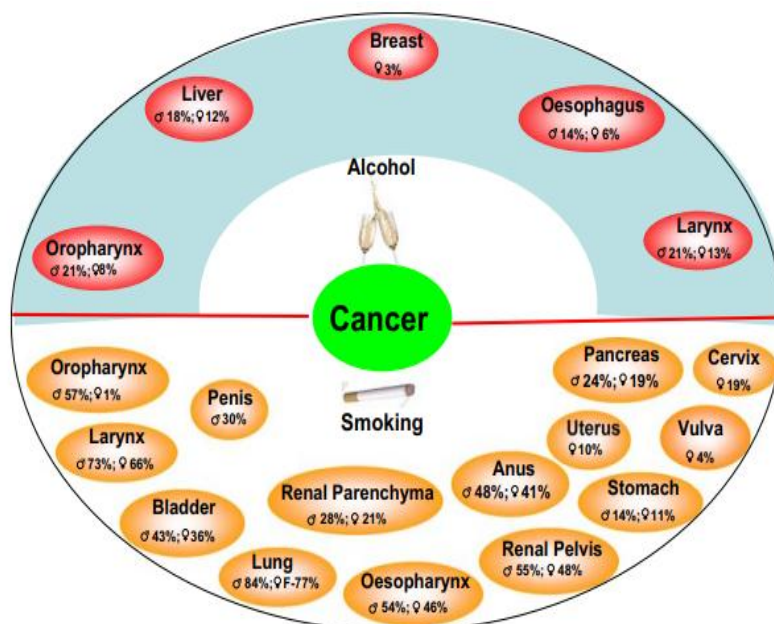


Fig. 4: Cancers that have been linked to alcohol and smoking. Percentages represent the cancer mortality attributable to alcohol and smoking in men and women as reported by Irigaray et al.

3. Radiation-In both developed and developing countries, radiation is also a factor. About 10% of cancer cases are due to radiation, both ionizing and non-ionizing (Belpomme *et al.* 2007). The main sources of radiation are compounds that emit radiation, ultraviolet (UV) radiation and electromagnetic pulsed fields. The main types of cancer caused by exposure to adequate carcinogenic radiation include thyroid gland, skin, leukemia, lymphoma, lung carcinomas and breast. The most common source of exposure to ionizing radiation is Radon, which is a radioactive substance. Nuclei-containing nuclei, radium and uranium radiation were found to be associated with an increased risk of stomach cancer in mice. The greatest risk of developing breast cancer in girls during adolescence is due to X-ray radiation (used for diagnostic and therapeutic purposes). A major risk factor for different types of skin cancer is basal cell carcinoma, squamous cell carcinoma and melanoma exposure to ultraviolet light, which is ionizing radiation (Anand *et al.*, 2000). An underground nuclear test could be a major cause of digestive system, liver and kidney cancer, as radiation has been reported in groundwater in a nuclear weapons testing facility. In addition, Figure 3 clearly shows that nuclear contamination is a major cause of lung cancer in Jharkhand.

4. Miscellaneous pollutants- It is estimated that approximately 90% of cancers are caused by environmental pollution (Anand *et al.*, 2000). Different types of cancer are believed to be caused by the negative effects of pollution. The risk of developing lung cancer is increased by the number of external pollutants such as poly aromatics hydrocarbons. Prolonged exposure to PAHs (polyaromatic hydrocarbons) in the air was found to increase the risk of lung cancer-related deaths. Indoor pollutants such as organic compounds and pesticides increase the risk of leukemia and lymphoma, brain tumors, Wilm tumors, Ewing's sarcoma and viral tumors. An increased risk of cancer has been observed in people who use chlorinated water for long-term drinking purposes. N-Nitroso compounds (mutagenic in nature) are composed of nitrates present in drinking water and increase the risk of lymphoma, leukemia, and colorectal cancer and bladder cancer (Belpomme *et al.*, 2007). Figure 3, also shows that high levels of air pollution are the cause of the spread of lung cancer in Delhi and other parts of West Bengal including Calcutta. Low socioeconomic conditions associated with poor hygiene, poor nutrition or bacterial infections are also responsible for a variety of cancers (Mehrotra *et al.*, 2003).

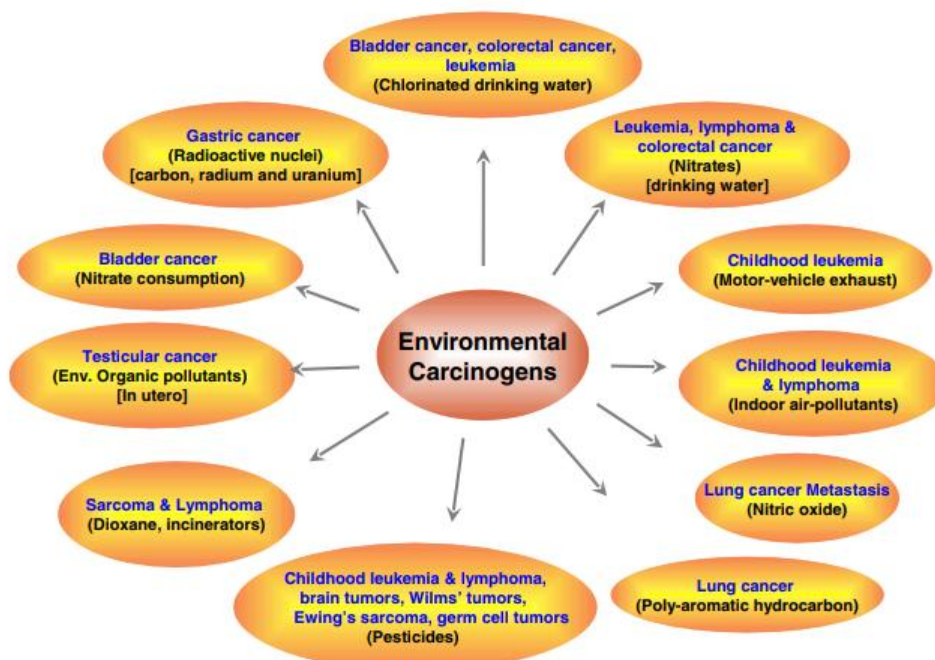


Fig. 5: various cancers that have been linked to environmental carcinogens. The carcinogens linked to each cancer is shown inside bracket.

5. Obesity- According to a study by the American Cancer Society, obesity is associated with an increase in deaths from colon, breast cancer (postmenopausal women), endometrium, kidney (renal cell), esophagus (adenocarcinoma), gastric cardia, pancreas, prostate, gallbladder, and liver (Fig. 8). The findings of this study indicate that of all cancer deaths in the United States, 14% in men and 20% in women are caused by obesity or

obesity. The rise in modernity and diet and the Western lifestyle have been linked to an increase in obesity in many developing lands. Studies have shown that the common causes of obesity and cancer include neurochemicals; hormones such as insulinlike growth factor 1 (IGF-1), insulin, leptin; sex steroids; obesity; insulin resistance; and inflammation.

The inclusion of signaling mechanisms such as the IGF / insulin / Akt signature method, the leptin / JAK / STAT method, and other inflammatory events are also linked to both obesity and cancer. For example, hyperglycemia has been shown to activate NF-κB, which can link obesity to cancer. Also known as NF-κB activates several adipocyte-produced cytokines, such as leptin, tumor necrosis factor (TNF), and interleukin-1 (IL-1). Energy

balance and carcinogenesis are closely linked. However, that inhibitors of these signature cascades can reduce the risk of obesity-related cancer remain unanswered. Because of the involvement of multiple signature methods, a potential multidisciplinary diagnostic agent will likely be needed to reduce the risk of obesity-related cancer.

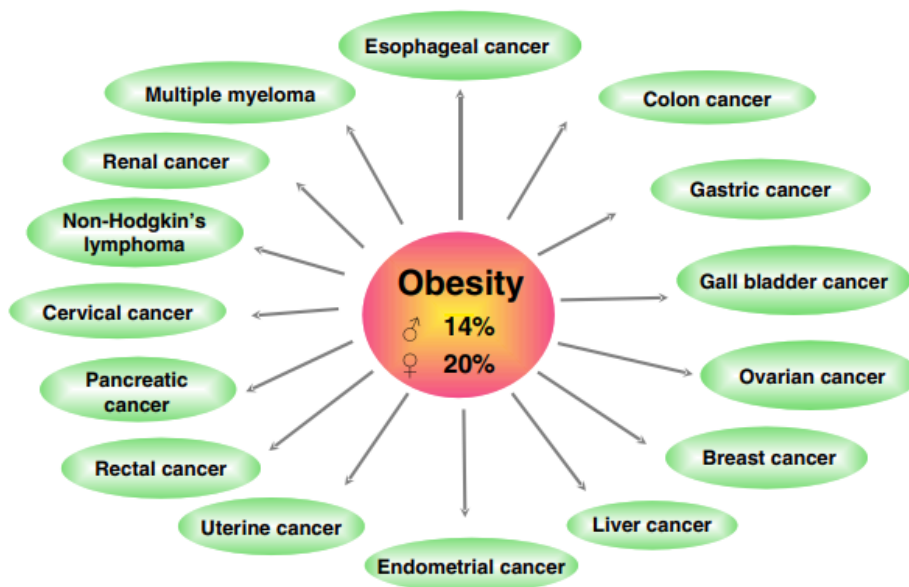
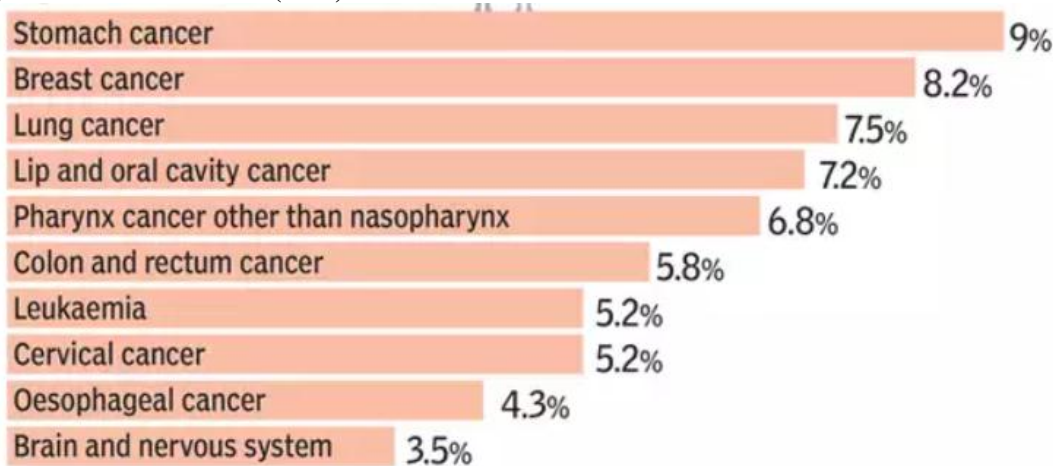


Fig: 6 various cancers that have been linked to obesity.

Percentage of total death in India (2016)



Cancer scenario in Saudi Arabia^[11]

In 2018, there 10518 cancer deaths with 24,485 new cancer cases in Saudi Arabia (total population = 33,554,333).

In 2018, there were 10518 cancer deaths with 24,485 new cancer cases in Saudi Arabia (population = 33,554,333)^[16] The most common types of cancer include breast cancer, colon-rectum (CRC), and

prostate.^[17] The most commonly reported risk factors associated with breast cancer were hormonal imbalances, diet, lifestyle, and obesity.^[18] Recent research has reported a growing trend for CRC in Saudi Arabia.^[19] In 2018, CRC accounts for 14.6% of all cancers in the country.^[16] CRC risk factors may be genetic, environmental, age, sex and other inflammatory conditions of the digestive tract.

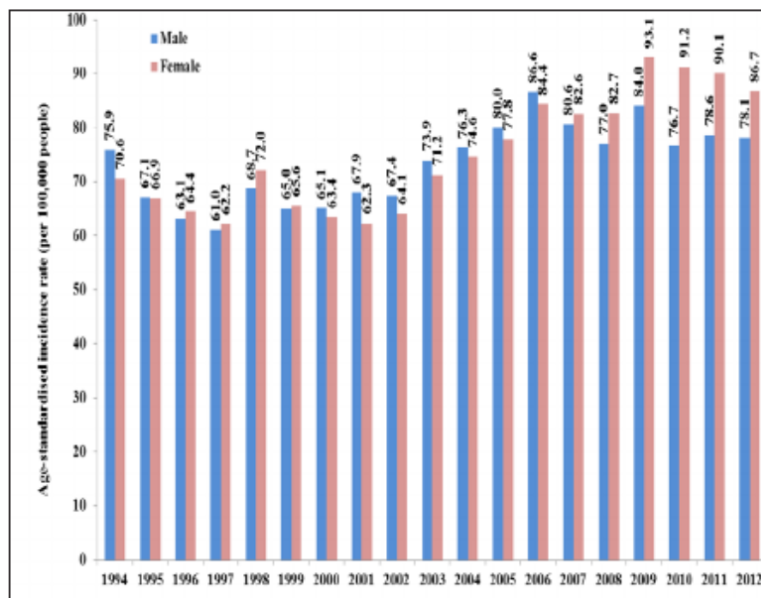


Fig. 7: Cancer.

Scenarios in Saudi Arabia

Percentage of total death in Saudi Arabia- The death toll from cancer has increased in recent years in Saudi Arabia. The percentage of cancer deaths gradually

increased between 1990 and 2016. In 1990, the total number of deaths from cancer was estimated at 5%, and the rate increased to 12% in 2016, as shown in Figure.

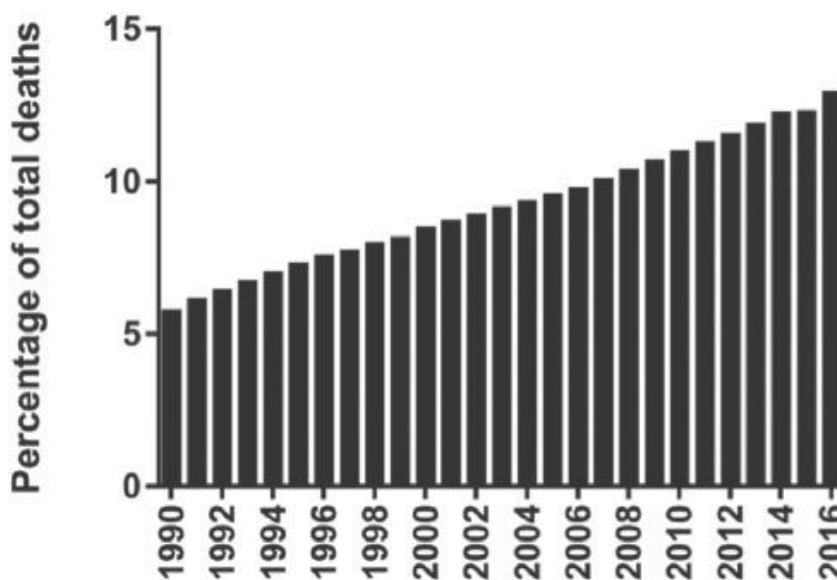


Fig. 8: Percentage of total death in Saudi Arabia.

The World Health Organization Cancer Control Strategy

According to the World Health Organization (WHO), cancer has become a major health issue in EMR. Jesus' WHO Cancer Control Objective aims to strengthen and accelerate the translation of cancer control information into public health practice. The focus is on reducing the incidence of cancer and improving the quality of life of cancer patients and their families.

However, the biggest obstacle to dealing with global cancer cases and mortality rates in EMR is the lack of accurate and well-defined data, including the lack of a

clear and well-documented public health policy for all non-communicable diseases, including cancer; and the lack of political support to improve law and order in order to build and improve the effectiveness of cancer registers.^[21]

Although most Arab countries have human-based cancer registration centers, not all cancers are well documented and cancer death data is limited; for example, there is no strong evidence for the true prevalence and prevalence of oral cancer in many Arab countries due to the lack of human-based studies.^[22] In addition, according to a recent report of cancer cases from the Gulf Center for

Cancer Control and Prevention,^[23] and other studies,^[24] most cancers among Gulf States nations were diagnosed late and affected very young people. There are a variety of functional factors, including local barriers that make it difficult to access care, lack of medical infrastructure and trained professionals to provide quality care, and a lack of awareness or insufficient understanding of cancer biology.

Plan of action in the Islamic and Arab World

Prevention and control measures should address the dynamic risk factors of primary and secondary prevention, early detection and protection of human health and well-being. This can be achieved through the adoption of national cancer screening programs available in Arab countries, or through a shared decision-making policy, in which patients are supported to consider options and achieve informed preferences, e.g. a shared decision-making process for prostate cancer. Finally, there is a need for a public health system, the development of regional and national cancer registration centers, and health education campaigns that address barriers to cancer screening.

Simple Things Can Reduce Risk of Cancer

- Not using tobacco;
- Maintaining a healthy body weight;
- Eat a healthy diet, including fruits and vegetables;
- Regular physical activity;
- Avoid or reduce alcohol consumption;
- HPV and hepatitis B vaccines if you are part of a group recommended for vaccination;
- Avoid exposure to ultraviolet radiation (mainly caused by sun exposure and artificial sun exposure) and / or by using sunscreen;
- Ensuring the safe and appropriate use of radiation in health care (for diagnostic and therapeutic purposes);
- Reducing exposure to work in ionizing radiation; and
- Reducing exposure to outdoor air pollution and indoor air pollution, including radon (a gas emitted by natural decomposition of uranium, which can accumulate in buildings - in homes, schools and workplaces).

Early detection

Cancer mortality decreases if cases are diagnosed and treated early. There are two parts to early detection: early diagnosis and testing.

Early diagnosis

If diagnosed early, cancer is more likely to respond to treatment and may result in greater chances of surviving a minor illness, as well as less expensive treatments. Significant progress can be made in the lives of cancer patients by detecting cancer early and avoiding delays in care.

Early diagnosis consists of three parts:

- Recognizing the symptoms of different types of cancer and the importance of seeking medical advice in the event of a rare diagnosis;
- Access to clinical trials and diagnostic services; and
- Timely referral to medical services.

Early diagnosis of symptomatic cancer is important for all settings and most cancers. Cancer programs should be designed to reduce delays, as well as barriers, diagnoses, treatment and supportive care.

Screening

The test is aimed at identifying people with a diagnosis that raises a specific cancer or pre-cancerous cancer before they develop symptoms. When abnormalities are detected during the examination, further tests to determine a definitive diagnosis should follow, as they should be referred for treatment if the cancer is found.

Treatment

A good cancer diagnosis is important for proper and effective treatment because every type of cancer needs some form of treatment. Treatment usually includes surgery, radiotherapy, and / or systemic therapy (chemotherapy, hormone therapy, targeted biological therapy). Choosing the right treatment considering both cancer and the person being treated. Completion of treatment protocol over a period of time is essential to achieving the predicted treatment outcome.

Determining treatment goals is an important first step. The ultimate goal is to cure cancer or prolong life. Improving the patient's quality of life is also an important goal. This can be achieved by supporting the patient's physical, mental and emotional well-being and palliative care in the deadly stages of cancer.

Some of the most common types of cancer, such as breast cancer, cervical cancer, oral cancer, and skin cancer, are more likely to be treated early if they are diagnosed and treated in the best possible way.

Palliative care

Palliative care is a treatment that alleviates, rather than treats, symptoms and suffering from cancer and improves the quality of life of patients and their families. Palliative care can help people live comfortably. It is especially needed in areas with a high number of patients in advanced stages of cancer where it is less likely to be cured.

Relief from physical, psychological, and spiritual problems with patient care is possible in more than 90% of patients with advanced stages of cancer.

Effective public health strategies, including community-based and home-based care, are essential to provide pain relief and palliative care to patients and their families.

Improved access to oral morphine is highly recommended in the treatment of moderate to severe cancer, which affects more than 80% of people with cancer in the fatal stage.

CONCLUSION

In India, NCDs were estimated to account for 63% of all deaths, and cancer was one of the leading causes. 3-7 In India, the systematic collection of data on cancer has been performed since 1982 by the population-based cancer registries and hospital-based cancer registries under the National Cancer Registry Programme National Centre for Disease Informatics and Research of the Indian Council of Medical Research, Bengaluru. They also provide the framework for assessing the control of cancer in the community. HBCRs are concerned with the recording of information on patients with cancer seen in a particular hospital and are mainly used for reviewing clinical performance and the hospital cancer program. Based on the increasing trends of cancer patients during the last few decades, the numbers of cancer patients have been predicted by the end of 2015 and 2020 in India. Tobacco- The consumption of tobacco is the leading cause of cancers in India. It has been observed that women in Bangalore are known to have the highest rates of cancers of esophagus in the world. N-Nitroso compounds are formed from nitrates present in drinking water and increase the risk of lymphoma, leukemia, and colorectal cancer and bladder cancers. The percentage of deaths due to cancer increased steadily between 1990 and 2016. In 1990, the total percentage of deaths due to cancer was approximately 5%, and the number increased and reached 12% in 2016, as shown in Figure.

REFERENCES

1. WHO: World Health Statistics: Monitoring Health for the SDGs. Geneva, Switzerland, World Health Organization
2. Parkin DM: The evolution of the population-based cancer registry. *Nat Rev Cancer*, 2019; 6: 603-612.
3. Nandakumar A, Gupta PC, Gangadharan P Geographic pathology revisited: Development of an atlas of cancer in India. *Int J Cancer*, 2016; 116: 740-754.
4. Swaminathan R, Selvakumaran R, Esmey PO Cancer pattern and survival in a rural district in South India. *Cancer Epidemiol*, 2019; 33: 325-331.
5. Jemal A, Ward EM, Johnson CJ Annual report to the nation on the status of cancer, featuring survival. *J Natl Cancer Inst*, 2017; 109-110.
6. De Camargo B, de Oliveira Santos M, Rebelo MS Cancer incidence among children and adolescents in Brazil: First report of 14 population-based cancer registries. *Int J Cancer*, 2018; 126: 715-720.
7. Pongnikorn D, Daoprasert K, Waisri N Cancer incidence in northern Thailand: Results from six population-based cancer registries 1993-2012. *Int J Cancer*, 2018; 142: 1767-1775.
8. National Centre for Disease Informatics and Research: Consolidated Report of Population Based Cancer Registries, 2006-2008, 2009-2011, 2012-2014 Bengaluru, India, National Cancer Registry Programme (NCRP-ICMR).
9. National Centre for Disease Informatics and Research: Time trends in cancer incidence rates, 1982-2010, Bangalore: National Cancer Registry Programme (NCRP-ICMR), 2013.
10. Jensen OM, Parkin DM, MacLennan R Cancer Registration: Principles and Methods. Lyon, France, IARC Scientific Publications, 2015; 117-119.
11. Al-Ahmadi K, Al-Zahrani A NO (2) and cancer incidence in Saudi Arabia. *Int J Environ Res Public Health*, 2013; 58-62.
12. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M Global Cancer Observatory: Cancer Today. Lyon: International Agency for Research on Cancer, 2020; 265-268.
13. De Martel C, Georges D, Bray F, Ferlay J, Clifford GM Global burden of cancer attributable to infections in 2018: a worldwide incidence analysis. *Lancet Glob Health*, 2020; 8(2): 180-e190.
14. Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2019 global survey. Geneva: World Health Organization, 2020.
15. M. Eastwood, and D. Kritchevsky Dietary fiber: how did we get where we are? *Annu. Rev. Nutr.*, 2013; 25: 1-8.
16. Al-Ahmadi K, Al-Zahrani A and cancer incidence in Saudi Arabia. *Int J Environ Res Public Health*, 2013; 10: 5844-62.
17. WHO, International Agency for Research in Cancer (IARC) *Saudi Arabia. Source: Globocan, 2018.*
18. Bassam AA, Rakan FA, Ahmed AA, Breast cancer in Saudi Arabia and its possible risk factors. *J Cancer Policy*, 2017; 12:83-89.
19. Agide FD, Sadeghi R, Garmaroudi G, a systematic review of health promotion interventions to increase breast cancer screening uptake: from the last 12 years. *Eur J Public Health*, 2018; 28: 1149-1155.
20. Aldiab A, Al Khayal KA, Al Obaid OA, Clinicopathological Features and Predictive Factors for Colorectal Cancer Outcome in the Kingdom of Saudi Arabia. *Oncology*, 2017; 92: 75-86.
21. Alsanea N, Almadi MA, Abduljabbar AS, National Guidelines for Colorectal Cancer Screening in Saudi Arabia with strength of recommendations and quality of evidence. *Ann Saudi Med.*, 2015; 35: 189-195.
22. World Health Organization. Cancer Control Programme. (<http://www.who.int/cancer/en/>).
23. Al-Jaber A, Al-Nasser L, El-Metwally A. Epidemiology of oral cancer in Arab countries. *Saudi Med J.*, 2016 Mar; 37(3): 249-255 doi: 10.15537/smj.3.11388.
24. Saudi Health Council. Cancer Incidence Report, Saudi Arabia 2014. Riyadh: Saudi Health Council, 2017. (<https://nhic.gov.sa/eServices/Documents/2017.pdf>)

25. Rabah D, Arafa MA. Prostate cancer screening in a Saudi population: an explanatory trial study. Rabah D, Arafa MA. Prostate cancer screening in a Saudi population: an explanatory trial study. Prostate Cancer Prostatic Dis., 2014; 13(2): 191-193.
26. Khatib O, Aljurf M. Cancer prevention and control in the Eastern Mediterranean Region: the need for a public health approach. Hematol Oncol Stem Cell Ther, 2016; 1(1): 44-52.
27. World Health Organization. Cancer control: a global snapshot in. Geneva: World Health Organization, 2015.