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Review Article

Cancer death scenario: A brief concept on cancer related deaths

Mukut Raj[1]*, Manu Priya[1], Hemant Kumar Singh[1], Suryakanta Swain[1]

[1] *Dept. of Pharmacy, School of Pharmacy and Paramedical Sciences, K. K. University, Nalanda, Bihar, India*

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ABSTRACT

A mass of aberrant tissue that has grown as a result of excessive, autonomous, and uncontrolled cell proliferation is known as a cancer, neoplasm, or tumour. The loss of the cell's regulatory system and an aberrant chromosome or DNA mutation are both contributing factors to this condition. Neoplasm refers to new growth, and neoplasia refers to the process of cell proliferation. Oncology, which derives from the Greek words oncos, which means tumour, and logos, which means study, is the area of medicine that deals with the thorough examination of a neoplasm (tumour), as well as its growth, diagnosis, and treatment. Generally, all malignant tumours are referred to as cancer. A safe and effective alternative for the treatment of tumours that produce granular exocytosis (perforin and granzymes) and death and do not respond to conventional treatment, cancer immunotherapy has emerged in recent years as two primary pathways implicated in CL-mediated tumour cell death. Treatments, including various ligand kinds, are briefly discussed before a comprehensive analysis of high aggressiveness. New immune modulators include immunotherapy, CTLA-4 blockers (cytotoxic T-lymphocytes unsupervised), and drugs involved in cell death during immunological cancer. Due to metastases from neighbouring organs and coexisting conditions such cirrhosis and chronic hepatitis, primary liver cancer is challenging to precisely diagnose after death. By altering the base rate or by influencing risk modification by sex and age, trends in diagnostic accuracy may have an impact on estimates of the radiation risk for liver cancer.

1. Introduction

Due to co-morbidities such chronic hepatitis and cirrhosis as well as metastases from neighbouring organs, primary liver cancer is challenging to precisely detected at death. By altering the background rate or by impacting risk modification by sex and age, trends in diagnostic accuracy may have an impact on estimations of the radiation risk for liver cancer. Besides phagocytes, mast cells, and dendritic cells, other cell types can also kill altered cells. It is unclear what exactly they do or what chemicals are employed. The basic mechanisms used by Tc and NK cells to kill their target cells are the same, despite the fact that they are activated by various receptors. The former is triggered by granule exocytosis [i.e., by perforin (PRF1) and granule-associated enzymes (granzymes; GZM)], whereas the latter is triggered by the death ligand/receptor system.[1] A rising body of research supporting the use of chemotherapy and androgen receptor signalling inhibitors (ARSIs) in the treatment of metastatic castration-resistant prostate cancer (mCRPC) has enriched the therapeutic picture over the past two decades. More recently, it has been demonstrated that certain subpopulations of patients with prostate cancer respond well to immunotherapy and PARP inhibitors.[2] primary factor in cancer-related fatalities. In Canada, breast cancer is the second most frequent cancer among women and the one with the highest incidence of new cases. It has been demonstrated that early identification of

* *Corresponding author*.
E-mail address: mukutraj007@gmail.com (M. Raj).

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adenomas/colorectal cancer and breast cancer saves lives and is cost-efficient. Since 1988, there have been organised programmes for finding breast cancer; by 2008, all of Canada had them, with the exception of Nunavut in the North. The majority of Canada currently has organised colorectal screening programmes in place, which first started there in 2007. The impact on patient outcomes is unknown, despite the fact that the suspension of cancer screening was thought to be vital in the early stages of the pandemic response.[3]

The 5-year overall survival of patients is still only around 50%, despite therapeutic improvements and growing understanding of the molecular causes and progression of oral cancer. Although it is simple to perform a direct visual examination of the oral cavity, most OSCCs are detected in an advanced stage. Surgery, radiation therapy, and chemotherapy are effective therapies for early oral cancer, however patients with metastatic oral cancer in its late stages frequently experience high mortality rates with few opportunities for effective treatments.[4] Reports from the World Health Organisation (WHO) and the International Agency for Research on Cancer (IARC) indicate that 8.2 million cancer deaths and 14.1 million new cases occurred in 2012. There are over 110 different forms of cancer that have been identified. Because of the rising number of immunocompromised people and the ongoing rise in treatment resistance to cancer, there has been an alarming rise in the incidence of cancer during the past 20 years.[5]

2. Causes of Cancer

The various factors affecting the cancers are described as follows;

Many different types of electromagnetic radiation, corpuscular (alpha and beta) radiation, low and high temperatures, mechanical trauma, and solid and gel materials are all examples of physical carcinogens. More specifically, the term is frequently used to describe solid and gel substances that are capable of causing cancer and are either insoluble in water or only tangibly soluble in water. In contrast to chemical carcinogens, both physical carcinogens and solid carcinogens have been widely used in an oversimplified manner to describe substances that cause cancer primarily, if not exclusively, through their physical properties and effects. Hard, soft, fibrous, non-fibrous, and gel materials are all examples of physical carcinogens. Turner's discovery that Bakelite discs implanted in rats caused local fibro sarcomas was the first scientific demonstration of the ability of physical factors to cause cancer. There have been a few anecdotal reports of tumours developing around foreign bodies, such as battlefield bullets.[6]

Epidemiological and/or experimental data are the foundation for the discovery of physical carcinogens. Using experimental models that are as similar to real-world scenarios as feasible helps with extrapolating experimental results to humans. Experimental inter tissue inserts composed of plastic or metal alloys can accurately mimic the surgical implantation of allogeneic prostheses in human bodies. Fibre particles, both hard and soft synthetic materials, and gels are examples of physical carcinogens. Physical carcinogens can be either manmade or naturally occurring. Chemical structures of physical carcinogens vary greatly, and many are not well understood. Furthermore, the manner in which they induce cancer is much more puzzling. There is no one established path that accurately describes how physical factors cause cancer. Cancer most likely results from a variety of different mechanisms. The fact that some physical carcinogens interact with genetics and other environmental factors to cause cancer further complicates the situation. Asbestos, for instance, has the ability to cause cancer on its own, but when mixed with cigarette smoke exposure, this potential is significantly increased.[7]

2.1. Chemical compound causing cancer

The bis (5,7,3′,4′epicatechin 4a,8-dimer from 5,7,3′,4′-tetra-O-benzylepicatechinand 5,7,3′,4′-tetra-O-benzyl-4-(2-hydroxyethoxy) epicatechin by replacing the previously employed Lewis's acid, titanium tetrachloride, with the clay mineral Bentonite K-10 has been reported as per the literature. The benzyl-protected all-4,8-trimer, -regioselectivitysynthesized from their lower homologues under the identical circumstances, albeit with progressively declining yields. 3-O-acetyl-4-[(2- benzothiazolyl)thio]5,7,3′,4′-tetra-O-benzylepicatechin was synthesized via the reaction of 2 with an organ aluminiumthiolate made from 2trimethylaluminiumutilizing this compound as the electrophile and silver tetra fluoroborate as the activator, medium-sized protected oligomers with 4aprocyanidinsdeprotection using ester saponification and hydrogenolysissynthesisedprocyanidins may be distinguished from cocoa fraction-isolated procyanidinsdimeric electrophile created by the self-condensation of compound 12 was used to show the notion of chain extension by two members. Multiple breast cancer cell lines are inhibited in their proliferation by pentamer 32, both synthetic and natural. It was determined that this result is based on the induction of cell cycle arrest in the G0/G1 phase using the MDA MB 231 line. Necrotic rather than apoptotic cell death is more likely to occur later. Control trials show that the causal agent is the polyphenol itself, not hydrogen peroxide that might be produced by its autoxidation.[8,9]

2.2. Biological compound causing cancer

Numerous microorganisms have been connected to or identified as being cancer-causing. H. pylori is the most

Table 1: Types and features of chemical agents and their mode of action causes cancer

Agent	Persistency	Rate of action	Mode of action	Physiological effects	Dispersal	Reference
Choking Agents						
Chlorine (Cl)	Low	Variable	Absorption through lungs	Fluid builds up in lungs, choking victim	Gas	9,10
Phosgene (CG)	Low	Delayed				
Diphosgene (DP)	Low	Delayed				
Chloropicrin (PS)	Low	Rapid				
Blister Agents						
Sulfur mustard (H, HD)	Very high	Delayed	Absorption through lungs, skin	Burns skin, mucous membranes and eyes; causes large blisters on exposed skin; blisters windpipe and lungs; large number of casual- ties, low percentage of deaths	Liquid, aerosol, vapor and dust	9,10
Nitrogen mustard (HN)	High	Delayed				
Phosgene oxime (CX)	Low	Immediate				
Lewisite (L)	High	Rapid				
Blood Agents						
Hydrogen cyanide (AC)	Low	Rapid	Absorption through lungs	Cyanide destroys ability of blood tissues to utilize oxygen, causing them to 'starve' and strangling the heart	Gas	9,10
Cyanogen chloride (CK)	Low	Rapid				
Arsine (SA)	Low	Delayed				
Nerve Agents						
Tabun (GA)	Low	Very rapid	Absorption through lungs (G-Series); contact with skin (VX)	Causes seizures, loss of body control; paralyses muscles, including heart and diaphragm; lethal doses can cause death in five minutes	Liquid, aerosol, vapor and dust	9,10
Sarin (GB)	Low	Very rapid				
Soman (GD)	Moderate	Very rapid				
Cyclosarin (GF)	Moderate	Very rapid				
VX	Very high	Rapid				
Riot Control Agents				Causes tears, coughing and irritation to eyes, nose, mouth and skin; constricts airway and shuts eyes (OC)	Liquid, aerosol	9,10
Tear Gas(CS)	Low	Immediate	Absorption through lungs, skin, eyes			
Pepper Spray (OC)	Low	Immediate				

well-known of these bacteria and is also the biggest known risk factor for stomach cancer. Only a small percentage of persons who contract the infection go on to develop stomach cancer or precancerous gastric tumours. This is attributed to a number of causes, including regional dispersion, tribe biodiversity, and environmental conditions. Additionally, H. pylori are linked to a higher chance of developing pancreatic cancer, which is hypothesized to happen as a result of the bacterium's pathophysiological effects. The theory that H. pylori are also marginally associated with an elevated risk of colorectal cancer is further supported by recent research.[10]

In 1911, the theory that a virus could cause cancer was put to the test. Rous was able to cause a rather quick development of the malignant condition by injecting a cell-free extract from a chicken sarcoma into a healthy fowl. A few years later, an active Rous sarcoma virus was discovered and characterised. Within 40 years, similar studies offered proof that six neoplastic illnesses in mammals and birds were caused by viruses. However, in the broad hunt for tumour viruses in animals, including humans, it is the research of the last 25 years that has brought viruses into the forefront. A substantial amount of evidence has been established by this research,which were carried out on both naturally occurring and laboratory-made malignancies.[11]

2.3. Environmental compound causing cancer

The three main groups of components that make up our environment are physical (energy in many forms), chemical (matter, or substances, whether created naturally or artificially), and biological (life beings). These risks can affect people in various ways, such as through the air, water, or soil. They have a highly complicated impact on human health, and it's possible that every sickness we have has some connection to the environment. Infectious agents, hazardous substances, environmental variables, physical

factors, and physiological stress all contribute to the development or progression of human disorders.[12] As per the report, 90% of breast cancers are environmental in origin and associated with a Western lifestyle, according to epidemiological research, although the exact causes have never been determined. The cloning of the breast cancer susceptibility genes BRCA1 and BRCA2 has helped to elucidate the genetic factors in those families at high risk of developing young-onset breast cancer, but only 5–10% of breast cancers result from these genes' loss of function, and the mechanism of susceptibility is still unknown.[13]

3. Types of Cancer and its Death Report

1. Nearly 10 million deaths will be attributed to cancer in 2020, making it the leading cause of mortality worldwide (1). Breast cancer (2.26 million cases), lungs (2.21 million cases), colon and rectum (1.93 million cases), prostate (1.41 million cases), skin (non-melanoma) (1.20 million cases), and stomach (1.09 million cases) were the most prevalent types of cancer in 2020.
2. Lung cancer claimed 1.80 million lives in 2020, followed by colon and rectum cancer (916 000 deaths), liver cancer (830 000 deaths), stomach cancer (769,000 deaths), and breast cancer (685,000 deaths). Every year, 400,000 or so children develop most cancers.
3. The most prevalent cancer type i.e., cervical cancer in the 23 nations as report.[14–18]

4. Mortality Rate Lung Cancer

1. In the US, lung cancer is the primary cause of death from cancer for both men and women. She overcame breast cancer in 1987, making it the main cause of death from cancer in women.
2. Lung cancer will cause an estimated 154,050 fatalities in the United States in 2018, or about 25% of all cancer-related deaths.
3. Deaths from lung cancer peaked in 2005 at 159,292, and since then have decreased by 6.5 percent, reaching 148,945 in 2016.
4. Men (46.7 per 100,000 people) had a higher age-adjusted lung cancer mortality rate than women (31.9 per 100,000 people). Overall, it is comparable for whites (39.5 per 100,000) and blacks (40.0 per 100,000). However, compared to white males, black men have a significantly higher age-adjusted mortality rate from lung cancer, but the mortality rates for black and white women are comparable.
5. In the European Union (EU), tobacco usage is one of the largest health dangers that can be avoided. Tobacco usage is linked to several types of cancer, cardiovascular, and respiratory diseases.
6. Around one-fourth of all recorded deaths in the 26 EU Member States for which data are available for 2016 were related to cancer. 21% of all cancer-related fatalities were caused by lung cancer.[19]
7. In 2016, Hungary had the highest rate of lung cancer among all malignancies that were fatal (27%) and was followed by Poland, Greece, and the Netherlands.[20]

5. Dying from Liver Cancer

The 3rd National Cause of Death Survey in China (People's Republic of China Ministry of Health, 2008) provided information on cancer mortality. In a nutshell, from 2004 to 2005, a retrospective survey was undertaken in 53 high-cancer areas and 160 randomly chosen districts. Based on 160 randomly chosen districts, our study's estimation of liver cancer mortality used this data. Since there were no data on cancer incidence for the entire nation, the mortality/incidence ratio (M/I) and mortality information were used to estimate cancer incidence. The M/I ratio was computed using Poisson regression adjusted for age, sex, and cancer registry site using information from 32 regional population-based cancer registry sites in China between 2003 and 2004.[21]

6. Loss of Life Due to Cervical Cancer

The cervix, a woman's entrance from the vagina to the uterus, is where cervical cancers grow. High-threat human papillomaviruses (HPV), a common place virus spread through sexual contact, are implicated in nearly all cervical cancer cases (99%).[22] Although the majority of HPV infections resolve spontaneously with no symptoms, ongoing HPV contamination can cause cervical cancer in females. The fourth most common disease in women, cervical cancer, is not uncommon. Globally, 570 000 women were anticipated to be diagnosed with cervical cancer in 2018, while 311 000 women worldwide passed away from the disease.[23]

7. Breast Cancer-related Death

Most occurrences of cervical cancer can be prevented with primary (HPV vaccine) and secondary prevention strategies (screening for and treating precancerous lesions). In the United States, it is anticipated that 287,850 women will receive an invasive breast cancer diagnosis this year, while 51,400 women will receive an in situ (non-invasive) breast cancer diagnosis. Invasive breast cancer in women has increased by roughly 0.5 percent annually since the middle of the 2000s. This year, aggressive breast cancer will likely be discovered in 2,710 men in the US. In the United States, there will likely be 530 men and 43,250 women who pass away from breast cancer this year. Female breast cancer is the sixth most common cause of mortality in the world. Around the world, 684,996 women are anticipated to pass

away from breast cancer in 2020.[24]

Leukaemia, lymphoma, myeloma, and myelodysplastic syndromes (MDS) are cancer types that can affect the bone marrow, blood cells, lymph nodes, and various lymphatic system components. Death due to blood cancer This figure equates to more than six people each hour, or around 158 people per day.

In the US, 57,750 fatalities are projected to be caused by leukaemia, lymphoma, and myeloma in 2021.

Based on an estimated total of 608,570 cancer deaths in 2021, it is anticipated that these diseases would cause 9.5% of cancer-related deaths.

In the US, it is estimated that leukaemia would be responsible for about 23,660 deaths in 2021 (13,900 of them male and 9,760 of them female).

Between 2013 and 2017, leukaemia was the sixth most common cause of cancer deaths in adult males and the seventh most common cause of cancer deaths in females in the US.[25]

Immunotherapy: Our immune system is used in immunotherapy to combat cancer. For some cancers, it is a conventional treatment, and trials are ongoing for additional cancers.

Personalized medicine involves using information about a person's cancer to help diagnose, treat, and find out how well treatment is working.

Bisphosphonates: Find out how bisphosphonates function and any potential adverse effects.

Added therapies: This is the process of treating cancer with medical technology (interventional treatments), such as chemotherapy, laser therapy, and photodynamic therapy.[26]

Alternative and complementary medicine

It's commonplace to use the words complementary remedy and opportunity remedy interchangeably. Additionally, they will all be referred to as complementary and alternative treatments (CAMs). Population affected by different types of cancer within last five years as shown in Table 2 and its graphical representation are shown as Figure 1.

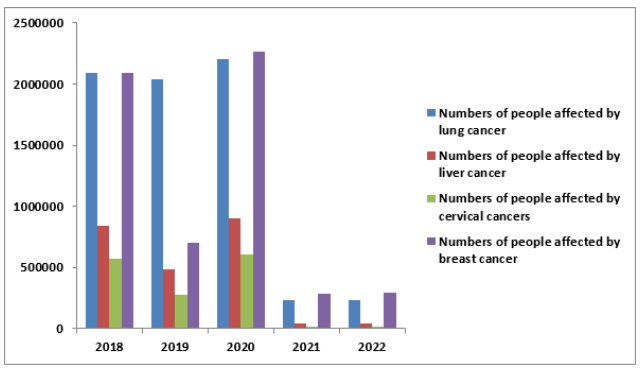

Figure 1: Graphical representation of population affected by various cancer from 2018-2022

8. Symptomatic Cancer Treatment

In superior cancer, palliative remedy may assist a person to stay longer and extra comfortably, even supposing they can't be cured. The palliative care crew can help human beings with any degree of most cancers and assist with signs and symptoms or aspect results of treatment. There are numerous choices to be made approximately a most cancers remedy earlier than you may have it at the NHS.[32]

9. Death Scenario of Cancer

Cancer is one in every of the most important fitness problems. Fifty-six million humans died upfront due to most cancers in 2017. Every six death in the world is due to cancer. The global burden of disease is a major risk factor for death and disease posted with inside the scientific magazine The Lancet. Cancer is the main reason for demise worldwide, accounting for almost 10 million deaths in 2020.[19]

The body parts which are affected or infected by cancer in 2020 (in phrases of latest instances of cancer) were:

1. Breast (2.26 million instances);
2. Lung (2.0ninety three million cases);
3. Prostate (1.0 forty-one million cases);
4. Skin (non-melanoma) (1.20 million cases); and
5. Stomach (1.09 million cases).
6. The leading causes of cancer death in 2020 were:
7. Lungs (1.80 million deaths),
8. Colon and rectum (916,000 deaths),
9. Liver (830,000 deaths),
10. Stomach (769,000 deaths), and
11. Breast (685,000 deaths).

Apart from these, 4 million kids are identified with cancer symptoms every year. The most common types of cancer differ among countries. The most common cancer in 23 countries is cervical cancer.[18]

10. Death Due to Lung Cancer

1. In the US, lung cancer is the primary cause of death from cancer for both men and women. She overcame breast cancer in 1987, making it the main cause of death from cancer in women.
2. An estimated 154,050 Americans will die of lung cancer in 2018, accounting for approximately 25 percent of all cancer deaths.
3. Deaths from lung cancer peaked in 2005 at 159,292, and since then have decreased by 6.5 percent, reaching 148,945 in 2016.
4. Men (46.7 per 100,000 people) had a higher age-adjusted lung cancer mortality rate than women (31.9 per 100,000 people). Overall, it is comparable for whites (39.5 per 100,000) and blacks (40.0 per 100,000). However, compared to white males, black

Table 2: Population affected by different types of cancer within last five years

Sl. No	Years	Numbers of people affected by lung cancer	Numbers of people affected by liver cancer	Numbers of people affected by cervical cancers	Numbers of people affected by breast cancer	Reference
1.	2018	2093876	841080	569847	2088849	[27]
2.	2019	2,040000	484577	280479	700660	[28]
3.	2020	2,206,771	905,677	604,127	2,261,419	[29]
4.	2021	235760	42230	14480	284200	[30]
5.	2022	236740	41260	14100	290560	[31]

Table 3: Reported Death scenario of cancer diseases in population wise countries across globe

S. No	Name of the country	Total population size till 26/06/2023	Number of Male patients affected	Number of Female patients affected	% mortality rate of male & female
1.	Denmark	5852704	22,380	20,511	0.7328
2.	Ireland	5101666	17,453	14,402	0.6244
3.	Belgium	1167697	44,452	38,815	7.1308
4.	Hungary	9587645	33,711	33,163	0.6975
5.	France	6570186	260,169	207,796	5.9691
6.	Netherlands	1724731	71,934	60,080	7.6541
7.	Australia	26378182	109,018	91,003	0.7582
8.	Norway	5547152	18,862	16,040	0.6291
9.	Slovernia	2079784	8,011	6,069	6.7699
10.	USA	3676717	1,226,541	1,055,117	62.0569
11.	India	1428627663	712,176	749,251	0.10229

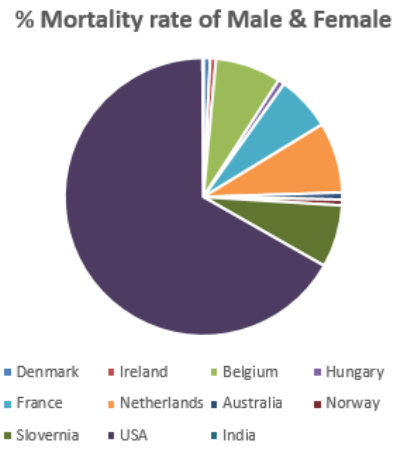

Figure 2: Percentage of mortality rate of male and female of top 10 cancer affected different countries.

men have a significantly higher age-adjusted mortality rate from lung cancer, but the mortality rates for black and white women are comparable.[19]

11. Death Due to Liver Cancer

The 3rd National Cause of Death Survey in China (People's Republic of China Ministry of Health, 2008) provided information on cancer mortality. Briefly, this was a retrospective survey conducted in 160 randomly selected districts and 53 high cancer areas from 2004 to 2005. Based on 160 randomly chosen districts, our study's estimation of liver cancer mortality used this data. Since there were no data on cancer incidence for the entire nation, the mortality/incidence ratio (M/I) and mortality information were used to estimate cancer incidence. The M/I ratio is derived from information of 32 local populations based primarily on most cancer registry websites in China from 2003 to 2004 and calculated using Poisson regression adjusted for age, sex, and cancer registry site. The death scenario as given in the Tabular form as in Table 3 and Graphical representation as shown in Figure 2.

12. Conclusion

According to the NCI, cancers are a group of disorders in which aberrant cells have the ability to proliferate and spread to neighbouring tissue. A variety of cancer kinds can develop from cancers that start in different sections of the body and occasionally spread to other bodily regions via the lymphatic and circulatory systems. We give a brief summary report of the entire globe, especially male and female infected person along with the mortality rate of every kind of cancer on this review article.

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14. Conflict of Interest

The author said no conflicts of interests.

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Author biography

Mukut Raj, Assistant Professor

Manu Priya, Assistant Professor

Hemant Kumar Singh, Assistant Professor

Suryakanta Swain, Professor

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