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Meddling of Viral Genome can Contribute Cancer by Cumulating the Global Burden

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Abstract

Cancer is the one of most leading cause of death and fast growing disease with increase its global burden due to cancer causing behavior particularly smoking, drinking alcohol coal mining worker, consumption of non-organic foods, uses of non-food grad utensils and uses of food additives. About 13.5 million case of cancer have been reported worldwide in which 7.8 million deaths occur. Out of 7.8 million mortality rate 73% death cases have been reported in poor or middle socio-economic countries. Where population are unaware, poor sanitation and lack of hygiene. Cancer is the most sever and life threatening disease which cause millions of death worldwide. It has high mortality rate that's vary country to country and 2 million cases are occur in the world each year. In which most of the cases of breast cancer are reported. There are numerous risk factors which are responsible and associated with different types of cancer, such as Nickle, asbestos, metallic ores containing radioactive substances, atmospheric carcinogen and cigarette smoking have been associated with lung cancer. Mortality rate of breast cancer is higher in upper socioeconomic group or Jewish women. Uterine cervix cancer is determine as second most common and have been reported as higher mortality rate. It has found in lower class or low socioeconomic group due sophisticated activity.

Advanced countries are highly at risk of prostate cancer as compare to low status country like Asia, Latin America and Africa. Verity of viruses have been reported in number of cancer such as leukemia, burkits lymphoma, Merkel cell carcinoma, cervical cancer, Hodgkin's lymphoma, post-transplant lymphoma, nasopharyngeal carcinoma, Kaposi's sarcoma, primary effusion lymphoma and triggered Liver cancer etc. Global burden of cancer could be control or prevented by advance applications, upgrade clinical practices, develop policies, plans for cancer control program and provide access to advance technologies and equipment. Enhance research centers to create or promote innovative treatment and diagnosis for cancer patients. CDC, WHO and FDA should be create cancer control center or program on national level and these center should have be well educated staff. Organization must be update report from these center and create data-base for cancer patient which easily classify old and new cases of cancer. Start campaign door-to-door by print media, social media and through cyber networks.

Keywords: Drinking alcohol; Uterine cervix; Hodgkin's lymphoma

Introduction

Cancer word is derived from 'Greek' language word 'karkinos' which means crab and 'Onkos' means tumour. The study of cancer is called oncology. Cancer is abnormal division of cells or over production of cells is called cancer. As we know that our body is made up of trillion of cells and each cell perform and control the all normal activities of our body. Normal cells grow and divide into two cells according to nature rule. Division takes place by natural process which is called mitosis. When these cells are die, they replace by other new cells. But sometime, something goes wrong within cells. These cells are multiplying out of control or loss of cell control receptors and formed lumps (tumour). Tumour is cluster of cells or abnormal functionless mass of cells is called is tumour. This abnormal division of cells occurred by error, mistakes or external factors interference. It may be caused by certain factors and these factors can be environmental pollutants, radiations, viruses, chemicals, DNA-mutations and certain dyes. Cancer might be cause by genetically or heredity material from parent to offspring. Cancer is not transmit through combine eat, drinking, close contact and share utensils. In which 72% death cases were reported in middle or poor socioeconomic countries. It is estimated that in 2030 the rate of cancer will be raised up to 11.4 million Deaths [1].

Wide-ranging sign and symptoms are abnormal bleeding, prolong cough, change in bowel moments, lumps and weight loss etc. It may be occur due to larger mass of tumour or ulceration, e.g. there is a condition in lung cancer mass may be effect/formed and block the bronchi in result coughing or pneumonia began, in esophageal cancer by which esophagus is narrowing and feel pain or trouble in swallowing. The obstruction or narrowing of bowel of gut in colorectal cancer. Ulceration can caused bleeding in cough if it is occur in lung, if ulceration occur in bladder it lead to discharge of urine

containing blood in uterus to vaginal bleeding. Fluid is build-up in abdomen and in lunge by specialized type of cancer. There is no metastatic spread but these may include; fever, changes in skin pigment, leukemia's, excessive fatigue while liver and kidney cancer may cause persistent fever/temperature [2]. In simple, spreading of cancer from one organ to another organ *via* lymph nodes and hematogenous means *via* blood. Metastasis can depend on location of the organs such as enlarge liver, enlarge lymph nodes, and enlarge spleen.

Literature Review

Reason for the tumour production

Scientists uncertain to why normal cell multiply rapidly even without control however they know that there are carcinogens that are interfere with cell which result cell loss its control or switch factors and multiply promptly. Who estimated that 70%-90% carcinogens which are responsible for human cancer. These are;

- Hydrocarbon is found in cigarette smoke.
- Environmental factors.
- Pesticides/dyes if use in food products.
- Radiations such as X-rays and UV-rays.

Viral genome interference clue to cancer

Viruses are found in the development of cancer its rate about 15% worldwide because viruses are only infectious agents that play a key role in the development of cancer by changing in genetic material of human cells, while itself cancer is not infectious disease. Generally these viruses are called oncogenic viruses or tumour viruses but there are numerous other factors that are also play role in progression of cancer. Viruses are consider as carcinogens that can cause cancer [3]. Experiment was done on animals in which some viruses induced the formation of tumour. Large number of viruses have been isolated from human cancer [4]. These viruses are segregated in human cancer Herpes simplex virus HSV is associated with human cervix, Epstein barr virus is related with burkits lymphoma (tumour of Jew) and some Hodgkin's lymphoma, post-transplant lymphoma, nasopharyngeal carcinoma, Hepatitis B Virus (HBV) is linked with Liver cancer, Kaposi's Sarcoma Herpesvirus (KSHV) causes Kaposi's sarcoma, primary effusion lymphoma, Human T-Lymph Tropic Virus-1 (HTLV-1) associated with Adult T-cell leukemia, Merkel Cell Polyomavirus (MCV) source of Merkel cell carcinoma, Hepatitis C Virus (HCV) is triggered Liver cancer, Human Papillomavirus (HPV) isolated from cervical cancer [4,5].

Discovery of the proto-oncogenes and oncogenic theory accompanying with viruses

Viruses are interfere with proto-oncogene it may provide unique genetic code that stimulate or enhance the uncontrolled cell division. They may be programed or may developed cell protein receptors that receive extra cellular messages/signals. They may transmit nuclear at high level which cannot turn-off the cell growth. They may insert its genome into host cell genome and shuffle its sequences which result tumour suppressive genes are also change its position. Viruses may assimilate venomous sequence at nearby of control genes and disturb its arrangement [8]. Reyton Ross was American physician who determine the tumour in chicken by preparing mash-up of connective tissue of particular chicken and allow to apply bacteriological filter again injected into healthy chicken become cancerous [6]. In 1980s Robert-T-Gallo isolated T-lymphocytes from malignant T-cells found in rare cancer called T-cells leukemia. Gallo differentiate virus RNA containing Retroviruses called human T-lymphocyte virus and isolated from AIDS patient in 1990 the evidence has strengthen which can cause leukemia and neurological pain disorder [7,11]. It was unknown that how virus and other carcinogens convert normal cell into tumour cells until the development of oncogenic theory this is called oncogenes which are normally reside in the DNA chromosome. Oncogenes was discovered by M.J Bishop and H. Varmus in wide verity of fruit fly into human [9].

They also determined same genes exist in viruses and hypnotized that viruses captured these genes from fruit fly or humans but at the end they prove that oncogenes are not viral origin. It can be part or fragment of genetic dowry of the cell. Finally discovered that cancer is based on genetic bases [11]. More than 60 Oncogenes are isolated from urinary bladder. In the current year oncogenic theory is revised and researcher propose that normal gene call proto-oncogenes. Proto-oncogenes are set of nucleotide bases normally present in genetic material of the cell. Proto-oncogenes has two copies in cell which works together if 1 copy become mutated or impairment due to external factors than individual develop cancer later years. Proto-oncogenes are regulate the mitosis and growth of the cell. In 1985 researchers linked proto-oncogenes with CAMP which is organic compound and perform many physiological processes. They specified that proto-oncogenes can be convert into oncogenes by certain agents such as radiations, viruses, chemicals, breakage and rearrangement of chromosome [8]. These proto-oncogenes are diverse in species to species because 1 nucleotide is change in 16000 nucleotides. Altered oncogenes are isolated in different cells of the body the proto-oncogenes of urinary bladder is unlike from Burkits jaw lymphoma. Viruses are trigger proto-oncogenes of the cell form position 8 to new positon 14 which is far from control genes known as tumour suppressor gene that normally control the cell division. Once proto-oncogenes become oncogene in their result individual grow dissimilar cancer [9].

Epidemiological view of common sorts of cancer

Cancer is the one of most leading cause of death worldwide that is interpreted for 7.5 million deaths worldwide. These are main categories of cancer: Colorectal (539,000 deaths/year), Stomach (703,000 deaths), Breast (619,000 deaths), Lung (1.4 million deaths), Liver (710,000 deaths).

Class of tumour viruses

There are two major class based on genetic material such as RNA and DNA viruses and these both classes are responsible for cause of cancer [6]. Verity of viruses contributing cancer in

humans as well as in animals. These are some common viruses that frequently found in human cancer and they are seclusion with each other's (**Table 1**).

Causative agents	Targeted organ	Death rate or cases worldwide/ year	Tumour virus discovery	Immunization/ vaccine
Hepatitis B Virus (HBV)	Liver cancer	345000	1965	Yes
Kaposi's Sarcoma Herpesvirus (KSHV)	Kaposi's sarcoma, primary effusion lymphoma	68000	1994	No
Human T-Lymphtropic Virus-1 (HTLV-1)	Adult T-cell leukemia	3300	1980	No
Merkel Cell polyomavirus (MCV)	Merkel cell carcinoma	No data	2008	NO
Epstein-Barr Virus (EBV)	Most Burkett's lymphoma; some Hodgkin's lymphoma, post-transplant lymphoma, nasopharyngeal carcinoma	121000	1964	No
Hepatitis C Virus (HCV)	Liver cancer	205000	1989	No
Human Papillomavirus (HPV)	Cervical cancer	497000	1983	No

Table 1: Discovery, mortality rate, immunization and viral association with cancers.

Discussion

Cancer is treated with numerous types such as chemotherapy, radiation therapy, surgery, immunotherapy, targeted therapy and hormonal therapy, etc. clinical trial maybe best option for cancer treatment. Treatment is depend upon the patient condition and a particular type cancer, you may receive one treatment or receive combine treatment [2,10].

- The aim of primary treatment is remove or kill the cells of the cancer from patient body completely. It is done with mostly by surgery.
- The purpose of adjuvant therapy is killing of those cells that are remained after primary therapy.
- Radiation therapy is used to kill or reduce the number of cancerous cells. Basically it is perform by the machine that apply rays upon the body by external beam radiation. Radiation uses high powered energy beams such as x-rays and protons to reduce/kill the cancerous cell but their many side effect are reported and may not successful [11].
- The goal of this treatment remove those cell or organs of the body which is infected by cancer. It is perform by specialized sterile equipment's under the controlled and aseptic condition.
- Chemotherapy is first choice to treat the cancer and reduce the effect and progress of cancer. This is included medication and other chemical treatment.
- Immunotherapy or biological therapy is uses the body immune system to fight or modified it to kill the cancer cells. In cancer the immune system of the body cannot recognize cancer cells and without unchecked cancer cells are survive in the body therefore, immunotherapy is introduce to cancer suffering patient body to see the cancer and attack or kill them.
- Radiofrequency are electrical energy that passes heat to cancer infected tissues and kill them safely. It is perform by the injecting thin needle. By the applying electrical heat through an incision to the infested organ or tissue and kill the tumor cells.
- It is uses of for special types of cancer such as breast cancer and prostate cancer. In which blocked the release of such hormones to reduce the risk of cancer.

Conclusion and Recommendations

Many peoples are suffering from cancer world-wide with an array of symptoms. Provide Key component of any overall cancer and developed control plan for the treatment to reduce cancer. Diagnosis and treatment must be effect and provide longer benefits to cancer patients. Developed strategies, start campaign about control and prevention of cancer. Must be start awareness programed to educate peoples *via* media social networks and also print media. Cancer control centers must be provided on district, tehsil hospital level which provide guideline and aware about cancer prevention and risk factors. New systems must be established and tested. Advance techniques and methods must be applied to control the cancer. Provide clinics for researcher or medical oncologist where they perform experiments and develop novelty in cancer treatment. Private and public sectors must be increase their support in cancer registration. Improve the national wise reporting systems and handle the record of patients properly. Government should reserve funds for cancer center that ongoing provide healthcare to the patients. Hospital staff must be trained and provide welcome context to patients.

References

1. Sanders JM, Wampole ME, Chen CP, Sethi D, Singh A, et al. (2013) Effects of hypoxanthine substitution in peptide nucleic acids targeting KRAS2 oncogenic mRNA molecules: Theory and experiment. J Phys Chem B 117: 11584-11595.
2. Pasqualini CD, Ruggiero RA, Bustuoabad OD, Nepomnaschy I, Piazzon I (2005) Experimental onco-immunology revisited. Curr Cancer Ther Rev 1: 289-298.
3. Wild C, Weiderpass E, Stewart BW (Eds.) (2020) World cancer report: Cancer research for cancer prevention. IARC Press.
4. Gross L (1974) Facts and theories on viruses causing cancer and leukemia. Proceed Nat Acad Sci 71: 2013-2017.
5. Wong-Staal F, Gallo RC, Gillespie D (1975) Genetic relationship of a primate RNA tumour virus genome to genes in normal mice. Nature 256: 670-672.
6. Lau L, Gray EE, Brunette RL, Stetson DB (2015) DNA tumor virus oncogenes antagonize the cGAS-STING DNA-sensing pathway. Science 350: 568-571.
7. NTP (National Toxicology Program) (2016) Report on carcinogens (Fourteenth ed.). research triangle park, NC: U.S. Department of health and human services, Public Health Service.
8. Levine AJ (2009) The common mechanisms of transformation by the small DNA tumor viruses: The inactivation of tumor suppressor gene products: p53. Virology 384: 285-293.
9. Rous P (1911) A sarcoma of the fowl transmissible by an agent separable from the tumor cells. J Experim Med 13: 397.
10. Antman K, Chang Y (2000) Kaposi's sarcoma. N Engl J Med 342: 1027-1038.
11. Gallo RC (2005) History of the discoveries of the first human retroviruses: HTLV-1 and HTLV-2. Oncogene 24: 5926-5930.