

Innovative Cancer Treatments

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Abstract

Cancer is a one of the dreadful diseases, which is characterized by uncontrolled cell division. There are about 100 different types of cancer. Each cancer is classified by the type of the cell it affects. The tumor which affects the cancer cell is called as malignant tumor. Cancer usually invades and spreads to all body parts. Non-cancerous tumors are called benign tumors. Tumors are undifferentiated mass of the cells which divides uncontrollably. There are many factors which causes cancer. Cancer is usually caused by tobacco consumption. Obesity, poor diet, hereditary, genetic mutations hormonal changes. The gene which gets mutated and cause cancer is called oncogene. Cancer is treated by many drugs, surgery, chemotherapy, radiation therapy, targeted therapy, hyperthermia. Abuse of cancer drugs causes severe side effects like alopecia, nausea, loss of appetite, loss of body weight. Hence, alternative and innovative treatment must be followed.

Keywords: Cancer; Drug therapy; Adverse drug reactions

Introduction

Cancer has become of the dreadful diseases of all times. Despite discovery of drugs, and invention of other alternative to treat cancer, the mortality rate of cancer has been increasing. Innovative cancer treatment involves treatment of cancer by innovative methods, which would decrease the side effects and also increase efficiency in curing cancer. Some of the innovative cancer treatments are gene therapy, immunotherapy, hormone replacement therapy, targeted drug delivery systems; Cancer vaccines are one of the innovative cancer therapies which would treat cancer in an effective way [1].

The innovative cancer therapies are interesting besides being challenging too. Some of the innovative cancer drug therapies are gene therapy, laser therapy, application of nanotechnology (nanoparticles therapeutics), RNA interference therapy, photosensitizer and hyperthermia.

Gene therapy

Gene therapy is one of the recent technologies, which involves insertion of desired genetic material into Cancerous cell. This process is done to restore the missing gene, or to replace the mutated gene.

As the gene therapy is one of the best ways in treating cancer it is still in clinical trials phase. Gene therapy is a process of modification of cancerous cell at a molecular level. Vector is used to transfer the modified gene. Vector is after integrating into the DNA gets integrated in chromosome. This kind of gene therapy could also be used in treating other genetically related diseases. The overall process of integration of virus into cellular DNA, leading to the delivery of desired genetic Material is called as integration. This process sometimes may or may not alter host's genetic material [2,3].

Scientific era has a significant growth over the last few years, and special emphasis has been given to gene therapy, Nano gene therapy.

Somatic gene therapy also is one of the new techniques which are also used for the treatment of cancer. Recent trend in somatic therapy focuses on the introduction of transgene into defective somatic gene therapy. The mechanism of action of the vector is usually suits for epithelial cells and thus leading to injecting of genome into the cancerous cell.

Laser therapy

The term laser stands for light amplification by the stimulated emission of radiation. Laser therapy of treating cancer, includes, special light beam instead of instruments, laser therapy is also one of the nascent technologies, which is also used in the treatment of Cancer. Laser therapy is usually given through a thin tube called an endoscope. There are different types of laser therapies used for treatment of cancer, they are, carbon dioxide, neodymium: yttrium-aluminum garnet, argon laser treatment, and laser induced interstitial thermotherapy [4].

Endoscope is inserted in the body to treat cancer or precancerous growth. Laser therapy usually causes less bleeding and it also causes fewer damages to normal tissue. Yet, it is not permanent.

Laser therapy requires high intensity light to treat cancer. Laser can also be used to shrink or destroy tumors or precancerous growth. Laser therapy is usually given.

Many types of cancer can be treated with laser therapy; some of them are vocal cord cancer, cervical cancer, skin cancer, lung cancer, vaginal cancer, penile cancer [5].

Applications of Nanotechnology (Nanoparticles Therapeutics):

Nano particles range from 1-100nm. Application of nanotechnology in treating cancer has become one of the emerging trends. Clinical trials reveals that, treating cancer by nanoparticle can enhance the efficiency of the treatment and it could also minimize the adverse effects. The property of nanoparticles in treating cancer is,

target specific, and active cellular uptake. Nanoparticles also target uncontrolled cell proliferation.

RNA interference therapy

RNA interference therapy has got a significant importance in recent era. The mechanism behind RNA Interference is not fully understood, but it was observed that, gene silencing effects occur, after the process of transcription. It could be explained as ds RNA which was created to target the introns are spliced out of mRNA. The main process of RNAi is cutting of dsRNA into smaller pieces of desired length by using appropriate enzyme. The enzyme used in this process is called as Dicer. Dicer cleaves double stranded RNA into two small RNAs microRNA (MiRNA) and small interfering RNA. MiRNA Stops protein production, RNA dependent on the sequence specific interactions between SiRNA and MRNA. RNAi silences expression gene [6].

Photosensitizer therapy

Photodynamic therapy is a treatment which uses a drug called a photosensitizer or photosensitizing agents. Photosensitizing agents and particular type of light are exposed at a specific wavelength. The specificity of wavelength is depended on the production of oxygen. Oxygen destroys nearby Cancer cell. The wave length determines the distance travel by the light into the body. The mechanism of action of Photosensitizer is injecting photosensitizer into the body. Cell absorbs the agent and retains the agent in the cell. Cancerous cell retains the agent for a longer time. Then the cancer cell is exposed to light. The photosensitiser in present in tumor absorbs the light produces oxygen which destroys surrounding cancer cells [7].

Hyperthermia

One of the novel oncological therapies is Hyperthermia. It mainly involves, exposing the cancerous cells to heat, or fire or exposing to natural sun light. Though it has been used in households, and it is not

being used clinically across the world. As the method is new, many professional rejected and it was further considered as the discovery of electromagnetic heat delivery has come into existence. There are significant results which show the effect of hyperthermia approach in treating cancer. The hyperthermia technology has to develop in aspects of improving good heating techniques; powerful energy delivery has to be improved [8].

Conclusion

Initial stage of detecting cancer, could be cured and decrease the mortality rate. However, unfortunately mortality rate has been improving because of lack of proper diagnosing methods and also ineffective chemotherapeutic treatment. As synthetic drug causes many side effects, and the cancerous cells become resistance to the synthetic drug. Innovative cancer treatment must be considered. The usage of innovative cancer treatment not only decreases mortality, but also effective treatment of cancer could be done.

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