An Emerging Platform for the Treatment of Stomach Cancer: Novel Drug Delivery Systems

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Abstract

Given that it claims the lives of so many people every year, cancer has long been considered one of the most lethal diseases in the world. The frequency of fatal cases of stomach cancer has recently increased significantly. Given its low overall survival rate and continued ranking as one of the most lethal cancer types, it urgently needs treatment. Possibly one of the most challenging aspects of the battle against stomach cancer is early identification and adequate therapy. In this article, we concentrated on curative strategies for the treatment of stomach cancer and covered in great detail the most recent developments and improvements of systems based on nanotechnology for contemporary medication delivery and treatments. Aiming to increase cellular uptake, pharmacokinetics, and anticancer drug efficacy, recent therapeutic strategies in nanotechnology-based drug delivery enable more precise targeting of particular agents for efficient stomach cancer treatment. The current review also includes information on ongoing studies intended to increase the therapeutic potency of current anti-stomach cancer drugs. Readers trying to create multifunctional nano-constructs for better diagnosis and treatment of stomach cancer will find all these important topics covered less than one general heading to be of the utmost value.

Keywords: Stomach cancer • Pathophysiology • Novel drug delivery systems • Therapies

Introduction

The third most significant global cause of illness and mortality is stomach cancer. The morphologic variations of stomach cancer, sometimes referred to as gastric cancer, are quite diverse. According to age-related specificity, stomach cancer begins at age 40 and reaches its peak at age 75. Despite a decline in occurrences of stomach cancer in some regions, there are more than a million new cases and more than 78, 4000 fatalities worldwide each year, according to reports. The decrease in active stomach cancer and death is typically attributed to a variety of causes, including a decrease in the consumption of salted, Increased intake of fresh fruits and vegetables, and decreased consumption of items that have been pickled, smoked, or chemically preserved. Helicobacter pylori are the primary initiator and cause of stomach cancer.

For non-cardia gastric cancer, H. pylori are a recognized carcinogenic factor. It's interesting to note that there is a wide regional difference in the prevalence of stomach cancer, with Eastern Asia, the Pacific Coast of Southern America, and Eastern Europe having the highest rates and North America having the lowest rates. There is a clear clustering of stomach cancer cases in the Northern part of Europe, Australia, and a few other nations. Geographic invariancy is still at its highest point, notwithstanding a reduction in age-adjusted incidence rates over the previous three to four decades. It has been shown that men are more likely than women to get stomach cancer. This might be due to several risk factors, including smoking, stress at work, an unbalanced diet, or certain hormonal conditions. The prevalence of high-quality, better meals and other factors like higher economic position and sanitary habits may all contribute to a decline in stomach cancer rates. The choice of pharmacological therapy based on clinical patient studies is crucially dependent on current advances in targeted therapy and molecular profiling.

Conclusions and future perspectives

Among the many different cancer kinds, stomach cancer has a high mortality rate. Any efficient cancer therapy has as its main objective the elimination of cancerous cells with the least amount of damage to healthy cells. The fact that stomach cancer-related mortality is still high despite significant advancements in cancer treatments and adjuvant therapies shows that more research is still needed to develop therapies. In this overview of stomach cancer, we focused largely on several potential treatment approaches and initiatives to develop novel, affordable medications for treating and controlling the disease. To successfully eliminate stomach cancer, the present evaluation recommends using cutting-edge medication delivery methods and effective systems, such as combining radiation, immunotherapy, gene therapy, and other therapeutic techniques with nanotechnology-based approaches. The most effective method for treating stomach cancer may be a mix of localized treatment and tumor targeting. As a whole, these innovative nanocarrier-based therapeutic systems containing anticancer medications may provide the most convenient option for drug localization and delivery to targeted sites. These delivery techniques effectively halt the progression of cancer cells while also aiding in their apoptosis.