American Journal of Preventive Medicine and Public Health, 2022
VOL 8, NO. 6, PAGE 01-02

COMMENTARY

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Promising Results from the Pancreatic Cancer Vaccine Trial

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ARTICLE HISTORY

Received: 10-May-2022, Manuscript No. AJPMPH-22-67919; Editor assigned: 12-May-2022, PreQC No. AJPMPH-22-67919(PQ); Reviewed: 27-May-2022, QC No AJPMPH-22-67919; Revised: 02-Jun-2022, Manuscript No. AJPMPH-22-67919(R); Published: 09-Jun-2022

Description

Our immune system may become compromised by pancreatic cancer and its treatment, raising concerns that healthy people don't need to think about: Are immunizations safe for those who have pancreatic cancer? Are there any particular immunizations that cancer patients should receive? Is vaccination useful and safe for family members who provide care? According to BioNTech, half of the patients who received a novel tailored mRNA vaccination for pancreatic cancer were still clear of the disease 18 months after getting it.

Next-generation immunotherapy business Biopharmaceutical New Technologies (BioNTech) is a leader in developing cutting-edge treatments for cancer and other severe illnesses. For the quick development of novel biopharmaceuticals, the company makes use of a wide range of computational discovery and therapeutic drug platforms. Individualized and commercially available mRNA-based therapeutics, cutting-edge chimeric antigen receptor T cells, bispecific checkpoint immuno-modulators, specifically targeted cancer antibodies, and small compounds are all part of its diverse portfolio of oncology product prospects.

In addition to its extensive cancer pipeline, BioNTech and its partners are developing a number of mRNA vaccine candidates for a variety of infectious illnesses based on their substantial knowledge in the development of mRNA vaccines and internal manufacturing capabilities. With several international pharmaceutical partners, such as Genmab, Sanofi, Genentech, a member of the Roche Group, Regeneron, Genevant, Fosun Pharma, and Pfizer, BioNTech has developed a wide range of collaborations.

The first phase clinical trial included 16 patients with Pancreatic Ductal Adenocarcinoma (PDAC), a prevalent type of pancreatic cancer. They received a customised vaccination in eight doses that was created using genetic material extracted from their tumours.

The patients also had chemotherapy, had their tumours removed, and took atezolizumab. The medication prevents some cancer cells from signaling the immune system to refrain from attacking them. Eight individuals' cancer did not recur 18 months after getting the vaccination.

The genetic code is sent to the patient's cells through mRNA technology, which then tells them to manufacture proteins that are exactly like those produced by cancer cells. By producing these proteins, the immune system is strengthened to attack malignancies. The "Pfizer" COVID-19 vaccine, which was also created in 2020 by the German business BioNTech, uses the same technology. Chemotherapy is a common cancer treatment, but it also harms healthy, regularly dividing cells in addition to the tumour cells.

90 percent of patients with pancreatic cancer pass away within two years after diagnosis, with 28,000 to 30,300 new cases being diagnosed in the US each year. Due to the late onset of clinical signs, 80% of pancreatic tumours are metastatic when they are discovered.

"PDAC is one of the tumours with the highest unmet medical need since less than 5% of patients react to available treatments. We are determined to meet this challenge by utilising our extensive expertise in cancer vaccination research, and we're working to make strides in the treatment of these challenging malignancies "Dr. Prof. Zlem Türeci, co-founder

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and chief medical officer of BioNTech, stated.

The use of mRNA technology in the battle against cancer, especially metastatic melanoma, has previously been investigated by researchers. Cancer vaccines, in contrast to those for infectious diseases, are more concerned with treating the illness than with preventing it. There is no authorised cancer vaccine as of now.

Injecting messenger RNA (mRNA) encoding for tumor-associated antigens in mice can trigger anticancer immune responses, making this immunotherapy strategy widely applicable. In 21 patients with metastatic melanoma, we administered intradermally protamine-stabilized mRNAs encoding for Melan-A, Tyrosinase, gp100, Mage-A1, Mage-A3, and Survivin. In 10 cases, the immunisation also included Keyhole Limpet Hemocyanin (KLH). As an adjuvant, granulocyte macrophage colony-stimulating factor was used. Toxicity and immunological reactions served as endpoints. No adverse events of grade II or higher have been recorded.

Individuals receiving KLH saw a substantial reduction in the frequency of Foxp3+/CD4+ regulatory T cells throughout therapy, whereas patients receiving placebo experienced a reduction in myeloid suppressor cells (CD11b+HLA-DR lo monocytes). In 2 of the 4 immunologically evaluable patients, there was a measurable rise in vaccine-directed T cells. One of the seven patients with detectable illness had a full recovery. In conclusion, we have demonstrated the viability and safety of direct injection of protamine-protected mRNA. Further clinical research into the protamine-mRNA vaccine is encouraged by the therapy's strong impact on the frequency of immunosuppressive cells, the rise in vaccine-directed T cells after treatment in a subset of patients, and the development of a full clinical response.