STATINS IN DYSLIPIDEMIA CORRECTION

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Introduction. High cholesterol level can lead to many health problems including coronary heart disease, stroke, hypertension, endothelial dysfunction, diabetes mellitus type 2 complications. Discovering of statins revolutionized the treatment of hypercholesterolemia.

Aim. The aim of our study was to summarize modern knowledge of lipid-lowering medications "Statins", in particular, their mechanism of action, side effects and application for patients with COVID 19.

Matherials and methods. We analyze 97 scientific articles using electron database PubMed for medicine and archives of the Journal "Atherosclerosis" with key words "statins history of development", "statins mechanisms of action", "statins Covid 19" for the last 10 years (2001-2021).

Results and discussion. Statins are inhibitors of 3-hydroxy-3metylglutaryl-coenzyme A (HMG-CoA) reductase. Reaction catalyzed by this enzyme is the major point of cholesterol synthesis regulation. Cholesterol biosynthetic pathway was finally completed by 1960 and from that point searching for HMG-CoA reductase inhibitors began. To the end 1970th was discovered lovastatin and in 1982 it became the first commercial statin. In treating patients it dramatically decreased cholesterol level. Since that time in vivo and in vitro experiments as well as in clinical studies and patients` monitoring, HMG-CoA reductase inhibitors have been clearly proved to be highly efficacious at reducing blood levels of LDL cholesterol. They could decrease cardiac mortality and improved diabetic dyslipidemia.

Therefore, available evidence suggests some disorders under stain therapy. Nearly all of HMG-CoA reductase inhibitors are associated with musculoskeletal side effects. Myalgia is the most common consequence from statin use. Also were reported hepatic and renal dysfunction, peripheral neuropathy, malignancy, etc. However, these medications appear to be safe for the majority of patients.

The COVID 19 pandemic caused by SARS-Co-2 raised a lot of different questions, in particular, how to combine different medications therapy. While some physicians suggested that use of statins associated reduced risk of mortality in patients with SARS as agents against potential coronary endothelial dysfunction, others find no significant reduction.

Conclusions. Currently, according to the statistic more than 30 million of patients are taking statins because they are highly effective as cholesterol-lowering agents.

COMPARATIVE CHARACTERISTICS OF APPROACHES FOR DESIGNING A VACCINE AGAINST SARS-COV-2

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Introduction. Coronavirus Disease 2019 (COVID-19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), a newly emerged coronavirus, and has been pandemic since March 2020 and led to many fatalities. Vaccines represent the most efficient means to control and stop the pandemic of COVID-19.

Aim. The purpose of this review is to provide an overview of the advantages and disadvantages of different approaches to developing vaccines against coronavirus.

Materials and methods. Data analysis of literature and Internet sources.

Results and discussion. Various platforms for vaccine development are available namely: virus vectored vaccines, protein subunit vaccines, genetic vaccines, and monoclonal antibodies for passive immunization which are under evaluations for SARS-CoV-2, with each having discrete benefits and hindrances.

RNA vaccines introduce an mRNA sequence coded for a disease-specific antigen. Once this antigen is reproduced within the body, it is recognized and triggers an immune response. The translation of mRNA occurs in the cytosol of the host cell averting the risk of any sort of integration into the host genome. Safety issues with reactogenicity have been reported for various RNA based vaccines. It also shows instability.

DNA-based vaccines work by inserting synthetic DNA of viral gene(s) into small DNA molecules (called plasmids). Cells take in the DNA plasmids and follow their instructions to build viral proteins, which are recognized by the immune system, and prepare it to respond to disease exposure. The synthetic DNA is temperature stable and cold-chain free. It can be developed at an accelerated pace. It does not require the handling of the infectious viral particle. Though it elicits both Cytotoxic and humoral immunity, the titers remain low. Insertion of foreign DNA into the host genome may cause abnormalities in the cell. It may induce the antibody production against itself.

Viral vector vaccines insert a gene for a viral protein into another, harmless virus (replicating or non- replicating), which delivers the viral protein to the vaccine recipient, triggering an immune response. They show a highly specific gene delivery into the host cell with a vigorous immune response. It avoids handling of any infectious particle and it has been used widely for MERS-CoV with positive results from the trials. The host may possess immunity against the vector due to prior exposure, reducing the efficacy. It may lead to cancer due to the integration of the viral genome into the host genome

Subunit vaccines introduce a fragment of the virus into the body. This fragment is enough to be recognized by the immune response and stimulate immunity. They do not have any live component of the viral particle. Thus, it is safe with fewer side-effects. But it induces an immune response. Memory for future responses is doubtful.

Inactivated vaccines consist of the whole virus, which has been killed with heat or chemicals so it can't cause illness. Stable and safer as compared to the LAVs. It has the pre-existing technology and infrastructure required for its development. Has already been tested for SARS-CoV and various other diseases. It can be used along with adjuvants to increase their immunogenicity. Require the booster shots to maintain the immunity. Furthermore, large amounts of viruses need to be handled and the integrity of the immunogenic particles must be maintained.

Live attenuated vaccines are made up of whole viruses that have weakened in a lab. They tend to elicit a stronger immune response than inactivated vaccines. They have the intrinsic ability to stimulate the immune system by inducing the toll-like receptors (TLRs) namely: TLR 3, TLR 7/8, and TLR 9 of the innate immune system that involves B cells, CD4 and CD8 T cells. They can be derived from ‘cold adapted’ virus strains, reassortants, and reverse genetics. These vaccines requires an extensive accessory testing to establish safety and efficacy. There is a probability of nucleotide substitution during viral replication, resulting in the creation of recombinants post-vaccination.

Conclusions. While clinical treatment strategies have been optimized to save lives and improve prognosis, a safe and effective vaccine would have far-reaching public health significance for controlling and stopping the COVID-19 pandemic.