عنوان مقاله:

Original Research Nano-adjuvanted polio vaccine: Preparation and characterization of chitosan and trimethylchitosan (TMC) nanoparticles loaded with inactivated polio virus and coated with sodium alginate

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خلاصه مقاله:

Objective(s): It is proposed that particulate antigens could better interact with the antigen presenting cells (APCs). A fast, simple and scalable process for preparation of polymeric nanoparticles (NPs) is coating of charged antigenic particles, like viruses, with oppositely charged polymers. A second coating with a charged polymer could increase the stability and modify the immunomodulatory potentials of NPs. Materials and Methods: Negatively charged inactivated polio virus (IPV) was coated with cationic polymers, chitosan (CHT) and trimethylchitosan (TMC) by a simple incubation method. CHT: IPV and TMC: IPV NPs were coated by anionic polymer, sodium alginate (ALG). Physical characteristics and stability of NPs were studied. Cytocompatibility of NPs was checked with MTT assay. DC maturation study was used for evaluation of the NPs potential in interaction with DCs. Results: Among the various polymer to antigen ratios tested, the least size and PDI and the highest ZP was seen in TMC: IPV (2:1), CHT: IPV (2:1), ALG: TMC: IPV (2:2:1) and ALG: CHT: IPV (4:2:1). The physical stability of TMC: IPV and CHT: IPV was preserved until 15 days. After an early de-association of some part of coated alginate, ALG: CHT: IPV and ALG: TMC: IPC NPs were stable until the end of study (25th day). No one of the NPs formulations had a negative effect on cell viability. Compared with plain IPV, nanoparticulate IPV formulations failed to increase the expression of CD40 and CD86 markers of DCs. Conclusion: NPs prepared with simple and scalable method, had reasonable physical characteristics, stability and cytocompatibility and could be tested in vivo for their immunoadjuvant potential.

کلمات کلیدی:

(Alginate, Chitosan, Inactivated Polio Virus, Nanoparticles, Trimethylchitosan (TMC

لینک ثابت مقاله در پایگاه سیویلیکا: