Abstract

Gallic acid is a strong chelating agent. Due to the accumulation of the drug in the body tissues, it causes toxicity and side effects. According to previous studies, Preparation of nano formulation causes a change in the pharmacokinetics of drugs. Therefore, it is expected that by nanoforming gallic acid, its toxicity in the body will be reduced and it will act more selectively (increasing the selectivity towards cancer cells and increasing the antioxidant property) so that its side effects will decrease. The purpose of the study was to prepare chitosan nanoparticles containing gallic acid drug and to determine the size and surface charge of nanoparticles, morphology by SEM method, to determine the amount of drug loaded in prepared nanoparticles and to determine the release pattern of gallic acid drug.

Method

Chitosan nanoparticles were prepared by ionic gelation method. The produced nanoparticles were analyzed by DLS technology and zeta potential (ZP) and scanning electron microscope (SEM). The release of gallic acid drug was carried out in buffer medium containing PBS.

Results

The size of chitosan nanoparticles was 293.6 nm with a PI of 0.21 and a zeta potential of +8.40. The release pattern of the drug is first explosive and then slow release. The amount of drug loaded in chitosan nanoparticles was calculated to be 97/16%. The obtained nanoparticles release 80.3% of gallic acid within 10 hours.

Discussion

Chitosan nanoparticles containing gallic acid were successfully produced. After preparation, chitosan nanoparticles were evaluated in terms of physicochemical properties such as particle size, zeta potential, drug loading percentage, release pattern and morphological properties. According to similar studies, its effectiveness is expected to increase by changing the pharmacokinetic factors of the drug. Therefore, to further investigate this study, more animal experiments will be performed.

Keywords: Gallic acid, Nanoparticle, ionotropic Gelatin Method، chitosan.