STUDY OF SOLID LIPID NANOPARTICLE ENCAPSULATING SYRINGOPICROSIDE FOR LIVER TARGETING

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1.Object:We will be developed into Syringopicroside liver targeting of solid lipid nanoparticles preparation[1-2], to construct a suitable hydrophilic iridoid glycosides in the delivery of drug hepatic release system for Syringopicroside Provide scientific basis for clinical application.

2.Research Methods

2.1.Physical and Chemical Properties and Pharmacodynamic Study about Syringopicroside

The combination of resin and gas chromatography methods, prepared Syringopicroside API, Methanol - water (50:50 v / v) as mobile phase, HPLC method for the determination of the Syringopicroside API in the HPLC, the normalization method, the purity of up to 95%. In preformulation studies, determination of the dissociation degree about Syringopicroside , Syringopicroside showed pka is 9.63 ± 0.14. Determination of Syringopicroside octanol / phosphate buffer partition coefficient showed lgPapp 0.082.

2.2.S-SLN Preparation and Characterization

We had applied a solvent emulsification evaporation method to prepare S-SLN.Through orthogonal experimental design, one optimum recipes of S-SLN was founded,that is, lecithin/glycerol monostearate 3:1,organic phase/water phase 1:2,F68% 0.4%, syringopicroside 10mg. The S-SLN suspension prepared by the optimal formulation was spheroidal shape through observing by transmission electron microscopy.Its encapsulation efficiency was 42.35%,drug-loaded capacity was 5.33%,the mean particle diameter was 180.3nm,the zeta potential was -41.9mv .

2.3. Preparation of S-SLN freeze-dried powder To further enhance the S-SLN stability, S-SLN purified, freeze-dried with different types of protective agents, freeze-dried powder preparation of freeze-drying to the appearance, particle morphology, particle size and encapsulation rate as an indicator to evaluate the different ccessories for S-SLN molding process of freeze-dried powder..An investigation on in vitro drug release was carried on,from the resuls we obserbed freeze-dried SLN followed by a prolonged release tally with Higuchi equation.

2.4. Pharmacokinetics of S-SLN in rats Syringopicroside as the control of S-SLN pharmacokinetic parameters, the time point in the design of orbital blood in rats, using RP-HPLC Syringopicroside in the whole blood drug concentration in pharmacokinetic parameters with 3P97 software for processing, fitting the pharmacokinetic parameters.

2.5. Study on distribution of rat's body after intravenous injection S-SLN. After intravenous injection S-SLN solution and syringopicroside solution tissues concentrations of syringopicroside were determined using HPLC method. syringopicroside accumulations in different tissues were calculated by trapezoidal rule,and then evaluated the distribution of syringopicroside in mice organs with drug targeting index and selective index. The HPLC method of parent compound syringopicroside in mice was established and the syringopicroside conenetartion in the plasma and tissues of the mice was determined.The amount of durg distribution in plasma and tisuses was examined after intravenous administration of S-SLN and syringopicroside solution.

2.6. Study on the role of Syringopicroside and SYR-SLN about DHBV Model Zhejiang brown spot ducklings with congenitally infection of DHBV detected by PCR were divided into eight groups randomly, which were blank control group, high dose group, high dose group, medium dose group and low dose group of syringopicroside ,medium dose group and low dose group of solid lipid nanoparticles loaded with syringopicroside, as well as lamivudine group. They were treated with different dose of SYR-SLN and lamivudine respectively. At the day before the treatment, the 5th, 10th, 15th days in the treatment and 5th day after the suspend of it, the contents of serum DHBV DNA were determined respectively by the means of quantitative real-time PCR. Serum levels of ALT, AST and liver biopsy was also done before and after the treatment with HE staining to detect the transformation of inflammation.

3.Conclusions and results: S-SLN particle size, morphology, encapsulation efficiency and loading volume requirements to agents, freeze-dried powder rehydration better. S-SLN have some controlled release, can effectively extend the half-life of syringopicroside,S-SLN can improve the targeting of syringopicroside,increased bioavailability.S-SLN after injection can effectively inhibit the replication of DHBV and reduce the serum transaminase levels, reduce liver inflammation and fibrosis. This study not only for anti-HBV drug development to innovation and scientific information provided, but also water-soluble drugs for the study of nano technology to provide references.

References

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