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Pharmacological evaluation of hepatoprotective activity by quercetin, rutin, silibinin nanoformulation

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Medicinal plants are significant sources of hepatoprotective drugs and more widely used than allopathic drugs as hepatoprotective because these are usually inexpensive, better cultural acceptability, improved compatibility with the human body and minimal side effects. One of the important applications of nanoparticles in medicine includes effective drug delivery system. To evaluate the hepatoprotective activity of prepared Plain (P NPs), Quercetin (Qu NPs), Rutin (Ru NPs), Silibinin (Si NPs), Quercetin-Rutin (Qu-Ru NPs) and Quercetin-Silibinin (Qu-Si NPs) polymeric nanoparticles in comparison with pure corresponding phytochemicals using paracetamol, CCl4 and ethanol induced animal model. Prepared dual loaded Quercetin-Rutin (Qu-Ru NPs), Quercetin-Silibinin (Qu-Si NPs) polymeric nanoformulation displayed enhanced hepato protective activity against Ethanol intoxicated in comparison with pure compound and single loaded polymeric nanoformulation.

Introduction: The one of the important clinical application of flavonoids like Silibinin, quercetin and rutin are widely used as a hepatoprotective, anti-inflammatory and antifibrotics agent.Nanotechnology is the manipulation of matter on atomic, molecular and supra molecular scale. National Nanotechnology Initiative defined nanotechnology as manipulation of matter with at least one dimension sized from 1 to 100 nanometers.Hence the aim of the study is to prepare single loaded flavono polymeric nanoparticles and compare its hepatoprotective efficacy with pure drug.

Experimental Methods: Hepatoprotective effect of prepared Quercetin (Qu NPs), Rutin (Ru NPs), Silibinin (Si NPs), Quercetin-Rutin (Qu-Ru NPs), Quercetin-Silibinin (Qu-Si NPs) loaded polymeric nanoparticles was assessed in comparison with pure, control and positive control. After the treatment period, Hepatoprotective effect was evaluated using liver biomarkers (SGOT, SGPT, ALP, Total protein & Total Bilirubin).

Results and Discussion

- The elevation of the SGOT, SGPT, ALP and Total bilirubin in Ethanol induced rat was higher than normal control.
- Ethanol induced animals treated with prepared dual loaded Quercetin-Rutin (Qu-Ru NPs), Quercetin-Silibinin (Qu-Si NPs) polymeric nanoformulation, the level of SGOT, SGPT, ALP and Total bilirubin remarkably decreased where as increased total protein in comparison with single loaded (Qu NPs), (Ru NPs) (Si NPs) polymeric nanoformulation and positive control group.
- On the other hand, among these five prepared nanoformulation, the dual loaded polymeric nanoformulation (DLNFs) showed significantly better hepato protective activity.

Conclusion: Hepatoprotective activities were performed to evaluate the efficacy of prepared Quercetin (Qu NPs), Rutin (Ru NPs), Silibinin(Si NPs), Quercetin-Rutin(Qu-Ru NPs), Quercetin-Silibinin(Qu-Si NPs) loaded polymeric nanoparticles. Prepared dual loaded Quercetin-Rutin(Qu-RuNPs),Quercetin-Silibinin(Qu-SiNPs) polymeric nanoformulation displayed enhanced hepato protective activity against the toxic agent Ethanol intoxicated in comparison with pure compound and single loaded polymeric nanoformulation. However, out of five prepared nanoformulation, dual loaded polymeric nanoformulation (DLNPs) showed significantly improved hepato protective activity.

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