[S2-5] [10/10/2003(Fri) 13:30-14:00/ Grand Ballroom 103]

Formulation and Biopharmaceutical Evaluation of Self-Microemulsifying Drug Delivery Systems (SMEDDS) Containing Silymarin

Tae Seo Kim

Research Institute, Hanmi Pharmaceutical Corporation

Carduus marianus extract (formally called silymarin) have been used mainly as a medicament for hepatobiliary diseases. The major component of silymarin is silybin, which constitutes between 50 and 70% of the drug and is the major active component. Many experiments show the efficacy of silybin parenterally administerated. But, its bioavailability is low after oral administration due to its low solubility in water. In order to improve its dissolution rate, silymarin was formulated in the form of self-microemulsifying drug delivery system (SMEDDS) which consists of GMO as a oil phase, Tween 20 containing 50% HCO-50as surfactant (S) and Transcutol as cosurfactant (CoS). Using the SMEDDS formulation of 10% oil phase in combination with the S/CoS mixing ratio of 1, the microemulsion existence range was found to be wider compared with the other SMEDDS formulation. The dissolution rate for silybin from SMEDDS was significantly higher than from conventional solid dosage form, irrespective of the pH of dissolution medium. Following oral administration in rats, SMEDDS provided also significant increase in the bioavailability compared with conventional solid dosage form. Therefore, it may be concluded that a significant improvements in dissolution rate and bioavailability of silymarin are achieved with SMEDDS, and this developed SMEDDS formulation can be used as a possible alternative to conventional oral dosage form of silymarin to improve its bioavailability.

Fig. Phase diagram of SMEDDS containing silymarin with S/CoS mixing ratio of 1.

Fig. The plasma concentration-time profiles of silybin after oral administration of silymarin SMEDDS and conventional dosage form (L capsule) to rats at the dose of 30mg/kg as silybin. Data are expressed as the mean ± SE (n=7).

Key; ○: SMEDDS, ●: Reference capsule.