

## Development of new oral self-microemulsifying drug delivery systems (SMEDDS) for carvedilol

G. Yousefi, S. Daneshamoz, F. Sadoughian \*

*Department of pharmaceuticals, Faculty of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran*

**Background and Aims:** In this study a series of new self-microemulsifying drug delivery systems (SMEDDS) were developed to increase the solubility and dissolution rate of a poorly water soluble drug, Carvedilol. It is supposed that optimum formulations can increase the oral bioavailability of drug efficiently.

**Methods:** Pseudoternary phase diagrams of oil (Oleic acid, Olive oil, Sesame oil, Trioleate, Fish oil, Almond oil, Caster oil,...), surfactant (Tween20, Tween80, Tween60, Span80), co-surfactant (PEG400, PG, Ethanol, IPA) and water were developed using water titration method. SMEDDS formulatins were evaluated for microemulsifying properties including clarity, dilutability, and particle size. Finally the optimum systems were selected for loading of carvedilol and their dissolution rates were investigated using basket dissolution apparatus and compared to Cryol® carvedilol tablet.

**Results:** The selected SMEDD systems showed optimum size (less than 100nm) and were visually transparent. Moreover, they were able to load carvedilol efficiently and their dissolution rate of drug were significantly faster than marketed brand tablet.

**Conclusions:** Our study confirmed that carvedilol SMEDD formulations offer more predictable and extensive drug release than the corresponding conventional tablet formulation.

**Keywords:** Carvedilol; SMEDDS; Psudoternary phase diagrams; Dissolution rate; Water titration