

## Preparation and characterization of biodegradable meloxicam gelatin microspheres for intra-articular administration

M. Farhangi\*, S. Dadashzadeh, N. Bolourchian,

*Department of Pharmaceutical Sciences, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran.*

**Background and Aims:** A controlled release delivery system that localizes meloxicam in synovial joint is preferred to treat inflammation in rheumatoid arthritis. Therefore, the purpose of this study was to develop and characterize meloxicam- loaded gelatin microspheres. The ability of native and oxidized sucrose to induce the cross-linking of gelatin was also studied.

**Methods:** Meloxicam gelatin microspheres were prepared by emulsion-congealing method and were characterized in terms of the percentage of encapsulation efficiency (%EE), particle size and release profile. The effect of different amounts of polymer, emulsifier, cross-linking agents (native and oxidized sucrose) and time of cross-linking on %EE and release profile was evaluated.

**Results:** The mean particle size of meloxicam-loaded gelatin microspheres for the selected formulation was around 100 $\mu$ m and the %EE was %55. Increasing the time of cross-linking from 5 to 10 min did not have any significant effect on %EE. Increasing the concentration of polymer from 25 to 35% (w/v) had a marked effect on %EE. The release of meloxicam was sufficiently retarded by the prepared microspheres.

**Conclusions:** The results demonstrated that sucrose could be used as a suitable and safe cross-linking agent for preparation of meloxicam loaded gelatin microspheres. The prepared biodegradable microspheres had appropriate physicochemical characteristics for intra-articular administration and may deserve further evaluations.

**Keywords:** Meloxicam; Gelatin microspheres; Sugar