INVITED EDITORIAL

Fast dissolving meloxicam formulation for acute dental pain: Thoughts to ponder

In the April-June issue of Asian Journal of Pharmaceutics 2008, Inamdar *et al.* have reported the development of a new formulation of meloxicam based on solid dispersion technique using a number of polymers.[1] This eloquently performed work demonstrated that via the incorporation of optimized solid dispersion attributes into fast disintegrating tablets it is possible to further enhance the dissolution profile of meloxciam such that within 1 min almost 95% of the drug release occurred under ideal conditions of dissolution.[1]

Unquestionably in the pain world, perhaps, one would not the question the relevance of such a fast disintegrating and dissolving tablet formulation of meloxicam.[1] This report of Inamdar *et al.* attains greater significance given the recent biopharmaceutical findings that explain the poor performance of the regular oral tablet formulations of ibuprofen and meloxicam in the treatment of acute dental pain.[2,3] Jamali and co-workers have showed that the pathophysiology of acute dental pain which caused vagus nerve suppression and significantly retarded the *in vivo* performance of the regular immediate release formulations of both ibuprofen and meloxicam.[2,3] As a result, the regular oral formulations of ibuprofen or meloxicam showed not only delayed attainment of peak concentrations but also manifested subdued plasma levels and reduced total exposure.[2,3] Obviously, although such formulations are quite adequate under normal conditions of physiology, would result in treatment failures in patients suffering from acute dental pain due to the altered physiology of the gastrointestinal tract related to the pain and trauma.

It was contemplated that the best way to overcome the pathophysiology due to vagus nerve suppression in dental pain was to formulate the drug substance such that it can overcome the gastrointestinal related issues that would affect the *in vivo* performance of the formulation.[3] Accordingly, the fast dissolving oral meloxicam formulation was designed and compared with the regular meloxicam tablets in a preclinical model.[3] The use of intraperitoneal propanthyline, 1 h prior to meloxicam dosing, served the need of complete vagal nerve suppression in the rats.[3] The pharmacokinetic data suggested that while the regular meloxicam formulation was affected by vagal suppression (delayed peak time and almost 3-fold lower exposure as compared to control rats - 64 µg.h/mL versus 22 µg.h/mL), the newly designed fast dissolving meloxicam formulation overcame the vagal suppression without any alteration in the pharmacokinetic parameters (i.e., AUC values were 64 µg.h/mL in control rats versus 65 µg.h/mL in vagal suppressed rats).[3] Hence, this study unequivocally confirmed that the formulation manipulations in terms of disintegration and dissolution attributes could be optimized to overcome the significant effect of vagal suppression on the absorption rate of oral compounds.[3]

While the rationale for fast dispersion tablet of meloxicam by Inamdar *et al.*[1] appeared to be primarily motivated by some issues such as poor water solubility, rapid saturation of the first dissolved portion which leads to precipitation of the remaining drug in a colloidal form etc, there may be an opportunity to test this fast dispersion tablet of meloxicam in acute pain models to confirm its real utility.

In summary, intelligent and innovative formulation development work is needed to overcome some of the biopharmaceutical issues related to vagal suppression observed in patients with dental pain. The work of Inamdar *et al*. suggested that the present day technology offers formulators various options in the design of superior oral formulations to overcome the severe impediments posed by vagal suppression.[1] Additionally, such novel formulation strategies may also find utility in other acute pain conditions most notably migraine attacks.

REFERENCES

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