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Impact of Ethyl Cellulose Ether Derivative (Ethocel) on the *In Vitro* and *In Vivo* Release of Nimesulide from Matrix Tablets

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***SUMMARY*. This research was carried out to investigate the effect of an ethyl cellulose ether derivative (Ethocel®) on the release of nimesulide from matrix tablets prepared by direct compression. Simultaneously it was evaluated the in *vitro-in vivo* relationships from the prepared tablets. Several parameters were studied including the effect of particle size of the polymer, drug to polymer ratio, *in vitro* release behaviour and the in vivo release profile. Different batches of nimesulide were prepared with Ethocel® 7 Premium and Ethocel® 7 Fine Particle Premium (7FP) with different drug to polymer ratios for each polymer by direct compression. *In vitro* release was studied using the USP method I (rotating basket method) in phosphate buffer (pH 7.4) at 37 °C ± 0.5 °C using a rotational speed of 100 rpm. Samples were analyzed at predetermined time intervals by UV visible spectrophotometer. *In vivo* studies were carried out in rabbits. Analysis of plasma samples was conducted by HPLC. The *in vitro* dissolution studies showed that the particle size and the drug to polymer ratio markedly influenced the release profile. Different kinetic models were applied to the release data for each formulation. All the formulations followed non-Fickian anomalous release. A good level A *in vitro-in vivo* correlation was achieved with a coefficient of determination (r^2) equal to 0.9418. The study showed that Ethocel® 7P and 7FP can successfully be used as a rate controlling agent for nimesulide controlled release matrix tablets.**

KEY WORDS: Controlled drug delivery, Drug to polymer ratio, Ethocel® 7Premium and Ethocel® 7 Fine Particle Premium (7FP), Release mechanism, Kinetic models.

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