IN VITRO-IN VIVO CORRELATION OF THE PHARMACOKINETICS OF VINPOCETINE

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Vinpocetine is extensively metabolized in rats, dogs and humans, and the plasma clearance approximates the hepatic plasma flow in each of the species. In vitro degradation studies with hepatocytes have shown that the activity of human hepatocytes is about one order of magnitude higher than the activity of dog hepatocytes, and two orders of magnitude higher than that of rat hepatocytes. These differences can explain the differences in bioavailabilities of vinpocetine in the three species (52% in rats, 21.5 ± 19.3% in dogs and 6.2 ± 1.9% in humans). In dogs and humans, the compound seems to be metabolized exclusively in the liver whereas in rats extrahepatic metabolism seems also to be important. The in vivo clearance predicted from the activity of hepatocytes is in good agreement with the values measured in vivo in the case of humans and dogs. The estimated values for bioavailability showed good correlation with in vivo data in each species if the free drug ratio was assumed to equal 1.

Key words: vinpocetine, pharmacokinetics, rat, dog, human, hepatocytes, bioavailability

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