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Pharmacokinetics of cannabidiol in dogs.

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Abstract

Cannabidiol (CBD) is one of the major nonpsychoactive cannabinoids produced by Cannabis sativa L. Recent studies have shown that CBD has a high protective index, comparable to that of phenobarbital and phenytoin. Because CBD has been reported to possess both anticonvulsant and antiepileptic activity, its pharmacokinetics were studied in dogs after the administration of two iv doses (45 and 90 mg) and one oral dose (180 mg) to dogs. After iv administration, CBD was rapidly distributed, followed by a prolonged elimination. It has a terminal half-life of 9 hr. CBD plasma levels declined in a triphasic fashion. The total body clearance of CBD was 17 liters/hr (after the 45-mg dose) and 16 liters/hr (after the 90-mg dose). This clearance value, after its normalization to blood clearance using mathematical equations, approaches the value of the hepatic blood flow; the extraction ratio in the liver is 0.74. CBD was observed to have a large volume of distribution, approximately 100 liters. In the dose range of 45 to 90 mg, the increase in the AUC was proportional to the dose, a fact that indicates that the pharmacokinetic profile of CBD in this dose range was not dose dependent. In three of the six dogs studied, CBD could not be detected in the plasma after oral administration. In the other three, the oral bioavailability ranged from 13 to 19%. The results of this study show that CBD is barely absorbed after oral administration to dogs. This low bioavailability may be due to a first pass effect.