

Pentoxifylline

Pentoxifylline is a synthetic dimethylxanthine derivative that is structurally related to theophylline and caffeine. Unlike these agents, pentoxifylline has hematological effects that are useful in the symptomatic treatment of complications of peripheral vascular diseases. Pentoxifylline also has been used to manage acute and chronic cerebrovascular insufficiency, sickle cell disease[220] and painful diabetic neuropathy.

It was approved by the FDA in August 1984.

Mechanism of Action

The actions of pentoxifylline include increased erythrocyte flexibility and decreased blood viscosity. The mechanism of action for increasing erythrocyte flexibility is unknown, but the drug's actions appear to be related to inhibition of erythrocyte phosphodiesterase, which causes an increase in erythrocyte cAMP activity. This increase allows the erythrocyte membrane to maintain its integrity and become more resistant to deformity. Pentoxifylline's effect on blood viscosity is attributed to its reduction in plasma fibrinogen concentrations and an increase in fibrinolytic activity, as well as to its effects on erythrocytes. Improvement in blood viscosity results in increased blood flow to the microcirculation and enhanced tissue oxygenation. Unlike theophylline, pentoxifylline does not possess any bronchodilatory actions. Although pentoxifylline does not possess any direct anti-sickling properties, its actions on erythrocyte flexibility make it potentially beneficial in sickle cell disease.

Pharmacokinetics:

Absorption of pentoxifylline from the gastrointestinal tract following oral administration is rapid and almost complete. There is significant first-pass effect after absorption. Peak plasma levels are attained within 2-4 hours. The rate but not the extent of absorption is affected by co-administration with food. The distribution of Pentoxifylline has not been fully characterized, but it is known that the drug and its metabolites are distributed into breast milk (see Contraindications/Precautions).

Metabolism of pentoxifylline occurs in both the erythrocytes and the liver. All metabolites contribute to the hematological effects of Pentoxifylline. The 5-hydroxyhexyl metabolite is equivalent to pentoxifylline in its pharmacologic effects. Once absorbed, pentoxifylline is metabolized rapidly by the erythrocytes to its 5-hydroxyhexyl metabolite and by the liver to its 3-carboxypropyl metabolite. The plasma half-lives of pentoxifylline and its metabolites are 0.4—0.8 hours and 1.6—1.8 hours, respectively. The elimination half-lives of pentoxifylline and its 5-hydroxyhexyl metabolite increase with increasing doses of the drug, but the elimination half-life of the 3-carboxypropyl metabolite does not. Excretion of pentoxifylline and its metabolites is primarily renal. The manufacturer states that the drug does not accumulate in plasma with multiple oral doses in patients with normal renal function. Although excretion is reduced in patients with renal impairment, dosage adjustment usually is not required.

Packaging

20mg/ml - 2ml, Box of 10 vials