Abstract

Eur J Pharmacol. 2010 Jun 10;635(1-3):117-23.

Anti-fatigue effect of dicethiamine hydrochloride is likely associated with excellent absorbability and high transformability in tissues as a Vitamin B(1).

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OBJECTIVE: The anti-fatigue effect of dicethiamine hydrochloride (DCET) was assessed and compared to that of thiamine hydrochloride (VB(1)HCl) in rats. The absorbability and tissue distribution of thiamine after oral administration of DCET and VB(1)HCl were also examined.

METHODS: To create fatigued animals, male SD rats were placed in plastic cages containing 1.5cm of water for 5 consecutive days. The extent of fatigue was evaluated by a weight-loaded forced swimming test. After oral administration of DCET or VB(1)HCl to non-fatigued rats, blood and tissues were serially collected to determine the concentrations of thiamine and its phosphate esters. Pharmacokinetic analysis was performed to examine the thiamine profile in the body after administration of DCET or VB(1)HCl.

RESULTS: Swimming time was significantly shorter for the fatigued vehicle group than the non-fatigued group. DCET (30 and 100mg/kg) significantly prolonged the swimming time compared to the fatigued vehicle group. The anti-fatigue effect of VB(1)HCl (70.1mg/kg) was not significant in our set of results. Both DCET and VB(1)HCl were rapidly absorbed into the circulating blood as thiamine and eventually became localized in the organs. Thiamine was distributed at higher concentrations to the blood, heart, thigh muscles, cerebellum, hippocampus, and thalamus after administration of DCET compared to VB(1)HCl.

CONCLUSIONS: These results indicate that DCET is a vitamin B(1) derivative that has excellent absorbability and transformability in tissues and suggest that DCET as an oral therapy may be useful against combined mental and physical fatigue, such as that often encountered in contemporary society.

PMID: 20307527