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## Ascorbic acid (vitamin C) effects on withdrawal syndrome of heroin abusers.

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### Abstract

**BACKGROUND:** Ascorbic acid (vitamin C), administered orally in high doses has been observed to relieve pain and reduce opioid use in cancer patients. In vitro studies have also shown that antioxidants, such as **vitamin C**, may, at high concentrations, inhibit the endogenous opioid degrading metalloenzyme and increase endorphin levels. In the present study the effects of oral administration of high doses of **vitamin C** on withdrawal syndrome of heroin abusers were investigated.

**MATERIALS AND PATIENTS:** Ascorbic acid at doses of 300 mg/kg b.w/day, supplemented with vitamin E (5 mg/kg b.w/day), was orally administered in two groups of heroin addict subjects consisting of in-patients (Group A, 30 males) and one of out-patients (Group B, 10 males), for a minimum of 4 weeks. The group A in-patients were also administered the conventional (diazepam + analgesic) medication. The results on the intensity of withdrawal syndrome (WS), estimated according to DMS-III criteria, were compared to a third group of heroin addict in-patients (group C, 30 males-control group), treated only by conventional medication.

**RESULTS:** The patients of the **vitamin C**-treated groups (in-patients and out-patients) experienced mild WS (in 46.6% to 50% of the subjects) in contrast to the control group patients, who experienced mild WS in 6.6% of the cases. The **vitamin C**-treated subjects expressed major WS ranging from 10% to 16.6%, in contrast to the untreated subjects (control group), who expressed a major WS in 56.6% of the cases.

**CONCLUSIONS:** The results indicate that high doses of **ascorbic acid** administered orally, may ameliorate the withdrawal syndrome of heroin addicts. Further studies are needed in order to estimate the dose- and time-dependent effects of **ascorbic acid** treatment, and to clarify its mechanisms of action in the withdrawal syndrome.

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