AIMS: Vanadium is currently undergoing clinical trials as an oral drug in patients with noninsulin-dependent diabetes mellitus. Furthermore, vanadium occurs in elevated concentrations in the blood of patients receiving intravenous albumin solutions containing large amounts of the metal ion as an impurity. The present study was performed to examine the pharmacokinetics of vanadium in humans following a single intravenous (i.v.) dose of a commercial albumin solution containing a high amount of vanadium. METHODS: The study was conducted in five healthy volunteer subjects who received intravenously 90 ml of a commercial 20% albumin infusion solution containing 47.6 micro g vanadium as an impurity. Vanadium concentrations in serum and urine were determined by electrothermal atomic absorption spectrometry. RESULTS: Vanadium serum concentrations after i.v. administration were measured for 31 days. The data could be fitted by a triexponential function corresponding formally to a three-compartment model. There was an initial rapid decrease in serum concentrations with half-lives of 1.2 and 26 h. This was followed by a long-terminal half-life time of 10 days. The terminal phase accounted for about 80% of the total area under the serum concentration-time curve (AUC). The mean apparent volume of distribution of the central compartment was found to be 10 l. The volume of distribution at steady state was 54 l,
and total clearance was 0.15 l h\(^{-1}\). Vanadium was mainly excreted by the kidneys. About 52% of the dose was recovered in the urine after 12 days. CONCLUSIONS: This study provides data on vanadium pharmacokinetics in healthy humans.