Although the pharmacokinetics of dexmedetomidine have been studied in pediatric patients, there are no data for Chinese children available" Liu et al (2016).

Abstract:

BACKGROUND AND OBJECTIVE: Dexmedetomidine is a highly selective alpha2-adrenoceptor agonist with sedative and analgesic properties which is also used in pediatric anesthesia. Although the pharmacokinetics of dexmedetomidine have been studied in pediatric patients, there are no data for Chinese children available. As alterations in pharmacokinetics due to ethnicity cannot be ruled out, it was the aim of this study to characterize the pharmacokinetics of dexmedetomidine in Chinese pediatric patients.

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METHODS: Thirty-nine children aged 1-9 years undergoing surgery were enrolled in the study. Dexmedetomidine was administered as short intravenous infusion of 1-2 μg/kg in 10 min. Venous blood samples were drawn until 480 min after stopping of infusion. Dexmedetomidine plasma concentrations were measured with high-performance liquid chromatography and mass spectrometry. Pharmacokinetic modeling was performed by population analysis using linear compartment models.

RESULTS: Data of 36 patients (age 1-9 years, weight 10-27 kg) were analyzed. The pharmacokinetics of dexmedetomidine were best described by a two-compartment model with an allometric power model and estimates standardized to 70 kg body weight. The population estimates (95 % CI) per 70 kg bodyweight were: clearance 36.2 (33.3-41.1) l/h, central volume of distribution 84.3 (70.3-91.4) l, intercompartmental clearance 82.8 (63.6-136.6) l/h, peripheral volume of distribution 114 (95-149) l, and terminal half-life 4.4 (3.6-5.3) h. Age did not show any influence on weight-adjusted parameters.

CONCLUSIONS: Chinese children showed a similar clearance, but larger volumes of distribution and longer terminal half-life when compared to studies in Caucasians.

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Reference:

Liu, H.C., Lian, Q.Q., Wu, F.F., Wang, C.Y., Sun, W., Zheng, L.D., Schüttler, J. and Ihmsen, H. (2016) Population Pharmacokinetics of Dexmedetomidine After Short Intravenous Infusion in Chinese Children. European Journal of Drug Metabolism and Pharmacokinetics. April 1st. .

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