Pharmacokinetic Modeling of Ropivacaine Following Single Shot Erector Spinae Plane Block in Anesthetized Children

NCT: 04298099

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Statistical Analysis:

Prior investigations have suggested that a 1-compartment model with an absorption rate constant best describes the pharmacokinetic profile of Ropivacaine.[12,13] Therefore, population pharmacokinetic analysis was performed with NONMEM v.7.4[12,13] (Icon, PLC; Dublin, Ireland) and PDx-Pop 5.2 (Icon, PLC, Dublin, Ireland) using first-order conditional estimation with interaction (FOCE-I). One- and two-compartment models with an absorption rate constant (Ka^{-1}) and various error structures were evaluated, and the final model was selected based upon a significant reduction in the objective function value ($p<0.05$), in conjunction with standard subjective evaluation of graphical representations of model fit. Models were generated for both total and free Ropivacaine concentrations. After the final models were generated, simulation (n=1000) of serum concentrations (total and free Ropivacaine) was performed using 1, 1.5, 2, and 2.5 mg/kg/dose in a patient with a median weight value from the dataset.

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