INTRODUCTION: Sugammadex effectively and rapidly reverses deep to moderate rocuronium-induced neuromuscular block. However, the required dose of sugammadex for smaller degrees of residual block is unknown. Therefore we investigated the efficacy of sugammadex and neostigmine at a train-of-four (TOF) ratio of 0.5. METHODS: After ethics committee (Munich, Germany) approval and written informed consent were obtained, 99 patients were anesthetized with propofol, remifentanil, and rocuronium. Neuromuscular monitoring was performed by calibrated electromyography. At recovery of the TOF ratio to 0.5, patients randomly received sugammadex (0.0625, 0.125, 0.25, 0.5, or 1.0 mg/kg), neostigmine (5, 8, 15, 25, or 40 ?g/kg), or saline. The time between study drug injection, at TOF ratio of 0.5, and postoperative TOF ratio of 0.9 was measured. The dose-response relationship was analyzed with a biexponential model using the dose as the independent variable and the logarithm of the recovery time as the dependent variable. Effective doses were interpolated from regression models. RESULTS: Sugammadex, 0.22 mg/kg, is able to reverse a TOF ratio of 0.5 to 0.9 or higher in an average time of 2 min. Within 5 min, 95% of patients reach this TOF ratio. Neostigmine, 34 ?g/kg, is able to reverse a TOF ratio of 0.5 to 0.9 or higher within 5 min. No recurarization was observed. CONCLUSIONS: Sugammadex, 0.22
mg/kg, and neostigmine, 34 ?g/kg, effectively and comparably reverse a rocuronium-induced shallow residual neuromuscular block at a TOF ratio of 0.5.