Numerous medications have been investigated as adjuncts to local anesthetics (LA) for use in intravenous regional anesthesia (IVRA) for upper extremity surgery. While several authors have assessed the use of tramadol in IVRA, conclusions have been disparate. These studies suffer due to small sample sizes and a lack of statistical power. The goal of this study was to review the available literature and use meta-analysis to assess the utility of tramadol use in IVRA.

Materials and Methods

A literature search was conducted on the use of tramadol in IVRA for upper extremity surgery using PubMed, Ovid and Cochrane databases, including the reference sections of relevant articles. Inclusion criteria stipulated that only prospective/randomized trials of adult patients undergoing IVRA be included, that studies directly compare the use of LA alone to LA plus tramadol (LA+T), and that outcome data be presented in a format suitable for comparative analysis. Outcomes of interest included onset, duration and recovery of sensory and motor block, duration of analgesia, intra-operative and post-operative analgesic requirements, pain levels and adverse event rates. Random-effects meta-analysis was used to compute effect sizes and compare LA+T vs. LA groups. Results were considered statistically significant if P<0.05.

Results

Six studies (246 patients) met criteria for inclusion. No significant difference in surgical site or tourniquet-related pain scores (measured by 10 point visual analogue scale) was detected intra-operatively or post-operatively, with the exception of pain at time of tourniquet deflation in favor of LA+T (difference in means 1.18, 95%CI 0.412-1.939, P=0.003). Statistically significant differences in favor of LA+T in time to complete sensory block (difference in means 2.21min, 95%CI 1.78-2.65, P<0.001) and time to complete motor block (difference in means 1.58min, 95%CI 0.54-2.62, P=0.003) were noted. Sensory and motor block recovery times were not significantly different. Duration of post-operative analgesia defined as time to first pain medication requirement (difference in means 38.48min, 95%CI 4.31-72.66, P=0.027), and intra-operative fentanyl use (difference in means 19.08micrograms, 95%CI 4.21-33.94, P=0.012) favored LA+T, though the latter was compared in only two studies. Rates of adverse effects including nausea, vomiting and skin rash were not significantly different, though not all studies reported these outcomes.

Discussion

To date, individual randomized controlled trials assessing the use tramadol in IVRA have been largely hampered by a lack of statistical power. Consequently, previous systematic reviews have not recommended the use of tramadol in IVRA.

References