

REVIEW ARTICLE

An Effective Treatment in the Austere Environment? A Critical Appraisal into the Use of Intra-Articular Local Anesthetic to Facilitate Reduction in Acute Shoulder Dislocation

Fraser John Gould, MBChB, MRCSEd, MRCEM

From the British Antarctic Survey Medical Unit, South Georgia & the South Sandwich Islands.

Acute shoulder dislocation is a common injury in the outdoor environment. The objective of this systematic review of the literature was to determine if intra-articular local anesthetic (IAL) is an effective treatment that could have prehospital application. A methodical search of MEDLINE, PubMed, and EMBASE databases targeted publications from January 1, 1990 until January 1, 2017. Eligible articles compared IAL with other analgesic techniques in patients 16 years or older experiencing acute glenohumeral dislocation. Reduction success, complications, and patient-reported outcome measures underwent comparison. All identified publications originated from the hospital setting. Procedural success rates ranged widely among randomized control trials comparing IAL with intravenous analgesia and sedation (IAL 48–100%, intravenous analgesia and sedation 44–100%). A pooled risk ratio [RR] favored intravenous analgesia and sedation (RR 0.91, 95% confidence interval [CI] 0.84–0.98), but there was significant inconsistency within the analysis ($I^2 = 75\%$). IAL provided lower complication rates (4/170, 2%) than intravenous analgesia and sedation (20/150, 13%) (RR 1.11, 95% CI 1.04–1.19, $I^2 = 63\%$). One trial found a clinically relevant reduction in visual analogue pain scores when comparing IAL against no additional analgesia in the first minute (IAL 21 ± 13 mm; control 49 ± 15 mm; $P < 0.001$) and fifth minute (IAL 10 ± 10 mm; control 40 ± 14 mm, $P < 0.001$) after reduction. The results suggest that IAL is an effective intervention for acute anterior shoulder dislocation that would have a place in the repertoire of the remote physician. Further research might be beneficial in determining the outcomes of performing IAL in the prehospital setting.

Keywords: glenohumeral, analgesia, lidocaine, remote

Introduction

Acute shoulder dislocation is a common injury in people undertaking recreational activities in the outdoor environment.¹ In a 2-year observational study conducted between 2011 and 2012 in the Swiss Alps, 27% of all isolated limb injuries requiring helicopter rescue and prehospital physician attendance involved the humerus and shoulder (315/1156 patients). Dislocation was the second most common presumptive diagnosis in this series (19% of all injuries, 216/1156). Fracture was the most frequent

presumptive diagnosis (38%, 441/1156).² Dislocation of the glenohumeral joint is traditionally treated within the emergency department using closed manipulation to achieve reduction. Current literature suggests that attempts at reduction are best performed at the site of trauma, reducing the pain experienced by the patient and the risk of vascular and neurological complications.^{3,4} Radiographic confirmation of a dislocation in this setting would not be possible, but in a retrospective study examining 7209 shoulder dislocations, less than 1% of patients between the ages of 20 and 40 years had an associated fracture complicating glenohumeral joint subluxation.⁵ A fracture dislocation in this demographic was unlikely unless the clinical suspicion of a fracture was particularly high or the patient had experienced a high-energy traumatic mechanism of injury.

Corresponding author: Fraser John Gould, King Edward Point Research Station, South Georgia, c/o British Antarctic Survey, Port Stanley, Falkland Islands, SIQQ 1ZZ, South Atlantic; e-mail: f.gould@nhs.net.

Submitted for publication October 2016.

Accepted for publication September 2017.

Intra-articular local anesthetic (IAL) injection is a recognized and practiced analgesic technique to aid shoulder reduction in hospital, as evidenced in a 2011 Cochrane review.⁶

The objective of this investigation was to establish through a comprehensive literature review whether IAL is an effective analgesic treatment for acute shoulder dislocation, in comparison to other forms of analgesia that may be available to a remote practitioner.

Methods

A targeted search of the MEDLINE, PubMed, and EMBASE databases, mapping to Medical Search Headings “anesthesia, local” and “shoulder dislocation” yielded the initial journal articles. Additional direct searching for “shoulder dislocation AND local anesthetic” was performed within the same database selection. Duplicate publications were removed, and abstracts were screened to assess for eligibility. Publications were included from January 1, 1990 until January 1, 2017. There were no pending trials registered on the European Clinical Trials Register on January 1, 2017.⁷ Eligible articles were randomized controlled trials (RCTs), systematic reviews, and meta-analyses that compared IAL with any other forms of analgesia, or no analgesia, in patients aged 16 years or older experiencing acute glenohumeral dislocation. Any case series or cohort study conducted in the prehospital setting involving the use of IAL was eligible for inclusion. The references cited in published systematic reviews were screened for further sources.

Qualitative assessment of RCTs used the modified Jadad quality scale components.⁸ This is an 8-point scale evaluating randomization methods, blinding, withdrawals and dropouts, inclusion and exclusion criteria, adverse events, and statistical analysis in RCTs. The modified Jadad scale accounts only for double blinding, but this may be difficult to achieve when providing analgesia for shoulder reduction. Attempts at single blinding were also included during critical appraisal. Preferred reporting items for systematic reviews and meta-analyses guidelines⁹ aided this literature review when comparing the results of review articles on this topic. Only the results from primary studies were included for data analysis. Success of shoulder reduction, rates of complication, and patient-reported outcome measures were the intended outcomes for comparison. Some complications may have been attributable to reduction technique as opposed to analgesic method. In an attempt to reduce bias, all complications reported were hand checked in the relevant article. Adverse events related to intravenous

analgesia and sedation (IVAS) were included if they were recognized complications of sedation, as defined by the World Society for Intravenous Anesthesia.¹⁰ The minimum clinically significant reduction in 100-mm visual analogue pain scores was defined as >9 mm.¹¹ VAS scores can be compared with 10-point verbal pain scales by dividing the result in millimeters by 10; therefore, a difference of 1 point was deemed clinically significant in articles using a 10-point scale.

Statistical comparisons were performed using RevMan 5.2 software. A P value of <0.05 was considered to be significant. The risk ratio (RR) was calculated using a Mantel-Haenszel fixed effects model, and heterogeneity was evaluated across applicable studies using the I^2 test as a measure of inconsistency. A forest plot was used to display results where possible.

Results

LITERATURE SEARCH

Database searching identified 116 articles. After duplicate removal, there were 44 original articles. On review of the abstracts, 15 articles met the inclusion criteria. One RCT was excluded because it looked exclusively at secondary dislocations,¹² the definition of which was unclear in the manuscript. A total of 4 meta-analyses^{6,13–15} and 8 RCTs^{16–23} compared the use of IAL with IVAS. One RCT compared IAL with nitrous oxide,²⁴ and another compared IAL against use of no additional analgesia.²⁵ All of the publications originated from the hospital rather than prehospital setting. No study included patients with posterior shoulder dislocation. There were no publications comparing IAL against oral analgesia. Qualitative analysis has been included in Table 1.^{16–25}

IAL VS IVAS

Eight RCTs identified compared IAL against IVAS.^{16–23} These trials all reported successful closed reduction as a primary outcome (Table 2^{16–25}). The local anesthetic injected was 1% lidocaine in all studies, but IVAS agents varied. Reported success rates ranged widely among studies (IAL 48–100%, IVAS 44–100%). The cumulative risk ratio between the 2 analgesic strategies favored the use of IVAS (RR 0.91, 95% confidence interval [CI] 0.84–0.98), but there was significant inconsistency when comparing primary outcomes ($I^2 = 75\%$).

Across 7 studies, a 2% complication rate was recorded from 170 patients treated with IAL (3 cases of drowsiness,¹⁶ 1 of psychological agitation interfering with the procedure¹⁸). These have been included in the analysis

Download English Version:

<https://daneshyari.com/en/article/8557969>

Download Persian Version:

<https://daneshyari.com/article/8557969>

[Daneshyari.com](https://daneshyari.com)