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Effectiveness, safety, and predictive potential in ultrasound-guided stellate ganglion blockades for the treatment of sympathetically maintained pain

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Background

Evaluating the effectiveness of stellate ganglion blockades proves challenging as criteria defining a successful blockade, are controversial. This may be one reason for the lack of studies on this topic, thus forcing clinical guidelines to remain conservative in recommending sympathetic blockades. Despite high importance and clinical relevance, factors to predict which patients benefit from blockade series, are not yet available. Further, only few reports exist on incidences of complications.

Objectives

Objectives are to quantify the pain reduction of ultrasound-guided stellate ganglion blockades in a clinical setting, to identify a factor suitable for the prediction of pain reduction, and to quantify complications in the ultrasound-guided method.

Methods

This study retrospectively analyzes 809 ultrasound-guided stellate ganglion blockades in 105 patients with complex regional pain syndrome (CRPS) and neuropathic pain syndromes (all potentially exhibiting sympathetically maintained pain). Magnitude of pain, volume and type of local anesthetic, temperature of the dorsal hands, heart rate, blood pressure, and the occurrence of Horner's syndrome or complications were assessed.

Results

Pain reduction after a blockade series was highly significant ($p < 0.001$) for the entire study population and for diagnoses separately. Pain was reduced from 4.8 to 2.7 points on the NRS for the entire study population and from 4.4 to 2.4 and 5.4 to 3.1 for CRPS patients and NP patients respectively. Pain reduction showed no significant correlation with either change of temperature, vital signs, or Horner's syndrome. Unprecedentedly, a predictive factor for pain reduction is presented. For patients with neuropathic pain, predictive potential for pain reduction following a series lies within the magnitude of pain reduction after the first blockade. Additionally, a literature comparison showed current incidences of complications to be lower than in non-ultrasound-guided techniques.

Conclusions

Data indicate that ultrasound-guided stellate ganglion blockades are safe and effective in reducing sympathetically maintained pain in patients with CRPS and neuropathic pain syndromes. Pain reduction after the first blockade may predict total pain reduction after a blockade series. Other clinical measures seem unsuitable to predict effectiveness. Hence, application of a "diagnostic" blockade appears sensible. Further, ultrasound-guidance seems to reduce the incidence of complications. Still, reliable studies on this topic are scarce and additional evidence would be valuable.