Acute traumatic compartment syndrome: a systematic review of results of fasciotomy
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CRD summary
This review assessed diagnosis and treatment of acute compartment syndrome with fasciotomy and concluded that mortality and morbidity outcomes were better if fasciotomies are performed within six hours of the onset of symptoms. The review question was unclear and most aspects of the review process were poorly reported and as a result the reliability of the conclusion is uncertain.

Authors' objectives
The authors appeared to evaluate the effects and effectiveness of different strategies for diagnosis of acute compartment syndrome and fasciotomies in its treatment.

Searching
PubMed was searched for relevant studies. No date or language restrictions were reported. Search terms were not reported.

Reference lists of retrieved articles and general reviews and book chapters were searched to identify further relevant studies.

Study selection
It appeared that studies of any design that included patients who had been diagnosed with acute compartment syndrome of the extremities and subsequently treated with fasciotomies were eligible for inclusion. Patients with chronic or non-traumatic compartment syndrome were excluded.

Within included studies, study size (number of fasciotomies) appeared to range from one to 643 fasciotomies. Study publication dates ranged from 1973 to 2008. Injury sites included arms and legs. Further study details were reported in the paper and associated appendixes.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data extracted included diagnostic methods, site and type of injury, time between diagnosis and fasciotomy and final outcome.

The number of reviewers involved in data extraction was not reported.

Methods of synthesis
A narrative synthesis was used to assess different diagnostic strategies.

To assess the effects of fasciotomy, patient outcomes were categorised into one of four types: acceptable outcomes, unacceptable outcomes, amputations and deaths. These outcomes were tabulated, subdivided by duration between diagnosis and fasciotomy and discussed.

Results of the review
Fifty-five studies (1,920 fasciotomies) were included in the review.

Diagnosis results: According to two studies that compared criteria used to diagnose acute compartment syndrome with
fasciotomy outcome, pressure monitoring was an unreliable indicator with low specificity that led to more fasciotomies than necessary being performed.

Final outcome results (41 studies, 1,395 patients): Reported numbers of patients with each outcome were: 1,003 patients (72% reported as 73%) had outcomes the reviewers classed as acceptable; 249 (18%) had outcomes the reviewers classed as unacceptable; 75 (5.5%) had amputations the reviewers attributed to acute compartment syndrome (out of 83 total amputations); and 46 (3.3%) died due to acute compartment syndrome complications (out of 60 deaths in total).

Time from admission or diagnosis to fasciotomy appeared to affect the outcome. Of 717 patients who had fasciotomies with six hours of admission or diagnosis, 632 (88%) had an outcome the reviewers classified as acceptable; of the 94 patients who had fasciotomies more than 12 hours after admission or diagnosis, 12 (15%) had acceptable outcomes.

Authors' conclusions
The results indicated that for diagnosis, no study was able to demonstrate a useful addition to the known set of symptoms commonly used. For duration between diagnosis and fasciotomy, there was clear evidence to suggest that fasciotomies performed within six hours of the onset of symptoms produced better morbidity and mortality outcomes than if the delay was longer.

CRD commentary
The review question or questions appeared unclear. Study selection criteria were broad and unclear in terms of outcomes. The search appeared adequate. Study selection and data extraction stages of the process were not reported clearly; it was unclear how many reviewers were involved in these stages of the review process. No assessment of study quality was reported, although many primary study details were included in the review appendix. No clear research questions were specified regarding the effectiveness of different methods of diagnosis and as a result the method of synthesis was unclear. In assessing the outcome of fasciotomy, the research questions and methods of data synthesis appeared clearer, but no formal statistical tests were conducted to assess the reliability of the conclusions drawn. It appeared that time from diagnosis, time from onset of symptoms and time from admission were interpreted as interchangeable, which reflected poor reporting in the primary studies and rendered the reliability of the results and conclusion unclear. Overall, because many aspects of the review were unclear, the reliability of the conclusions is uncertain.

Implications of the review for practice and research
Practice: None stated.

Research: The authors stated that comprehensive prospective observational studies in large trauma centres may prove useful for learning more about incidence, test diagnostic strategies, dangers of delay and therapeutic strategies for acute compartment syndrome.

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