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ScienceDirect
Physical Therapy in Sport 7 (2006) 201–209
Physical Therapy in sport
www.elsevier.com/locate/yptsp

Literature review

The physiotherapy management of muscle haematomas

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Received 10 June 2005; received in revised form 8 May 2006; accepted 14 June 2006

Abstract

Muscle haematomas may present in athletes following a muscle tear or contusion injury. The objective of this literature review was to examine the literature pertaining to the physiotherapeutic management of muscle haematomas. An electronic literature search was performed of the databases AMED, Cinahl, Embase, PEDro and Ovid Medline from their inception to April 2006. Human and animal subject, clinical trials, written in English, which could assist in the assessment of this topic, were included. Seventeen (of 7794) papers met the inclusion criteria and were reviewed. The review concluded that few clinical trials have been published assessing the efficacy of these strategies. Furthermore, since numerous methodological weaknesses plagued the limited evidence-base, it was not possible to support or refute the application of different physiotherapy modalities, for the treatment of muscle haematomas. Further study is recommended to identify the best therapeutic interventions to treat muscle haematomas.

Keywords: Muscle haematoma; Physiotherapy; Physical therapy; Literature review

1. Introduction

A haematoma is a local accumulation of blood in a tissue, space or organ (Klein, 1990; O'Donoghe, 1984). In muscles, this can develop directly after an impact or contusion, or indirectly following a tear or rupture of muscle fibres (Hutson, 1996; Klein, 1990; Williams, 1980). Either mechanism of injury causes biomechanical failure of muscle, connective tissue and vascular tissues, and initiates localised bleeding which collects to form a haematoma (Bird, Black, & Newton, 1997; Hutson, 1996). Consequently, muscle haematomas are most prevalent in people who participate in contact sports such as rugby and football (Rothwell, 1982). The most susceptible sites of injury are the biceps brachii and quadriceps regions (Gray, 1977; Hutson, 1996; Williams, 1980).

The purpose of this paper is to examine the literature pertaining to the physiotherapeutic management of muscle haematomas. Firstly, a brief discussion of the factors involved in the management of this condition shall be described. Following which, a literature review of various physiotherapy interventions used to treat muscle haematomas, shall be presented to determine the evidence-base's strengths and weaknesses. Recommendations may then be made to inform best practice and future research priorities.

2. Types of haematoma

There are two types of muscle haematoma:

- *Intramuscular haematomas*: In this instance, the muscle sheath or fascia remains intact, confining a bleed within the muscle (Bird et al., 1997). This causes an increase in intramuscular pressure, counteracting the bleed as capillary beds become compressed. Signs and symptoms remain localised to the site of injury.

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1466-853X/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ptsp.2006.06.001

Swelling may persist and increase beyond the first 48 h as the presence of blood can produces an osmotic gradient (Peterson & Renström, 2001). This causes interstitial fluid to be drawn through the sheath, to offset the gradient, contributing to swelling until the muscle sheath will no longer stretch, or its anatomical position will not permit further expansion (Klein, 1990; Peterson & Renström, 2001). Other symptoms may include pain/tenderness, particularly within the first 3 days, a major loss of muscle function through decreased contractility and extensibility, and some bruising (Norris, 2000; Renström, 2003). Discolouration may appear a few days after injury (Klein, 1990).

- *Intermuscular haematomas*: In this type, the muscle fascia is torn, allowing a bleed to spread between muscles and fascia. Subsequently dramatic bruising and swelling typically appears distal to the injured area due to gravity (Peterson & Renström, 2001). Discolouration and swelling may be pronounced within hours after injury (Klein, 1990). Unlike intramuscular haematomas, patients report that pain subsides during the first 24 h (Klein, 1990; Renström, 2003).

3. Diagnosis

A superficial haematoma may be identified by marked bruising, swelling and potential muscle impairment. Deeper haematomas may be more difficult to diagnose (Klein, 1990). In such instances, ultrasound scanning and magnetic resonance imaging may be useful. Gray (1977) advocated a 'wait and see' policy for haematoma diagnosis and treatment, citing that it is almost impossible to determine the exact degree of damage in the first hours after injury, particularly as intramuscular haematomas may continue to develop over the first 3 days post-injury. Only after 12–72 h post-injury can a precise diagnosis be made (Gray, 1977; Klein, 1990).

4. Prognosis

Good prognostic indicators include decreased swelling, reduction of pain and tenderness, restoration of muscle function, and appearance of diffuse discolouration, in the first 24 h (Klein, 1990). Poor prognostic indicators include increase and fluctuating swelling after 24 h, persistent swelling after 48–72 h, increased pain intensity, extension of tenderness from the site of injury, prolonged restricted limb range of movement by pain or muscle weakness, and potentially, diminished distal pulses or numbness and paraesthesia below the injury (Klein, 1990).

The prognosis for intermuscular haematomas is better than that of the intramuscular type (Renström, 2003). Since early mobilisation is preferable for intermuscular haematomas, such patients may return to sporting activities from between 1 and 13 weeks post-injury (Jackson & Feagin, 1973; Peterson & Renström, 2001; Prentice, 2004; Ryan, Wheeler, Hopkinson, Arciero, & Kolakowski, 1991). Depending on the severity of injury, intramuscular bleeds need to be treated with more caution due to the risks of myositis ossificans (Gray, 1977). Furthermore, with greater localised pain and swelling, such patients may not return to sports from approximately 2–5 months post-injury (Jackson & Feagin, 1973; Peterson & Renström, 2001; Ryan et al., 1991).

5. Complications

Although muscle injuries usually resolve uneventfully, complications may occur. Myositis ossificans is a serious and relatively common complication, (Hutson, 1996; Lachmann & Jenner, 1994; Williams, 1980). Although the cause of myositis ossificans remains unknown (Hutson, 1996), it appears to follow contusion injuries, with intramuscular haematomas being at greater risk of developing calcification (Gray, 1977). Calcium may be deposited and solidify between several fibres in the muscle belly or form a spur to project from the underlying bone. It can be diagnosed and monitored by serial X-rays, being radiological evident 3–6 weeks after injury (Peterson & Renström, 2001; Prentice, 2004). Such patients would present with significantly reduce movements, tenderness, swelling and hardening of the muscle on palpation (Larson, Almekinders, Karas, & Garrett, 2002). It may be found following a contusion to the quadriceps and bicep brachii muscles and is managed by rest and gentle rehabilitation to allow the absorption of calcium over several months (Larson et al., 2002; Prentice, 2004). If not managed accordingly, myositis ossificans may develop to permanently limit range of movement and function, requiring surgical intervention to remove persistent calcium deposits (Larson et al., 2002; Williams, 1980). The incidence of myositis ossificans varies according to the severity of the precipitating contusion, with severe recurrent contusions giving rise to myositis ossificans more often (Prentice, 2004). Although this condition may persist for some months, it is often asymptomatic, and, in these cases, may be managed as any other muscular contusion (Larson et al., 2002).

Cyst formation may occur when the liquid centre of a haematoma fails to absorb (Williams, 1980). These often resolve over time, however, needle or surgical aspiration may be required if localised swelling persists after a few weeks post-injury.