Topical **anti-inflammatories** for acute **musculoskeletal** conditions

Jacky van Schoor, MPharm
Amayeza Info Services

Acute pain is often associated with injury, including musculoskeletal injuries such as strains and sprains and over-use injuries, or soft tissue injuries like muscle soreness or cramps. Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used for the treatment of acute pain. They reversibly inhibit cyclo-oxygenases (COX), the enzymes involved in the production of prostaglandins which, among many other functions, play an important role in inflammation and pain perception.

Topical NSAIDs are formulated for direct application to the painful area to produce a local pain-relieving effect while avoiding the body-wide distribution of the drug. Topical application limits the use of these products to the treatment of more superficial conditions such as sprains, strains and muscle or tendon pain. They are not appropriate for use on broken skin and would not be used for the treatment of open wounds.

For a topical formulation to be effective, it must first penetrate the skin. Only when the drug has entered the lower layers of the skin can it be absorbed by blood and transported to the site of action, or penetrate deeper into areas where inflammation has occurred.

Individual drugs have different degrees of penetration. In addition, the formulation is also an important factor to consider to ensure good penetration through the skin. For example, creams and lotions have been shown to be generally less effective in penetrating the skin when compared with gels and sprays.

Once the drug reaches the site of action, it must be present in high enough concentrations to inhibit the COX enzymes and produce pain relief. Studies, however, have shown that tissue levels of NSAIDs applied topically do reach levels high enough to inhibit the COX enzymes. The blood levels of the NSAIDs applied topically are only a fraction (usually less than 5%) of the blood levels when the NSAID is taken orally. Topical application of NSAIDs can therefore limit side-effects of the NSAID by increasing its local effects and minimising the levels of the NSAID in the rest of the body.

A review of 61 studies looked at the effectiveness and safety of topical NSAIDs when used for the treatment of acute musculoskeletal pain. Most studies compared topical NSAIDs in the form of a gel, spray or cream with a similar topical placebo (dummy product). In this review, it was shown that topical NSAIDs provided good levels of pain relief in acute conditions such as sprains, strains and overuse injuries, probably similar to that provided by oral NSAIDs. Gel formulations provided the best effects and adverse effects were usually minimal. The study concluded that the use of topical NSAIDs to treat acute musculoskeletal conditions has become widely accepted because they can provide pain relief without associated systemic effects.

Bibliography

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