

# Should NSAIDs be routinely used in the treatment of sprains and strains?

Although non-steroidal anti-inflammatory drugs have been used as first-line treatment for sprains and strains in the past, their use needs to be evaluated given the current evidence available which suggests a potential for problems, says **Rhiannon Braund**

**S**prains and strains of the ankle are the most common sporting injury, and ankle sprains alone are reported to account for 15 per cent of all sports injuries.<sup>1-4</sup> While these types of injuries are usually considered minor, they may be significant due to their frequency and symptoms, and should be taken seriously due to their potential to cause chronic pain, swelling and functional instability.<sup>2,5</sup> Measures such as rest, ice, and compression are crucial to aid healing and pharmacists are often approached to suggest and provide drug treatments to reduce pain and inflammation.

Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen and diclofenac, have been used immediately post-injury and have been considered to be the best drug treatment due to their analgesic and anti-inflammatory effects.<sup>6,7</sup> However, there is accumulating evidence that the short-term benefits of NSAIDs are outweighed by adverse effects on long-term healing. This is because inflammation is a necessary part of the healing process. Without it healing cannot take place.<sup>6</sup>

## Sprains and strains

Sprains refer to injuries of ligaments, which can be stretched, partially torn or completely torn. These are classified by three grades of sprain:<sup>8</sup>

- A grade 1 (mild) sprain is mildly excessive stretching of the ligament that is generally associated with limited swelling or tenderness
- A grade 2 sprain (moderate) has partial macroscopic tears of the ligaments and is associated with increased pain and swelling
- A grade 3 sprain (severe) is a complete rupture of the ligament and will often require surgical intervention

Strains refer to damage to muscles and or tendons. The damage is often at the myotendonous junctions (where the muscle and tendon meet).<sup>9</sup> Strains are also graded:<sup>10</sup>

- Grade 1 and grade 2 strains involve muscle fibre damage where the muscle sheath remains undamaged

**Rhiannon Braund**, BPharm, MPS(NZ), is lecturer in clinical pharmacy practice at the School of Pharmacy, University of Otago, PO Box 913, Dunedin, New Zealand (e-mail rhiannon.braund@stonebow.otago.ac.nz)



**Sprain and strain injuries are common and may be treated in pharmacies**

- A grade 3 strain is a partial rupture of both the muscle and sheath
- A grade 4 strain indicates a complete rupture

Sprains and strains can occur simultaneously and there is often complexity of the injury, which has been called “sprained ankle syndrome”.<sup>11</sup> When clinicians evaluate injuries that might be a sprain or a strain or both, it is also important not to rule out the possibility of an accompanying fracture.

The mechanism and details of injury can aid in the diagnosis of ankle injuries.<sup>4</sup> For example, the intensity of force may indicate the extent of damage. An injury associated with high impact may suggest more damage and the risk of a fracture increases. Inability to walk or bear weight immediately following

injury may indicate more severe damage such as a fracture or complete tear. Although it is difficult to differentiate a sprain from a strain, both initiate an inflammatory response and they are generally treated similarly. Inflammation acts to limit the amount of damage (ie, haemostasis to prevent bleeding), to protect from further damage (ie, swelling to immobilise the joint) and to initiate healing (via macrophages to remove debris and growth factors to promote regeneration). This acute inflammatory phase is usually transient lasting 24–48 hours.<sup>9,12,13</sup>

## Pharmacist's role

Given the frequency of these injuries, the belief that many of them are minor and can be self-treated, in conjunction with the increasing availability of medicines available over-the-counter (OTC), particularly analgesics,<sup>14</sup> pharmacists will play a greater role in advising treatment for their patients. Evidence shows that patients perceive OTC analgesics as “safe” and consequently they are often taken inappropriately.<sup>15</sup> Pharmacists are able to provide early assessment and initiating appropriate treatment early will reduce the risk of further damage.<sup>3</sup> With the increasing evidence that using NSAIDs immediately post-injury may be, in fact, detrimental, it is important that pharmacists are aware of the potential risks so they can provide patients with good advice.

## Treatment recommendations

It is most important for pharmacists first to determine if referral is needed. As discussed above, a good history and observation of a patient's ability to walk or use the affected limb may give an indication of the severity of an injury. Use of a pain scale and common questions about how a person's abilities are limited may also be helpful. Other warning signs are highlighted in Panel 1. Pharmacists should refer if there is the possibility of fracture, dislocation or complete tear, or if there is any doubt as to the seriousness of the injury.

Appropriate treatment of sprains and strains in the first 48 hours after the injury includes rest, ice, compression, and elevation (RICE, see Panel 2).<sup>3,10</sup> RICE should be the mainstay of treatment in the initial period following injury and HARM (heat, alcohol, running exercise and massage) should be avoided. Oral analgesics are important in the treatment of pain, but caution should be used because they can mask symptoms that may suggest more severe damage.

## Panel 1: When to refer

- When the patient cannot weight bear
- When there is numbness
- When there is obvious deformity
- When there is severe pain and swelling
- When there is no improvement after a few days
- If there is any doubt of the severity of the injury

Historically, recommendations for treatment have included early aggressive use of NSAIDs in the belief that, by halting inflammation, the pain and swelling would decrease and there would be a faster return to activity<sup>6,16</sup> and that this would lead to improved outcome and reduced disability.<sup>17</sup> However, there has been little evidence to support this theory. Studies have shown conflicting results and a recent meta-analysis was critical of the methodological quality of many studies.<sup>7,12,18</sup> Some research has shown that NSAIDs are effective in decreasing pain and swelling associated with sprains and strains, although this may be due to analgesic rather than the anti-inflammatory effects.<sup>3,19</sup> In contrast, another study showed that patients with more severe sprain and strain injuries treated with placebo had lower pain scores than those given NSAIDs; this was thought to indicate that healing was delayed in the NSAID group.<sup>20</sup>

Debate has continued on the use of NSAIDs for the treatment of sprains and strains because some research has shown that using NSAIDs can lead to an earlier return to activity.<sup>21</sup> Conversely, one of the roles inflammation and pain play in healing is to limit movement to prevent further damage and returning to activity faster may increase the risk of recurrence.<sup>22,23</sup>

Concern has been raised over the use of NSAIDs early in therapy because the initial inflammatory response coincides with muscle repair, regeneration and growth.<sup>13</sup> Inflammation is a necessary component in the healing process and without it repair would not take place.<sup>6,10</sup> Thus, decreasing inflammation may impair the healing process and result in a delay of tissue repair.<sup>3</sup> Current evidence suggests that if these medicines are used too early following injury, they will reduce the inflammatory response and may actually delay acute healing, slow muscle regeneration and compromise long-term healing.<sup>2,6,12</sup> There is also potential for increased bleeding and swelling at the site of injury due to NSAIDs decreasing platelet aggregation.<sup>16</sup>

Due to efficacy, cost and side effect profile, paracetamol is regarded as the initial choice for most mild to moderate acute pain.<sup>24</sup> In some situations such as menstrual pain, NSAIDs may show a greater analgesic efficacy than paracetamol,<sup>24</sup> but there is no evidence that this is the case in soft tissue injuries because there has been no large clinical trial that has compared NSAIDs with paracetamol for these types of injuries.<sup>7</sup> In fact

there are recommendations that paracetamol should be used first line because they may be just as effective analgesics as NSAIDs and will not increase bleeding into the injury site or potentially impair healing.<sup>25,26</sup> When paracetamol is only partially effective, the addition of a centrally acting analgesic, such as codeine, may be an option to treat pain temporarily.

## Conclusion

Sprain and strain injuries are common and with increasing access to OTC analgesics more of these injuries may be treated in pharmacies. The mainstay of treatment should be RICE. This is important as it acts to minimise bleeding and inflammation without stopping the influx of key factors needed for healing. However, since these injuries can be painful there will be requests for analgesics. Although NSAIDs have been used as first-line treatment, their use needs to be evaluated given current evidence suggesting a potential for problems.

With the additional risk of NSAID side effects and their potential to blunt the normal healing process, it is important to consider whether their use is appropriate for treating sprains and strains and, particularly, whether they should be avoided in the first 24–48 hours post-injury. It has been suggested that low risk analgesics may be just as effective in the treatment of these injuries.<sup>25,26</sup> Thus,

## Panel 2: RICE

- **Rest** — reduce the length of time spent moving the affected joint, thereby preventing further damage.
- **Ice** — apply for up to 20 minutes every two hours for the first two or three days. The effects are to relieve pain and minimise blood flow to the area. The combination of pressure and ice is more effective than ice alone at controlling swelling.
- **Compression** — minimises swelling and limits joint movement, reducing further damage.
- **Elevation** — decreases oedema at the site of the injury.

paracetamol with or without codeine may be the most appropriate choice for most patients especially in the first 24–48 hours.

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