Assessment of acute and chronic pain

Lesley Green

Abstract

Acute and chronic pain states are under-recognized and under-treated. The assessment of pain and evaluation of treatment requires repeated measurement of pain intensity using reliable and well-validated scales. Sensory components of pain must also be assessed and in particular, the diagnosis of neuropathic pain should not be missed as this diagnosis may direct treatment and potentially alter long-term outcomes. Several neuropathic screening tools are available to aid the detection and monitoring of neuropathic pain but importantly, a clinical examination is essential to corroborate this diagnosis. The further assessment of chronic pain should involve a thorough assessment of global function and quality of life using reliable and well-validated screening tools. In particular, physical and emotional functioning should be monitored.

Keywords Assessment; hyperalgesia; neuralgia; pain; pain measurement; pain; postoperative

Royal College of Anaesthetists CPD matrix: 1D01, 2E03, 3E00

Pain can be described as acute or chronic and is labelled as chronic if it persists for at least 3 months. Acute, uncontrolled pain can lead to adverse physiological changes in several organ systems and cause undue psychological stress. The severity of acute postoperative pain has also been associated with development of persistent post-surgical pain, the incidence of which can vary between 10 and 50%. The incidence of chronic pain is approximately 20% and is associated with a huge psychological and social burden.

Pain intensity measurement

Pain measurement should include all domains that represent the multidimensional nature of pain. Pain intensity measurement is an essential assessment. This may include the Visual Analogue Scale (VAS), Numerical Rating Scale (NRS) and/or Verbal Rating Scale (VRS) (Figure 1). Importantly, the VAS and NRS are similar but not interchangeable such that a score of 70 mm on the VAS does not equal a score of 7 on the NRS. They do, however, show greater sensitivity to change than the VRS. Currently, the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT) (Box 1) recommends the NRS for use in clinical trials because of its ease of administration, patient preference and ease of completion especially by the elderly and those taking opioids. It can also be verbally administered. The NRS for ‘pain at its worst’ may sometimes be more sensitive to change than ‘average pain’ and for monitoring purposes, a reduction of two points on the NRS is considered clinically meaningful. Interestingly, the Global Impression of Change (GIC) as judged by the patient (PGIC) or clinician (CGIC) is more sensitive to treatment effects than NRS/VAS measurement in neuropathic pain. Pain intensity should also be measured at rest and during movement in both acute and chronic settings. In acute pain, relief of dynamic pain may reduce the risk of cardiopulmonary and thromboembolic complications.

Neuropathic pain diagnosis

The successful treatment of pain depends on the accurate identification of the pathophysiological mechanisms. Both acute and chronic pain may be further described as nociceptive (e.g. somatic, visceral) or neuropathic in origin. Perhaps the most difficult diagnosis to make in both settings is that of neuropathic pain (NeP). This is defined as ‘pain arising as a direct consequence of a lesion or disease affecting the somatosensory system’ and arguably causes a greater decrease in health-related quality of life than nociceptive pain. The suspicion of NeP should be based on the history and examination of a patient. Specific neuropathic symptomatology should be elucidated from the history to include symptoms of loss of function such as numbness and weakness (negative signs) as well as positive signs such as allodynia and hyperalgesia. Given that up to 50% of patients with musculoskeletal pain can report classical neuropathic symptoms such as ‘shooting pains’ and ‘tingling’ and 30% with non-neuropathic pain report ‘burning’, a clinical examination is also required. Physical examination should include simple bedside sensory tests; pinprick, tactile, heat and cold stimuli.

Learning objectives

After reading this article, you should be able to:

- compare and contrast commonly used pain intensity scales
- list the advantages and disadvantages of screening tools for neuropathic pain
- name the important aspects of a multidimensional pain assessment

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should be used to detect areas of sensory disturbance such as numbness, hyperalgesia and allodynia that may corroborate a diagnosis of NeP. Sensory disturbances should correlate to all or part of a defined nerve territory. Bedside sensory tests have been traditionally used in the diagnosis of chronic neuropathic pain but increasingly, it has been recognized that they may also be useful in the detection of acute NeP. Furthermore, evidence suggests that acute, postoperative peri-incisional central sensitization can lead to chronic postoperative NeP both of which may be attenuated by the perioperative use of the N-methyl d-aspartate antagonist ketamine and intraoperative epidural analgesia. Thus, testing for the clinical correlates of central sensitization in acute pain may help guide analgesic treatment.

**Neuropathic pain screening tools**

The gold standard for the diagnosis of NeP is experienced clinical judgement. However, there are several questionnaires that may aid identification (Table 1). The DN4 and LANSS are the only well-validated, clinician-administered scales that include physical examination items thereby increasing their accuracy. The more recent StEP questionnaire demonstrated improved

### Table 1

<table>
<thead>
<tr>
<th>Screening tools for neuropathic pain detection</th>
<th>Validated in</th>
<th>Physical exam items included</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPSa</td>
<td>Chronic neuropathic pain</td>
<td>No</td>
<td>Brief well-validated for treatment monitoring</td>
<td>Does not assess shooting, electrical or tingling pain</td>
</tr>
<tr>
<td>NPQb</td>
<td>Chronic neuropathic pain</td>
<td>No</td>
<td></td>
<td>66% sensitivity</td>
</tr>
<tr>
<td>DN4c including neuropathic LBP</td>
<td>Chronic neuropathic pain</td>
<td>Yes</td>
<td>83% sensitivity, 90% specificity (80% sensitivity 92% specificity in neuropathic low back pain) Clinician-administered</td>
<td>Not specifically validated in low back pain</td>
</tr>
<tr>
<td>LANSSd</td>
<td>Chronic neuropathic pain</td>
<td>Yes</td>
<td>85% sensitivity, 80% specificity Well-validated Used for screening and monitoring Clinician-administered but self-report version also available (S-LANSS)</td>
<td>Possibly more difficult to complete</td>
</tr>
<tr>
<td>painDETECT</td>
<td>Neuropathic back pain</td>
<td>No</td>
<td>85% sensitivity, 80% specificity Simple to understand Validated in nociceptive, neuropathic and mixed pain populations</td>
<td>—</td>
</tr>
<tr>
<td>IDpain</td>
<td>Chronic neuropathic pain</td>
<td>No</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>NPSIe</td>
<td>Chronic neuropathic pain</td>
<td>No</td>
<td>Used for screening and monitoring Expanded version of the NPS</td>
<td>Requires assessment of reliability and validation in other neuropathic pain</td>
</tr>
<tr>
<td>PQASf</td>
<td>Carpal tunnel syndrome only</td>
<td>No</td>
<td>Used for screening and monitoring</td>
<td>—</td>
</tr>
<tr>
<td>StEPg</td>
<td>Neurpathic LBP</td>
<td>Yes</td>
<td>Sensitivity 92%, specificity 97% Clinician-administered</td>
<td>—</td>
</tr>
</tbody>
</table>

a Neuropathic Pain Scale.
b Neuropathic Pain Questionnaire.
c Douleur Neuropathique en 4 questions.
d Leeds Assessment of Neuropathic Symptoms and Signs pain scale.
e Neuropathic Pain Symptom Inventory.
f Pain Quality Assessment Scale.
g Standardized Evaluation of Pain.
accuracy for neuropathic low back pain (LBP) diagnoses although subsequently the DN4 has shown validity in this group of patients. Interestingly, the discriminative pain descriptors and clinical tests differed significantly between the DN4 and STeP perhaps alluding to different clinical subsets of neuropathic LBP patients. Although most screening tools have only been validated in chronic NeP, the LANSS has been successfully used to identify postoperative pain of predominantly neuropathic origin; an immediate postoperative positive LANSS has been associated with a positive S-LANSS at 3 months. One proposed algorithm envisages non-pain specialists using screening tools in the context of pain of unknown aetiology. Thereafter NeP in an area of sensory deficit may lead to further investigations to establish a neurological lesion. A label of NeP, probable NeP or possible NeP would be enough to treat as NeP.

Further neuropathic pain assessment

Imaging studies may be required in the work-up for neurological lesion identification. Quantitative Sensory Testing (QST) can be used to confirm a somatosensory profile in the detection and treatment of neuropathic pain. It is time-consuming and not routinely used by clinicians. Laser evoked potentials can be used for establishing A-d fibre function in neuropathic pain with a specificity of 83% and sensitivity of 64%. Microneurography and functional brain magnetic resonance imaging (fMRI) are not currently recommended in assessment. Level B and C grade evidence exists for skin biopsy for assessing intraepidermal nerve fibres density in small fibre neuropathies. Electromyoneurography should be used to distinguish demyelinating from axonal lesions in large nerve fibre dysfunction.

Multidimensional assessment of pain

Apart from the intensity and sensory description of pain, the global impact of persistent pain on quality of life should also be assessed. Whilst IMMPACT recommendations (Box 1) were primarily designed for improving clinical trials methodology, it is important that pain clinics evaluate pain in a similar, standardized manner. Physical functioning should be monitored, with IMMPACT recommending the interference subscales of the Multidimensional Pain Inventory Interference scale or the Brief Pain Inventory. These may be replaced when a disease-specific measure is available such as the Roland Morris Disability Questionnaire for low back pain or the Western Ontario and McMaster Universities Osteoarthritis Index for example. The Beck Depression Inventory or Profile of Mood States is recommended as a measure of emotional functioning and the Short-Form McGill Questionnaire may be used to assess sensory and affective components of pain, as the subscales have shown responsiveness in chronic pain trials. These measures have been selected because of their ease of administration and proven record of validity and reliability.

In summary, acute and chronic pain evaluation requires the patient history and a tailored examination. The 0–10 NRS should be used for assessing pain intensity in most patients. Where neuropathic pain is suspected, screening tools which include clinical examination items may supplement bedside assessment and further investigation may be required to confirm a diagnosis of neuropathic pain. Finally, the evaluation of persistent pain requires a full assessment of the impact of pain on global function and quality of life.

REFERENCES


FURTHER READING