

Acute PAIN MANAGEMENT

a human right

Acute pain management is not a luxury; it is a human right, states Dr Milton Raff, Chairperson of the World Federation of Societies of Anaesthesiologists' Pain Relief Committee in the introduction to the new South African Society of Anaesthesiologists' acute pain guidelines.

The World Health Organization defines

pain as an 'unpleasant sensory and emotional experience, associated with actual or potential tissue damage or described in terms of such damage'.

Pain is often classified as acute or chronic. Acute pain typically lasts less than three to six months, or pain that is directly related to soft tissue damage such as a sprained ankle or a paper cut. It is of short duration and gradually resolves as the injured tissues heal.

Chronic pain is generally defined as pain that typically lasts longer than three months or past the time of normal tissue healing. Chronic pain can be the result of an underlying medical disease or condition, injury, medical treatment, inflammation, or an unknown cause.

Chronic pain is persistent and is subdivided into cancer-related pain and non-malignant pain, such as arthritis, low-back pain, and peripheral neuropathy.

NEW APPROACH TO CHRONIC PAIN

According to Prof Bart Morlion, Director of the Leuven Algologisch Centrum (Belgium), chronic pain is considered as a **biopsychosocial phenomenon**, meaning a combination of physical dysfunction, beliefs, coping strategies, distress, illness behaviour and social interactions. This conceptual framework, supported by a wealth of scientific evidence, implies a multimodal and multidisciplinary treatment approach with the aim of maximising pain reduction, quality of life, independence and mobility.

THE PROGRESSION OF ACUTE TO CHRONIC PAIN

According to the authors of the South African guideline, chronic pain can develop following an acute pain episode e.g. post-operative, postzoster pain and low back pain. Approximately 1.5% of all surgical procedures results in chronic pain development.

Risk factors for the development of chronic pain are:

- ⊕ Intense and prolonged preoperative and/or post-operative pain.
- ⊕ Repeated surgery.
- ⊕ Chemotherapy and/or radiotherapy peri-operatively.

- ⊕ Postoperative complications, e.g. infection.

The authors of the guideline recommend the following:

- ⊕ Pay attention to pain control throughout the pre-, intra- and postoperative period might reduce development of chronic pain.
- ⊕ Neuroaxial blockade and nerve blocks in the peri-operative period might reduce chronic pain development by minimising central sensitisation.
- ⊕ N-methyl-D-aspartic acid receptor antagonist drugs demonstrate a preventive analgesic effect.

ADVERSE EFFECTS OF CHRONIC PAIN

PHYSIOLOGICAL IMPLICATIONS

CARDIOVASCULAR SYSTEM

The cardiovascular system responds to the stress of unrelieved pain by increasing sympathetic nervous system activity which, in turn, increases heart rate, blood pressure and peripheral vascular resistance. As the workload and stress of the heart increase, owing to hypertension and tachycardia, the oxygen consumption of the myocardium also increases. When oxygen consumption is greater than oxygen supply, myocardial ischaemia and, potentially, myocardial infarction, occur. The myocardial oxygen supply may be further compromised by the presence of any pre-existing cardiac or respiratory disease or by hypoxaemia due to impaired respiratory function. Hypercoagulation occurs when there is a reduction in fibrinolysis together with an increased cardiac rate, workload and blood pressure. This activity increases the risk of deep vein thrombosis and pulmonary embolism.

GASTROINTESTINAL SYSTEM

Increased sympathetic nervous system activity can lead to temporarily impaired gastrointestinal function. This can include delays in gastric emptying and reduced bowel motility with the potential for the development of paralytic ileus.

RESPIRATORY SYSTEM

Untreated pain can result in a patient limiting the movement of the thoracic and abdominal

muscles in a bid to reduce pain. This may cause some degree of respiratory dysfunction with secretions and sputum being retained because of a reluctance to cough. Atelectasis and pneumonia may follow. This pulmonary dysfunction, caused by painful excursion of the diaphragmatic muscles of the chest wall, is also associated with a reduction in vital lung capacity, increased inspiratory and expiratory pressures and reduced alveolar ventilation. The resulting hypoxia can cause cardiac complications, disorientation and confusion and delayed wound healing.

GENITOURINARY SYSTEM

Untreated pain can increase the release of hormones and enzymes, such as catecholamines, aldosterone, antidiuretic hormone, cortisol, angiotensin II and prostaglandins, which help to regulate urinary output, fluid and electrolyte balance as well as blood volume and pressure. This causes retention of sodium and water, resulting in urinary retention. Increased excretion of potassium causes hypokalaemia. A decrease in extracellular fluid occurs as fluid moves to intracellular compartments, causing fluid overload, increased cardiac workload and hypertension.

MUSCULOSKELETAL SYSTEM

Involuntary responses to noxious stimuli can cause reflex muscle spasm at the site of tissue damage. Impaired muscle function and muscle fatigue can also lead to immobility, causing venous stasis, increased blood coagulability and, therefore, an increased risk of developing DVT. Pain can limit thoracic and abdominal muscle movement in an attempt to reduce muscle pain, a phenomenon known as 'splinting'. The lack of respiratory muscle excursion can potentially lead to reduced respiratory function.

IMMUNE SYSTEM

Depression of the immune system can be caused by unrelieved pain. This may predispose the patient to wound infection, chest infection, pneumonia and, ultimately, sepsis.

PSYCHOLOGICAL IMPACT

As many as 50% of patients with chronic



➤ pain have a comorbid depressive disorder. Concurrent depressive symptoms in patients with chronic pain are associated with increased disability and augmented pain experience, according to Madelon Peters, a professor of experimental health psychology based at Maastricht University (The Netherlands).

Anxiety is another negative emotion frequently seen in patients with chronic pain, and which may lead to maladaptive pain behaviours aggravating and maintaining pain and disability.

Healthcare providers should be aware of and deal with these and other negative emotions because they affect the wellbeing of patients, worsen pain and can impact on treatment success, stressed Prof Peters.

Untreated pain can also result in an individual experiencing distressing cognitive impairment, such as disorientation, mental confusion and a reduced ability to concentrate.

ACUTE PAIN MANAGEMENT IN THE ELDERLY PATIENT

According to the South African Demographics Index, approximately 6.3% of the population is aged ≥65 years. Chronic conditions associated with ageing and pain, means that more and more elderly patients are presenting for treatment. These conditions include e.g. acute exacerbations of arthritis, osteoporotic fractures, cancer, acute medical conditions, such as ischaemic heart disease, vascular disease and herpes zoster, as well as surgery.

FACTORS AFFECTING PAIN CONTROL IN THE ELDERLY

Effective pain control in the elderly is complicated because of age-related alterations in pharmacokinetics and pharmacodynamics, an altered perception of pain and potential difficulties in assessment, diminished physiological reserve and concurrent diseases, and polypharmacy, which leads to an increased risk of drug interactions, write the authors.

AGE-RELATED ALTERATIONS IN PHARMACOKINETICS AND PHARMACODYNAMICS

Age-related alterations are the result of progressive physiological decline, which occurs with increasing age and the increasing likelihood of comorbid disease. Because the rate of decline can be highly variable between individuals, it is often very difficult to predict.

The authors caution that a 50% increase in sensitivity of the brain to opioids in the elderly is a pharmacodynamic change which needs special attention. The most significant

pharmacokinetic changes of which to be aware of include:

- ⊕ A 20% drop in cardiac output.
- ⊕ A 30%-50% decrease in renal function.
- ⊕ A 25% decrease in liver function.
- ⊕ Reduced protein binding due to reduced plasma protein levels.

ENSURING PATIENT SAFETY

The following are some patient safety issues that relate to pain management:

- 1** When administering sedatives, consider the patient's physical safety (e.g. using bed rails, fall precautions, assistance with ambulation).
- 2** Eliminate errors related to PCA infusions (improper dose/quantity, wrong drug, drug omission) by using systems to double-check drug and dose (e.g. bar coding, nurse-nurse checking).
- 3** Eliminate errors and complications related to catheter administration (initial dose testing, monitoring catheter and response to medication).
- 4** Non-drug techniques have minimal adverse events reported and do not pose safety issues.
- 5** Protect skin when applying heat or cold.

ALTERED PERCEPTION OF PAIN AND POTENTIAL DIFFICULTIES IN ASSESSMENT

According to the authors, the assessment of pain and an evaluation of the efficacy of treating this pain, is often more difficult in elderly patients due to differences in pain perception and the reporting of pain, cognitive impairment and difficulties measuring pain.

Pain thresholds in the elderly are often increased, which makes diagnosis more difficult when patients have comorbid conditions such as acute myocardial infarction and peritonitis. In these conditions, pain is usually the presenting symptom.

The authors pointed out that pain tolerance can be reduced in this population group, making its immediate treatment extremely important. Elderly patients often under-report pain for a number of reasons such as fear, anxiety, depression and cognitive impairment. Cognitive impairment may make the measurement of pain very difficult, write the authors, especially in the case of non-communicative elderly patients. They recommend that behaviour, such as restlessness, grunting and grimacing, needs to be assessed in these circumstances.

DIMINISHED PHYSIOLOGICAL RESERVE AND COMORBID DISEASES

The efficacy of analgesic drugs and

the techniques used to treat pain can be negatively influenced by diminished physiological reserve and comorbid diseases.

POLYPHARMACY, LEADING TO AN INCREASED RISK OF DRUG INTERACTIONS

Polypharmacy is particularly relevant when an elderly patient receives patient-controlled analgesia (PCA), according to the authors. The concomitant administration of long-acting central nervous system depressants, e.g. benzodiazepines, should therefore be avoided.

ANALGESIC TECHNIQUES IN THE ELDERLY

The authors recommend the use of multimodal drugs and techniques. Drugs should be titrated in a 'start low, go slow' manner.

PATIENT-CONTROLLED ANALGESIA

PCA should not be withheld from patients based on their age. The basic requirements are that the patient must fully understand the technique, that breakthrough pain must be reported, and that there are no contraindications to its use, write the authors. They suggest that the size of the bolus dose should be reduced and continuous background infusion avoided.

EPIDURAL ANALGESIA

Elderly patients can be safely managed with an epidural, providing there is appropriate monitoring and education. The authors recommend that the following be taken into consideration:

- ⊕ Epidural opioid requirements decrease with increasing patient age.
- ⊕ The spread of a given volume of local anaesthetic drug in the epidural space is greater in elderly patients.
- ⊕ Elderly may be more prone to side effects such as hypotension. Spinal stenosis may predispose to neurological complications. Be aware that many elderly patients may be taking anticoagulants as chronic medication. It is advised that lower doses and infusion rates should be used.

REFERENCES:

- Lundgren C, Biccarrd B, Chetty S et al.** South African Acute Pain Guidelines Official publication of The South African Society of Anaesthesiologists, 2016.
- Wells N, Pasero C and McCaffery M.** Improving the Quality of Care Through Pain Assessment and Management. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*, 2008.
- Middleton C.** Understanding the physiological effects of unrelieved pain. *Nursing Times*, 2003. **SF**



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| <p>1 The World Health Organization defines pain as an:</p> <p>a. Unpleasant sensory and emotional experience, associated with actual or potential tissue damage or described in terms of such damage. A</p> <p>b. Unpleasant sensory experience, associated with actual or potential tissue damage or described in terms of such damage. B</p> <p>c. Unpleasant sensory and emotional experience, associated with skeletal damage or described in terms of such damage. C</p> | <p>4 Acute pain typically lasts less than:</p> <p>a. One to two months. A</p> <p>b. Three to six months B</p> <p>c. Three to four months. C</p> <p>5 Chronic pain is generally defined as pain that:</p> <p>a. Typically lasts less than three months. A</p> <p>b. Past the time of normal tissue healing. B</p> <p>c. Past the time of abnormal tissue healing. C</p> <p>6 Chronic pain can be the result of an underlying medical disease or condition, injury, medical treatment, inflammation, or an unknown cause.</p> <p>a. True A</p> <p>b. False B</p> <p>7 Biopsychosocial phenomenon can be defined as:</p> <p>a. A combination of emotional dysfunction, beliefs, coping strategies, distress, illness behaviour and social interactions. A</p> <p>b. A combination of psychiatric dysfunction, beliefs, coping strategies, distress, illness behaviour and social interactions. B</p> <p>c. A combination of physical dysfunction, beliefs, coping strategies, distress, illness behaviour and social interactions. C</p> | <p>8 Untreated chronic pain has physiological and psychological implications.</p> <p>a. True. A</p> <p>b. False. B</p> <p>9 Effective pain control in the elderly is complicated because of:</p> <p>a. Age-related alterations in pharmacokinetics and pharmacodynamics. A</p> <p>b. An altered perception of pain and potential difficulties in assessment. B</p> <p>c. Diminished physiological reserve and concurrent diseases, and polypharmacy, which leads to an increased risk of drug interactions. C</p> <p>d. All of the above. D</p> <p>10 The authors of the new SA pain guideline caution that a 50% increase in sensitivity of the brain to opioids in the elderly is a pharmacodynamic change which needs special attention. The most significant pharmacokinetic changes of which to be aware of include:</p> <p>a. A 20% drop in cardiac output. A</p> <p>b. A 40%-50% decrease in renal function. B</p> <p>c. A 35% decrease in liver function. C</p> |
| <p>2 Approximately ___% of all surgical procedures results in chronic pain development.</p> <p>a. 1.6% A</p> <p>b. 1.8% B</p> <p>c. 1.5% C</p> | | |
| <p>3 The authors recommend the use of multimodal drugs and techniques in the elderly and that:</p> <p>a. Drugs should be started 'low and in a go slow' manner. A</p> <p>b. Drugs should be titrated in a 'start slow, go low' manner. B</p> <p>c. Drugs should be titrated in a 'start low, go slow' manner. C</p> | | |

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