Managing chronic pain in patients with dementia

Chronic pain is a frequent health problem in the elderly and is not part of the normal ageing process. The prevalence levels range between 45% and 80% in line with an age-related increase in patient comorbidity.¹

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Chronic pain is usually defined as lasting onwards of three months or pain that persists after an injury has fully healed.²,³ The presence of significant chronic pain is known to threaten the quality of life of older patients.¹,² Research has highlighted the association of chronic pain in the elderly to loss of independence, poor diet and social isolation.⁴ Importantly as with many disease processes, chronic pain and its subsequent affects upon life is not evenly distributed throughout the population. Females and patients from a lower socioeconomic status have been shown to report more chronic pain.³,⁴

Self-reporting of pain is currently one of the most important ways that patients aid healthcare professionals to evaluate patient pain and construct a treatment plan. However, patients with dementia syndromes often have significant language deficits as well as emotional and behavioural changes making relying upon self-reporting of pain inappropriate. It has been shown that patients with dementia have poor access to effective pain management regimes, as well as palliative care, compared to patients with no cognitive impairment.⁵,⁶ It is clear that in line with current population changes healthcare professionals are going to encounter more patients with chronic pain syndromes and cognitive impairment. This is highlighted by the fact that one in three people over the age of 65 years will die with dementia.⁵ This paper will explore ways in which clinicians can approach and manage chronic pain in patients with cognitive impairment and improve quality of life for such patients.

**Physiology of pain in the elderly**

It is important to be aware that ageing and the pathological processes involved in dementia syndromes affect the way our bodies’ process pain. Firstly, it is well known that as we age our body undergoes significant changes, and the way we perceive pain is no different. For example, work carried out by Chakour et al showed that patients over 65 years presented a higher thermal and mechanical pain threshold when compared to younger controls.⁷ Furthermore, studies have shown that pain tolerance decreases with age.⁸,⁹ Therefore, the current general consensus is that ageing increases pain threshold whilst also reducing the tolerance of pain.⁷,⁹ This reduction in the interval between when pain commences and when the stimuli leads to a withdrawal response in the elderly patient, may be the reason why pain can be challenging to treat in older patients. Daniel Ciampi de Andrade et al point out that this is consistent with anatomical and functional findings, which showed a reduced number of functional thin fibres processing...
nociceptive information in the over 65s, in addition to a reduction in the activity of the endogenous opioid system, a major aspect of the descending modulatory control of pain.\textsuperscript{19}

Secondly, the dementia syndromes damage a number of cerebral structures that directly affect the way patients’ process painful stimuli. A study in 1999 compared the pain tolerance and tolerance thresholds in elderly patients with and without Alzheimer's disease (AD) using electrical stimulation as a model of phasic pain and compression of the subject's arm as a model of tonic pain.\textsuperscript{10} This study amongst others found that there was a significantly higher tolerance threshold in patients with AD and no differences between overall pain detection thresholds.\textsuperscript{10,11} This suggests that the sensory-discriminative aspect of pain would be normal in AD patients whilst there would be abnormalities in affective-emotional components.\textsuperscript{1,11} This is supported by the fact that pathologically AD usually affects the prefrontal cortices and limbic system, related to control of affective-emotional components of pain, and can spare the lateral thalamus and sensory cortices.\textsuperscript{11} Benedetti et al also highlighted an important concept that there would be an increased variation between pain tolerance and tolerance thresholds in more advanced disease as a direct result of significant structural changes.\textsuperscript{10} Using the concept that the degree of structural damage correlates directly to pain processing, the research group also hypothesised that the reason that patients with vascular dementia generally have increased pain complaints when compared to Lewy body dementia and AD is the increased involvement of medial pain system.\textsuperscript{10,11}

### Is the patient experiencing pain?

There are a wide range of validated pain assessment tools that can aid healthcare professionals, carers and families in making decisions about a patient's pain management. The selected assessment tool can vary between NHS regions and certainly varies between countries. It is important for healthcare professionals to become familiar and competent with the locally approved pain assessment tools.

### Self-report

Self-reporting of pain is the gold standard for the diagnosis of pain in patients who maintain the ability to communicate. Information can be gleaned during a medical history or through using one of many pain assessment scales. Pain assessment should include a number of factors that are summarised in Table 2.

Commonly used scales to assess severity of pain in clinical practice include the Functional Pain Scale (FPS), Visual Analogical Scale (VAS) and Present Pain Intensity (PPI). It should be noted that the VAS should be used with slight caution in the elderly, as there is evidence that elderly patients report that VAS is harder to use than verbal descriptor scales.\textsuperscript{12} Indeed, up to

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**Box 1: Important definitions**

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<th>Forms of threshold</th>
<th>Definition</th>
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<tr>
<td>Detection threshold</td>
<td>This is the lowest intensity of stimulus that the patient notices.</td>
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<tr>
<td>Pain threshold</td>
<td>This is the least intensity of stimulus that stimulates a painful response in the patient.</td>
</tr>
<tr>
<td>Tolerance threshold</td>
<td>This is the least intensity of stimulus that stimulates a pain withdrawal response in the patient.</td>
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30% of over 65s without cognitive impairment found the scale difficult to use. Therefore, other verbally based pain rating scales may be more appropriate for particular elderly patients.

**Direct observation tools**
There are currently approximately 750,000 people in the UK with dementia and this will increase to over one million people by 2025. Patients with moderate or severe dementia can reliably report the presence of pain but deficits in higher cerebral functioning may make prompt recognition and treatment of pain difficult. Therefore, direct observational tools have been developed to assess for the presence of pain in patients with advanced dementia.

These tools evaluate a number of aspects of patient behaviour (Box 3). Patient behaviour is monitored over a period of time (>5 minutes) and should include activities of their normal daily living. Despite being less sensitive in the elderly, baseline physiological measurements should also be taken (heart rate, temperature and blood pressure) in addition to observing patient behaviour as this may yield important information. These findings can then be integrated together using a number of tools including Pain Assessment.
in Advanced Dementia (PAINAD) and Observational Pain Behavior Assessment Instrument (OPBAI).

**Caregiver reports**

Caregiver reports have become a very important tool in assessing pain, especially for patients with dementia. This is highlighted by the fact in Scotland 32.3% of people over 65 have high levels of care needs and cared for either at home with family/social care support or in nursing homes.\(^4\)

The Pain Assessment for the Dementing Elderly (PADE) is one example of a caregiver report tool. It was developed to help caregivers assess a patient’s behaviour that may indicate pain. The PADE includes an assessment of physical characteristics (facial expression, posture), pain intensity rating and assessments of activities of daily living. The PADE has been validated to assess pain in the elderly in long term care facilities and is widely used in the UK and USA.\(^5\) Other tools include the Pain Assessment Instrument in Non-Communicative Elderly that has same general categories to the PADE.

**Evaluate the nature of pain syndrome**

In simplistic terms there are four chronic pain syndromes that are important to differentiate due to variation in subsequent management. Importantly, there are not many assessment tools that are designed purely for cognitively impaired patients so the clinician is left with their clinical judgement and tools designed for the elderly in general.

Firstly, the most common syndrome in the general population is pain due to excess of nociceptive inputs.\(^1\) This includes all situations where pain is mediated by excessive activation of an intact somato-sensory pain pathway.\(^1,3\) This chemical over-activation in the ascending spinal tracts is triggered by active illness, or inflammation and/or injury resulting in direct tissue damage. Patients may also have movement associated episodic pain related to specific patient movements. The main issue with such patients is to try and achieve effective prophylactic pain relief if any patient movement is planned. These pain syndromes
Pain can be treated using paracetamol, opioids and non-steroidal anti-inflammatory drugs (NSAIDs). A number of pain guidelines, such as the WHO analgesic ladder, can help to guide prescription.

Secondly, neuropathic pain is an intensively painful syndrome brought about by nerve injury or dysfunction of nerve pathways. Commonly patients will experience spontaneous often un-triggered episodes of burning pain. In addition, there are important sensory phenomenon including allodynia (pain evoked by a stimulus not normally associated with pain) and hyperalgesia (pain response at a higher level than expected, after exposure to a stimuli).

Differentiating between neuropathic and nociceptive pain syndromes has important implications for diagnostic and treatment decisions. For example, diagnosing particular nociceptive pain can be important to pick up an acute condition (eg. angina or Giant cell arthritis). This is particularly relevant in the elderly where there is an increase in atypical presentation of disease. The Leeds Assessment of Neuropathic Signs and Symptoms (LANSS) scale can be used to aid this differentiation by combining patient questionnaire (concerning qualities of the pain) and physical examination. The LANSS has been validated with a high sensitivity and specificity. Unfortunately, there are no specific scales to assess neuropathic pain in the elderly or cognitively impaired elderly populations. Therefore, although patients with mild/moderate dementia may be able to participate in the LANSS or other questionnaire systems (eg-PainDETECT; Neuropathic Pain Diagnostic Questionnaire) due to the “yes” and “no” answers, there will be significant challenges in differentiating pain syndromes in patients with advanced disease.

Thirdly, chronic pain syndrome (or dysfunctional pain syndrome) is a constellation of syndromes that do not respond adequately to medical care. These syndromes include irritable bowel disease, fibromyalgia, globus hystericus and some forms of headache. These syndromes present with no anatomical lesion related to the pain they experience, a complex history and unknown aetiology. However, the patient may suffer significant pain reducing their quality of life. This can be very challenging to assess and treat in patients with dementia in line with the unclear aetiology and poor response to medical therapy. A truly multi-disciplinary (MDT) approach is required in these patients and should include personal carers, the family, GP, physiotherapists and nurses to avoid the revolving door of care. An MDT approach is most likely to succeed as patients require a therapist or self-directed physiotherapy regime, community support in addition to medical therapy.

Finally, in a hospital setting it is common for patients to present with mixed pain syndrome. The classic example is a patient with cancer, as due to the nature of the disease, the patient can experience a number of different forms of pain. Pain can be felt as a result of direct tissue invasion, direct involvement of nerves or treatment side effects. Healthcare professionals need to diagnose all of the causes of pain and treat in a co-ordinated manner to maximise outcome.

Management of pain syndromes

Non-pharmaceutical methods

Despite pharmaceutical regimes being commonly used to treat chronic pain in the elderly there a number of non-pharmaceutical methods that have been shown to be of benefit. Non-drug approaches are important to consider in line with the fact that adverse drugs reactions (ADR) are much higher in the elderly in line with reduced efficiency of elimination and metabolism of drugs. Furthermore, drug interactions are more common because of higher rates of polypharmacy (>5 drugs).
**Box 4: WHO analgesic ladder**

Note: A patient is placed upon a “step” based upon their pain assessment score and any additional information gained from the general assessment of the clinician.

<table>
<thead>
<tr>
<th>Step on the WHO analgesia ladder</th>
<th>General treatment</th>
<th>Specific treatment information</th>
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<tr>
<td><strong>Step 1</strong></td>
<td>Non-opioids/ ± adjuvant drug(s)</td>
<td>Patients would describe mild to moderate pain. Patients can be placed on step one with a pain score between 0–4. Typically this will involve paracetamol (1g qds) and an NSAID, often ibuprofen, unless contraindicated (GI bleeding in history).</td>
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<td><strong>Step 2</strong></td>
<td>Opioids ± non-opioid ± adjuvant drug(s)</td>
<td>Patients would describe moderate pain. Patients can be placed on step two with a pain score between 5–6. Opioids used in step 2 include co-codamol, codeine and dihydrocodeine. This could be complemented with paracetamol (unless on co-codamol) or NSAID (if not contraindicated). Adjuvants can also be used at this stage.</td>
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<tr>
<td><strong>Step 3</strong></td>
<td>Opioids ± non-opioid ± adjuvant</td>
<td>Patients would describe moderate to severe pain. Patients can be placed on step three with a pain score between 7–10. Step 2 opioids should be stopped. Opioids such as morphine, oxycodone (useful in patients who develop side effects on morphine) or buprenorphine started. This could be complemented with paracetamol or NSAID. The method of delivery is important as this can be varied from patient to patient depending upon their specific needs. It should be noted that the above steps are prescribed for background pain and that breakthrough therapy should also be prescribed (1/6th of regular 24 hour opioid dose) for the patient to take as required (PRN). If pain persists or gets worse involve healthcare professionals who are more experienced such as the pain team or palliative care team.</td>
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Firstly, it has been suggested that registered nurses’ knowledge of pain assessment and intervention is insufficient in some centres. An Australian study showed that structured educational programmes aimed at improving pain assessment and management in older people can improve patient care. Therefore, ensuring that a centre’s staff are well equipped with knowledge will aid overall patient care provision. Secondly, a number of studies have shown that the elderly benefit from physical interventions. Studies on elderly patients with chronic lower back pain (CLBP) have shown that physical exercise regimes can aid patient pain symptoms. However, where the underlying problems regarding the cause of pain are more complex, psychological components of pain should be addressed. For example, physiotherapy programmes that address psychological aspects of pain have been able to change patients’ beliefs about their exercise limitations and subsequently reduce the impact of CLBP on their lives.

Pharmaceutical methods

There are significant pharmaceutical options for treating pain. The clinical efficacy of structured pain management has been demonstrated for patients with dementia. To aid healthcare professionals make decisions upon certain agents and dosing there a number of specific guidelines. These are numerous and are published by the British Geriatric Society, British Pain Society and Royal College of General Practitioners to name a few. However, the basis for most of these recommendations are adapted from the 1990 WHO analgesic ladder which was originally developed for pain relief in cancer patients. Table 4 summarises the key principles surrounding prescribing using the WHO analgesic ladder. Guidelines based upon the WHO analgesic ladder have been validated in patients with dementia in care institutions.

This pain ladder provides an excellent tool that can aid decisions made by a doctor in addition to his/her clinical judgement. It is important to stress that there are situations where following this protocol is not best practice. For example, adjuvant drugs such as tricyclic antidepressants and anticonvulsants are used to treat neuropathic pain and benzodiazepines can be used to treat pain associated with muscle spasms. Furthermore, it has already been outlined that the elderly are at much higher risk for ADRs so regular assessment of drug therapy and regular screening for common side effects (including constipation, opioid toxicity and confusion) is regarded as best practice. It should be noted that the method of medication delivery is important as this can be varied from patient to patient depending upon their specific needs and comorbidities. If pain persists, becomes worse, or there a clinical challenges with opioid prescription then it is prudent to involve healthcare professionals who are more experienced in this field, such as the pain team or palliative care team.

Conclusion

Chronic pain is common in the elderly, with and without dementia. Untreated chronic pain affects patients in many aspects of their lives, often reducing patients’ quality of life. In current clinical practice self-reporting of pain is the gold standard for assessing patient pain. This is of course reliant upon intact communication skills. However, dementia is posing major challenges for effective diagnosis and treatment of pain in the elderly in line with deficits in higher cerebral functioning. It has been established that patients with dementia syndromes have the same capacity of pain discrimination as unaffected adults but with a reduced affective experience. To address these challenges a methodical approach to pain assessment is required including observational and caregiver reports using a number of validated pain reporting tools. Current treatment must involve pharmaceutical therapies using guidelines based upon the very well validated WHO analgesic ladder. However, in line with the fact that the elderly have higher incidences of ADRs healthcare professionals must be careful and use clinical judgement to monitor for side effects and complications in addition to using non-pharmaceutical approaches.

Conflict of interest: none declared

References available online at www.gmjournal.co.uk