Palliative Care in the Vegetative State

Emily R. Levy

UVM Palliative Care Rotation
8/26/2010
Vegetative State: What is it?

- Patient with severe anoxic brain injury who progresses to a state of wakefulness without awareness.
- Refers not to “vegetable” but to “vegetate”.
- Criteria\(^2\) include:
  - No evidence of awareness
  - No evidence of sustained, reproducible, purposeful, or voluntary behavioral responses to visual, auditory, tactile, or noxious stimuli
  - No evidence of language comprehension or expression
  - Sleep-wake cycles
  - Bowel and bladder incontinence
  - Variably preserved cranial-nerve and spinal reflexes
Persistent and Permanent Vegetative States

- “Persistent Vegetative state” present one month after acute traumatic or non-traumatic brain damage

- “Permanent vegetative state” denotes irreversibility; 3 months after non-traumatic brain damage and 12 months after traumatic injury
Minimally Conscious State: What is it?

- As with PVS
  - severe alteration in consciousness
  - demonstrate sleep-wake cycles

- In contrast to PVS
  - may demonstrate visual tracking
  - follow simple commands
  - signal yes or no
  - have intelligible verbalization or purposeful behaviors
After a Vegetative state becomes ‘permanent’ by diagnostic criteria, it is extremely unlikely that it will progress to a minimally conscious state.¹
Epidemiology

In the United States, it is estimated that there may be between 15,000-40,000 patients who are in a persistent vegetative state³
Can patients in vegetative states experience pain?

• Critical role of thalamo-cortical interactions for meaningful conscious experience
• Thalamo-cortical connections are drastically altered, and/or destroyed, in vegetative states⁹
Does Consciousness = Experience

• Unproven whether cortical-mediated consciousness is required for sensory (or pain) perception

• Children with hydranencephaly are discriminatively aware, despite total absence of functional cortex\(^5\)
What is Pain?

An unpleasant sensory and emotional experience associated with real or potential tissue damage

- Chronic and Neuropathic pain associated with central sensitization (and psychological states)
- Acute and Nociceptive pain involve Lateral (thalamus, somatosensory cortices) and Medial (thalamus, cingulate cortex, amygdala, hippocampus, hypothalamus) pain systems
- Patients in vegetative states could have triggers of both nociceptive and neuropathic pain
The Medical Profession’s Opinion:

• 2009 survey on >2000 medical professionals: "Do you think that patients in a vegetative state can feel pain?"
• 68% of the interviewed paramedical caregivers (n=538) and 56% of medical doctors (n=1166) "yes" 8
• Non-MD professionals, religious caregivers, and older caregivers more likely to think VS patients experience pain
• Following professional background, religion was the highest predictor of caregivers' opinion
PET Scan Evidence: Pain in Vegetative States

- PET scan to investigate cerebral blood flow after stimulations of median nerve
- Controls: painful stimuli activated a large set of areas involved in pain processing (brainstem, thalamus, somatosensory cortices, insula, superior temporal and anterior cortices)
- VS patients: activated brainstem, thalamus, and primary somatosensory cortex. Failed to activate the secondary somatosensory cortex or the other higher order associative cortices.\(^9\) Residual perception in primary (peripheral) pain pathways.

![PET scan images](image-url)
Should we treat pain in vegetative states?

• Ethically, based Beneficence and Non-maleficence, assuming a patient feels pain is most appropriate way to approach Vegetative States.⁶

• 40% of Minimally Conscious patients are initially misdiagnosed as being in a vegetative state; MCS patients have conscious perception of pain⁶,¹³

• Even in a true Permanent Vegetative State, pain detected by stereotypical responses or flexion withdrawal after noxious stimuli; there may be experience of pain at some level
If a vegetative state patient had pain, how would we know?

• Diaphoresis, tachycardia, tachypnea, and posturing/increased tone, may signal a type of “pain”

• Injuries which cause pain in conscious people should be assumed to cause pain in VS patients

• Multiple Behavioral Scales can assess for Pain Response: The Glasgow Coma Scale, Coma Recovery Scale, and the Coma/Near-Coma Scale
Prophylactic Pain Treatment

• In vegetative states, practice prophylactic pain management based on known injuries and clinical presentation
• Consider pain in VS patients with spasticity, contractures, fractures, pressure sores, soft tissue ischemia, and post-surgical sites
• Consider neuropathic pain in patients with cortical atrophy, peripheral nerve injury, or chronic nerve stimulus
Pharmacologic Choices

- **Mild**: NSAIDs, Aspirin, Acetaminophen
- **Moderate**: Ketorolac, Mixed opiates with acetaminophen, Tramadol
- **Severe**: Morphine, Pentazocine, Nalbuphine, Buphrenorphine,
- **Neuropathatic**: TCA and SNRI antidepressents, anticonvulsants
- **Contractures**: Botox or Baclophen
- **Secretions**: Glycopyrrolate
Comfort Care

- Suctioning, providing tracheostomy care, turning, feedings, cathing or toilet care, bathing, eye moistening, and dressing are routine comfort care requirements by nurses who care for PVS patients.

- Alternative therapies include Eastern Medicine, acupuncture, Reiki, prayer, energy healing, and music.
Within the United states, thousands of patients are in permanent vegetative states today.

Vegetative State patients may detect pain in a variety of ways; however, they are unlikely to experience it via cortical processing.

Ethically, we should prophylactically treat patients in vegetative states.

Medically, we should address both nociceptive and neuropathic pain.

More research is needed to increase our understanding of sensation in vegetative patients and find medical guidelines for pain management.