**The Role of ketamine in modern acute pain management**

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Ketamine was originally synthesized in the 1960’s as an anaesthetic agent and was first given to American Soldiers in the Vietnam War. It is useful in battlefield situations, as it produces anaesthesia without loss of respiratory drive, thereby avoiding the need for ventilation. It also preserves sympathetic reflexes, which helps to maintain blood pressure in patients who may have lost blood [1].

Over fifty years later ketamine is still used as an anaesthetic agent, but in addition it is used in low, subanaesthetic doses for its analgesic properties. Ketamine interacts with a number of receptors and channels and the analgesic effect is due to the antagonism of the N-methyl-D-aspartate (NMDA) receptor [2], which is thought to be responsible for central sensitization, the mechanism by which acute pain becomes persistent or chronic [3,4].

In normal pain transmission, the NMDA receptors in the dorsal horn of the spinal cord are inactive and are plugged by magnesium ions. But when the dorsal horn is bombarded by pain signals and there is intense activity in the synapse, the NMDA receptors become active. This may occur when pain is uncontrolled after surgery, during trauma or when nerves have been injured. Activation of this receptor causes a considerable influx of calcium into the spinal nerve, which causes massive neuronal depolarisation and increases the level of excitability of this nerve [5]. Central sensitization changes the way that the nerves deal with subsequent painful stimuli [6]. Central sensitization shows itself by enlarging the sensitive area of the skin that causes pain stimulation and can also produces the symptoms of allodynia and hyperalgesia [7].

Since 1998 acute pain services have become more aware of the potential for patients to develop chronic pain after surgery [8] and uncontrolled post-operative pain has been identified as a risk factor [7,9]. There have been various systematic reviews supporting the use of ketamine in controlling pain after surgery [10,11,12,13]. These reviews have shown that ketamine reduces pain intensity and opioid consumption.

This presentation will discuss the ways that ketamine can be used for complex surgical pain and will outline the various ways that it can be given. Selection criteria will be discussed along with adverse effects.

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**Other suggested reading:**

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