Sinol-M : Mechanism of action

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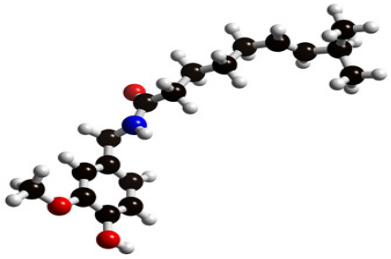
Sinol-M™ nasal spray contains a mixture of natural ingredients among which capsicum (capsaicin) - the extract from chili pepper plant is believed to be the active component that provides relief from allergy, sinus congestion and headache.

Unlike many other all-natural and homeopathic products, the chemical structure of capsicum and its mechanisms of action in animals and humans have been well characterized [1, 2]. The genes encoding their production have also been recently identified [3]. Capsaicin is a member of the vanilloid family and binds to a receptor called the vanilloid receptor subtype 1 (VR1) [4].

The burning and painful sensations associated with capsaicin result from its chemical interaction with sensory neurons. They interact with the VR1 ion channel-type receptors, which then permit cations to pass through the cell membrane and into the cell. The resulting depolarization of the neuron stimulates it to signal the brain. More recently, the VR1 ion channel receptor has been shown to be a member of the “superfamily” of Transient Receptor Potential (TRP) ion channels, and is now referred to as *TRPV1*. There are a number of different TRP ion channels that have been shown to be sensitive to different ranges of temperature and probably are responsible for the human range of temperature sensations. Thus, capsaicin does not actually cause a chemical burn, or indeed any damage to tissue at all; it causes only the sensation of one.



Based on this rationale, capsaicin has been proposed as a means against chronic pain, hence its second indication for Headache Relief. With exposure to capsaicin, neurons are overwhelmed by the ion influx and are unable to report pain for an extended period of time with a blockade of neurogenic inflammation ensuing. If capsaicin is removed, the neurons recover.

[Capsaicin produces pain by selectively activating polymodal nociceptive neurons. Repetitive administrations of capsaicin produces a desensitization and an inactivation of sensory neurons. Several mechanisms are involved, including:

- receptor inactivation
- block of voltage activated calcium channels
- intracellular accumulation of ions leading to osmotic changes
- activation of proteolytic enzyme processes.

Systemic and topical capsaicin produces a reversible anti-nociceptive and anti-inflammatory action after an initial undesirable analgesic effect.

Apart from use in the prevention of pain [5] capsaicin has also been used as a dietary supplement, pest repellant, in cancer treatment [6, 7] and autoimmune diabetes [8]. It is also part of standard procedure of cough threshold measurement.

A prospective clinical study of the nasal application of capsaicin demonstrated significant symptom relief in patients with allergic rhinitis [9]. This is achieved through blockage of the C-fibre conduction, inactivation of neuropeptides released from peripheral nerve endings, and subsequent reduction of neurogenic inflammation. The net result is amelioration of the bothersome nasal symptoms associated with allergic rhinitis. While this effect is achieved by the above cited mechanisms involving local neuronal networks, Sinol-M, the new formulation, strips away some of the discomfort due to the capsaicin itself, allows the patients to feel better after instilling it in the nose, and improves their night sleep by reducing the number of as needed nighttime puffs. This it does by changing the pH, osmolarity, and adding a “coat” of soothing natural polymer.

References

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