



PAIN AND ITS MANAGEMENT: A SYSTEMATIC REVIEW

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ABSTRACT

Pain is an unpleasant signal that something hurts. It is a complex experience that differs greatly from person to person, even between those with similar injuries and/or illnesses. Pain can be very mild, almost unnoticeable, or explosive. **Pain** is a complex experience consisting of a physiological and a psychological response to a noxious stimulus. Pain is a warning mechanism that protects an organism by influencing it to withdraw from harmful stimuli; it is primarily associated with injury or the threat of injury. Pain is the most common reason for physician consultation in most developed countries. It is a major symptom in many medical conditions, and can interfere with a person's quality of life and general functioning. Simple pain medications are useful in 20% to 70% of cases. Psychological factors such as social support, cognitive behavioral therapy, excitement, or distraction can affect pain's intensity or unpleasantness.

Keywords: pain, perception, stimuli, neurotransmitters

INTRODUCTION

Pain is complex, multidimensional experience. Pain is much more than a single sensation caused by specific stimulus. Pain is highly subjective and individualized. For many people it is a major problem that causes suffering and reduces quality of life. A thorough understand of the physiologic and psychosocial dimension of pain is important for effective assessment and management of patient with pain. Pain is an, unpleasant sensory and emotional experience associated with actual or potential tissue damage (**IASP-International Ass. for Study Of Pain 1980**). According to **Katz and Melzack**, pain is a personal and subjective experience that can only be felt by the sufferer. According to **McCaffery** pain is whatever the experiencing person says it is and exists whenever they say it does.

PAIN PHYSIOLOGY

Process of pain physiology

- Nociceptor
- TRANSDUCTION
- TRANSMISSION
- PERCEPTION
- MODULATION

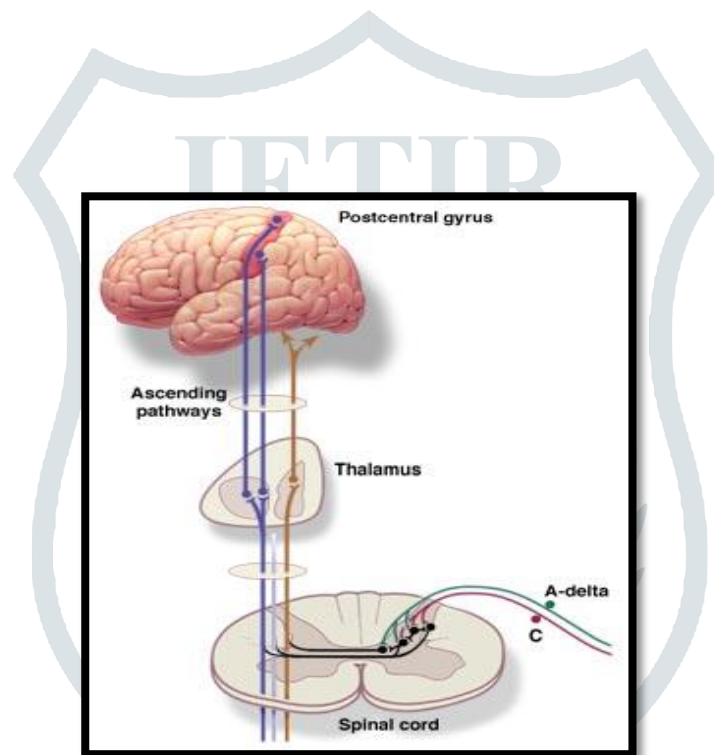


FIGURE NO.1: Showing process of pain physiology

Pain Physiology Transduction

Pain Transduction

- Pain stimuli is converted to electrical energy. This electrical energy is known as Transduction. This stimulus sends an impulse across a peripheral nerve fiber (nociceptor). It refers to conversion of chemical information in the cellular environment to electrical impulses that moves toward spinal cord.
- The phase is initiated by cellular disruption during which affected cells release various chemical mediators (neurotransmitters) such as prostaglandins, bradykinin, serotonin and histamine that react to painful stimuli.

Two type of peripreral nerve fibers conduct painful stimuli: the fast myelinated A-delta fibers and the slow unmyeliated C fibers. e.g- After stepping on nail ,a person initially feels a sharp, localized pain which is a result of **A fibers** transmission. Within few sec. the pain become more diffused and wide spread until the whole foot aches because of **C fibers**.

Neuroregulator:

- Neuroregulator are the substance that affects transmission of nerve fibers, play an important role in the pain experience. These substances are found at the site of nociceptors, at the nerve terminal within dorsal horn of spinal cord. These are of two types i.e. neurotransmitters and neurodilators.

Neurophysiology

NEUROTRANSMITTERS:

- Substance P- transmits pain impulses to brain centers and causes vasodilatation and edema. that send electrical impulse across the synaptic cleft b/w two nerve fibers
- Serotonin- cause's pain by altering sodium flow—neuron to fire. It release from brain stem and dorsal horn to inhibit pain transmission

Pain Transmission

Movement of pain impulses from site of transduction to the brain

- A delta fibers (myelinated) send sharp, localized and distinct sensations.
- C fibers (unmyelinated) relay impulses that are poorly localized, burning and persistent pain.
- Pain stimuli travel- spinothalamic tracts.

Pain Modulation

Modulation:

- Inhibitory neurotransmitters like endogenous opioids work to hinder the pain transmission.
- This inhibition of the pain impulse is known as modulation

- Modulation involves the activation of descending pathway that exert inhibitory or facilitator effects on the transmission of pain. Depending on the type a degree of modulation, nociceptive stimuli may or may not be perceived pain. Modulation of pain signal occurs at the level of the periphery
- Spinal cord, brainstem and cerebral cortex. Descending modulator fibers release chemical such as serotonin, norepinephrine, GABA and endogenous opioids that can inhibit pain transmission. The high degree of processing of the sensory impulses occurs at this level

Pain Perception

Perception:

- Person is aware of pain –somatosensory cortex identifies the location and intensity of pain
- Person unfolds a complex reaction-physiological and behavioral responses is perceived.
- Pain stimuli are transmitted up the spinal cord to the thalamus and midbrain. From the thalamus, fiber transmit the pain message to various areas of brain, including frontal lobe and limbic system. Perception gives awareness and meaning to pain so that a person can then react. The reaction to pain is the psychological and behavioral responses that occur after pain perception.

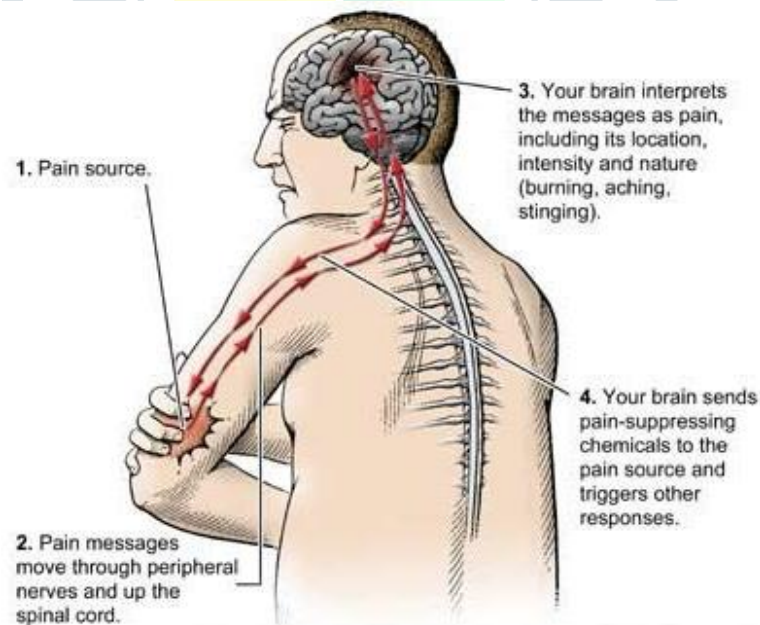


FIGURE NO.2: Showing process of pain perception mechanism

FACTORS INFLUENCING PAIN

- **PHYSIOLOGICAL:** age, gender etc
- **SOCIAL & FAMILY SUPPORT**
- **SPIRITUAL**
- **PSYCHOLOGICAL:** anxiety
- **CULTURAL**
- **PAST EXPERIENCE**

TYPES OF PAIN

Acute pain

This type of pain is generally intense and short-lived. It is how the body alerts a person to an injury or localized tissue damage. Treating the underlying injury usually resolves acute pain.

Acute pain triggers the body's fight-or-flight response, often resulting in faster heartbeats and breathing rates.

There are different types of acute pain:

- **Somatic pain:** A person feels this superficial pain on the skin or the soft tissues just below the skin.
- **Visceral pain:** This pain originates in the internal organs and the linings of cavities in the body.
- **Referred pain:** A person experiences visceral pain at a location other than the source of tissue damage. For example, people often experience shoulder pain during a heart attack

Chronic pain

This type of pain lasts far longer than acute pain, and there is often no cure. Chronic pain can be mild or severe. It can also be continuous, such as in arthritis, or intermittent, as with a migraine episode. Intermittent pain occurs on repeated occasions but stops between flares. The fight-or-flight reactions eventually stop in people with chronic pain, as the sympathetic nervous system that triggers these reactions adapts to the pain stimulus. If enough cases of acute pain occur, they can create a buildup of electrical signals in the central nervous system (CNS) that overstimulate the

nerve fibers. This effect is known as “windup,” which compares the buildup of electrical signals to a wind-up toy. Winding a toy with more intensity leads to the toy running faster for longer. Chronic pain works in the same way, which is why a person may feel pain long after the event that first caused it.

Describing pain

There are other, more specialized ways of describing pain.

These include:

- **Neuropathic pain:** This pain occurs following injury to the peripheral nerves that connect the brain and spinal cord to the rest of the body. It can feel like electric shocks or cause tenderness, numbness, tingling, or discomfort.
- **Phantom pain:** Phantom pain occurs after the amputation of a limb. It refers to painful sensations that feel as though they are coming from the missing limb.
- **Central pain:** This type of pain often occurs due to infarction, abscesses, tumors, degeneration, or bleeding in the brain and spinal cord. Central pain is ongoing, ranging from mild to extremely severe. People with central pain report burning, aching, and pressing sensations.

PAIN ASSESSMENT

- Assessment is essential for proper diagnosis of pain and its management. Ongoing assessment should include subjective and objective assessment that is individual verbal description of pain and observation of person behavior.
- Most components of pain assessment involve direct interview or observation of patient. Diagnostic studies and physical examination finding complete the initial assessment

HARMFUL EFFECT OF UNRELIEVED PAIN

- **PHYSIOLOGICAL RESPONSE** Endocrine/metabolic: weight loss, increase resp. and heart rate, shock, glucose intolerance, hyperglycemia, fluid overload, hypertension, urinary retention and decrease urine output.
- **Cardiovascular:** hypertension, unstable angina and myocardial infarction, deep vein thrombosis
- **Genitourinary & GI:** fluid imbalance, electrolyte disturbance, constipation, anorexia, decrease gastric and bowel motility, decrease urine output.

- Cardiovascular: hypertension, unstable angina and myocardial infarction, deep vein thrombosis.

CONCLUSION:

Pain is a distressing feeling often caused by intense or damaging stimuli. **The International Association for the Study of Pain** defines pain as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage. In medical diagnosis, pain is regarded as a symptom of an underlying condition.

Pain motivates the individual to withdraw from damaging situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future. Most pain resolves once the noxious stimulus is removed and the body has healed, but it may persist despite removal of the stimulus and apparent healing of the body. Sometimes pain arises in the absence of any detectable stimulus, damage or disease.

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