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# Introduction to Pain, Religion and Analgesia

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## 1. Introduction

### 1.1. Early history of pain

Human beings have always pondered and tried to understand why they feel pain and how to reduce it. In the past, pain and disease were thought to be consequences of human wrongdoing. Whether pain is an independent sensation and the product of dedicated neural mechanisms continues to be a topic of debate [1]. The Western concept of pain has evolved with understanding of the world around it and attitudes toward pain have changed and developed in accordance with the science and religious climate of the period [2]. The 19<sup>th</sup> and 20<sup>th</sup> century saw the advent of new anatomical, physiological and biochemical insights and modern pain theories were developed. Modern analgesic drugs were synthesized along with new invasive procedures for pain management strategies. The older traditional beliefs, concepts and attitudes however were not been replaced completely and have survived to some degree in modern patients to this day [3]. The oldest evidence of the 'joy plant' as described in clay tablets by the Sumerians showing the cultivation and use of the opium poppy to bring joy and reduce pain have been found dating back to 5000 B.C. [4] Remains of Neolithic settlements in Switzerland have shown the cultivation of poppy seeds (*Papaver somniferum*) as early as 3200-2600 B.C. [5]. Opium remnants found in Egyptian tombs and other evidence from Thebes shows its use in the 15<sup>th</sup> century B.C. 'Theban opium', an alkaloid centuries later called Thebain was used to relieve pain and the Ebers Papyrus from 1552 B.C., describes how the Goddess Isis would sedate her son Horus with opium as a sedative for children [6]. In 800 B.C. Homer wrote in his epic poem *Odyssey* that a man used opium to soothe his pain and forget his worries [7]. The ancient Greek, Aristotle believed that pain was due to evil spirits that entered the body through an injury seeing pain and pleasure not as sensations but as emotions indicating that the heart was the source of pain rather than the brain. A similar view was shared by Hippocrates who believed that pain was caused by an imbalance in the vital fluids in the body [8]. Persian philosopher, Ibn Sina studied and mentioned relief of pain in his 14 volume book 'The Canon of Medicine' in 1025. The Middle East was well aware of the

beneficial effects of opium and traders introduced it to the Far East. In Europe it was reintroduced by Paracelsus [1493-1541] and in 1680 it had reached England.

In 1664, French philosopher, René Descartes wrote *Traité de l'homme* where he said that the body was more of a machine, and that pain was a disturbance that passed down along nerve fibres until the disturbance reached the brain [9]. This theory changed the perception of pain from a spiritual, mystical experience to a physical, mechanical sensation meaning that a cure for such pain could be found by researching and locating pain fibres within the body rather than a religious view of linking it to the power of God. This also moved the centre of pain sensation and perception from the heart to the brain and changed the idea of pain altogether and paved the way to newer concepts.

## 2. Religious concepts of pain

Treating patients clinically with significant pain can be extremely difficult. Medicine provides incomplete pain relief for many patients and a significant percentage of them remain in moderate to severe pain, and their lives are drastically changed in areas including relationships, work, and leisure. Patients with chronic pain may turn or return to religion and spiritual practices to help them cope with their pain [10, 11]. Studies have found religion/spirituality to be related to higher, lower or unrelated to pain levels and distress [12, 13]. Different religions have various views on pain.

Acceptance is an important concept which has been studied in detail pain literature and also in Hindu traditions. The rich Hindu culture promotes acceptance of pain and suffering as the just working of karma- ones actions in this life or reincarnation as seen in Hinduism and Buddhism. By accepting one's condition, one becomes less attached to changing or altering it. Acceptance of pain and detachment from any struggle with the experience of pain means that painful or pain-free states would be accepted equally. Detachment from this world, in order to be focused on God or The Ultimate, is a primary goal in Hindu traditions [14]. The Sacred Bhagavad Gita, has conversations in the form of songs where Lord Krishna makes references of pain:

*Notions of heat and cold, of pain and pleasure, are born, O son of Kunti, only of the contact of the senses with their objects. They have a beginning and an end. They are impermanent in their nature. Bear them patiently, O descendant of Bharata. (Bhagavad Gita 2.14).*

*That person who is the same in pain and pleasure, whom these cannot disturb, alone is able, O great amongst men [Arjuna], to attain to immortality. [2.15]*

The Gita questions and explains that: What is pleasure for you may be pain for somebody else. What is pain for you may be pleasure for somebody else. Also, what you found pleasurable sometime in the past, you don't enjoy as much now. And what you enjoy now might be something you hated in the past. Pleasure and pain, likes and dislikes, these are just notions of the mind. They appear and disappear. They are impermanent. Even heat and cold are just notions of the mind.

Buddhism explains pain in a deeper perspective by saying that 'Life is a suffering' and that 'Pain and suffering is caused by attachment'. Pain in Buddhism refers not only to physical pain, aging, sickness, and death, and to emotional pain like jealousy, fear, loss and disappointment but also to the existential sense that life is permanently out of joint. Everything is touched by the shadow of dissatisfaction, imperfection, and disappointment. Suffering, in the Buddhist sense, is a pervasive condition. No one escapes it. Even enlightened teachers grow old, suffer the pains of decay, and die. The way out of this pain is following the eightfold path and meditation.

In Islam, the views of pain and suffering resemble those held by its sister faiths, Judaism and Christianity. Pain is either the result of sin, or it is a test meaning that a true Muslim will remain faithful through the trials of life. Pain and suffering also reveals the hidden self to God and is a way so that God may see who is truly righteous by allowing the anguishes and endeavours of life to open up the soul and reveal it to God. God uses pain and suffering to visualise within human beings and test their characters, and correct the unbelievers. According to the Islamic philosophy of life, there is a transcendental dimension to pain and suffering [15].

In Judaism, Just as the Torah describes the pain the women underwent in Egypt, it describes the commensurate joy they felt when they were freed. The Holy Torah describes how after successfully crossing the Red Sea, the Jewish people broke out into song. After recording the song of Moses and the men, the Torah writes:

*"Miriam, the prophetess, Aaron's sister, took a tambourine in her hand, and all the women came out after her with tambourine and with dances" (Exodus 15:20).*

In Sikhism, suffering is an ingredient of life which has spread through the whole of the world. The Holy Guru Granth Sahib tell us: *"Unto whom should I tie up and give the bundle of my pains? The whole world is overflowing with pain and suffering"* and also *"Wherever I look, I see loads of pain and suffering."* So, across the whole of the globe, pain and suffering are a major part of life which all who have to traverse through this human existence will have to endure to a lesser or greater extent.

In Jainism, pain and violence refer primarily to injuring one's own self, a behaviour which inhibits the soul's own ability to attain mokṣa or liberation. At the same time it also means violence to others because it is this tendency to harm others that ultimately harms one's own soul. Furthermore, the Jains have extended the concept of Ahimsa or non-violence, not only to humans but to all animals, plants, micro-organisms and all beings having life or life potential. All life is sacred and everyone has a right to live fearlessly to its maximum potential.

Traditional Christian views on pain and suffering suggest that everything about life has its goal or aim in a mystical reality, the Kingdom of Heaven, for which earthly life is a preparation. While neither illness nor health are seen as ends in themselves, both are viewed as proceeding from the will of God for our benefit and have no ultimate meaning or purpose outside of eternal life [16].

Pain and suffering, although mystic in early Christianity has always been considered a not fully understood side of eternity. However, pain and suffering has been described in several places as truths from God's Word in the Holy Bible:

*Pain and suffering produces intimacy with God (Job 42:5).*

Job, who endured unspeakable suffering, said, "My ears had heard of you but now my eyes have seen you." Intimacy with God is often borne in the furnace of affliction. "During times of suffering, we experience God at a deep, profound level."

*Pain equips us to comfort others [2 Corinthians 1:3-5].*

Suffering gives us compassion for others who are hurting, enabling us to minister more effectively. People who suffer want people who have suffered to tell them there is hope. They are justifiably suspicious of people who appear to have lived lives of ease. Those who have suffered make the most effective comforters.

Suffering and pain refines us.

We can read in Isaiah 48:10 that "...I have refined you, though not as silver; I have tested you in the furnace of affliction."

The meaning of this verse makes it clear that pain and suffering have a way of bringing our strengths and weaknesses to the surface.

*Pain and Suffering produces growth and maturity (James 1:2-4).*

If we turn toward God in our pain, He can use our suffering to mature our faith. We see this biblical truth illustrated through the persecuted church. After hearing their testimonies, few would deny that suffering produces beauty and maturity of spirit.

*Pain and Suffering conforms us into God's image (Romans 8:28-29).*

We may be tempted to read these verses to say that God will bring good out of everything. While He can and does redeem pain in our lives, these verses speak of being conformed to God's image through our suffering.

### **3. Analgesia, the relief from pain**

The modern age has brought along a different concept of pain, quite different to its early historical and religious roots. The definition of 'Pain' is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage [17]. Acute pain is common amongst hospitalised patients particularly following surgery. Postoperative pain, if not treated properly can lead to chronic pain and can be associated with other organ dysfunction as well. There is evidence showing that morbidity and length of hospital stay is clearly affected by the type of pain service available [18]. The importance of post-operative pain management is so high that

higher hospital expenditure can be attributed to it as a result of poor patient satisfaction which may translate into pressure on the health system of the nation [19]. Assessment of quality of pain incorporates measuring many dimensions including physiological endpoints, adverse events and psychosocial status. The increasing interest in evaluating quality of pain reflects the overall increased interest in patient-focused assessments. Unlike the traditional outcomes focusing on morbidity, mortality, quality of recovery from pain assesses other non-traditional outcomes focused around patient-oriented endpoints. By influencing the many domains assessed by quality of recovery, postoperative pain may have a general detrimental effect on quality of recovery [20]. Therefore, postoperative pain and relief affects both medical resource use and patients' ability to resume the normal activities of their lives after discharge from the hospital to home [21]. Even though there is sufficient relief with conventional analgesics, postoperative pain interferes with patients' ability to sleep, walk, and participate in other activities. Medications used postoperatively account for a small portion of total expenditures. Satisfaction scores are not a sufficient indicator of analgesic control. These data can be used to help improve pain relief [22].

### 3.1. Understanding pain

In order to understand *nociception*, it is essential to understand the mechanism behind it and only then is it possible to specifically target the source of the pain stimulus. The several concepts of evaluating and understanding pain are described in the chapters to follow. Here we shall outline the common mediators involved in the mechanism of pain and some of its treatment options.

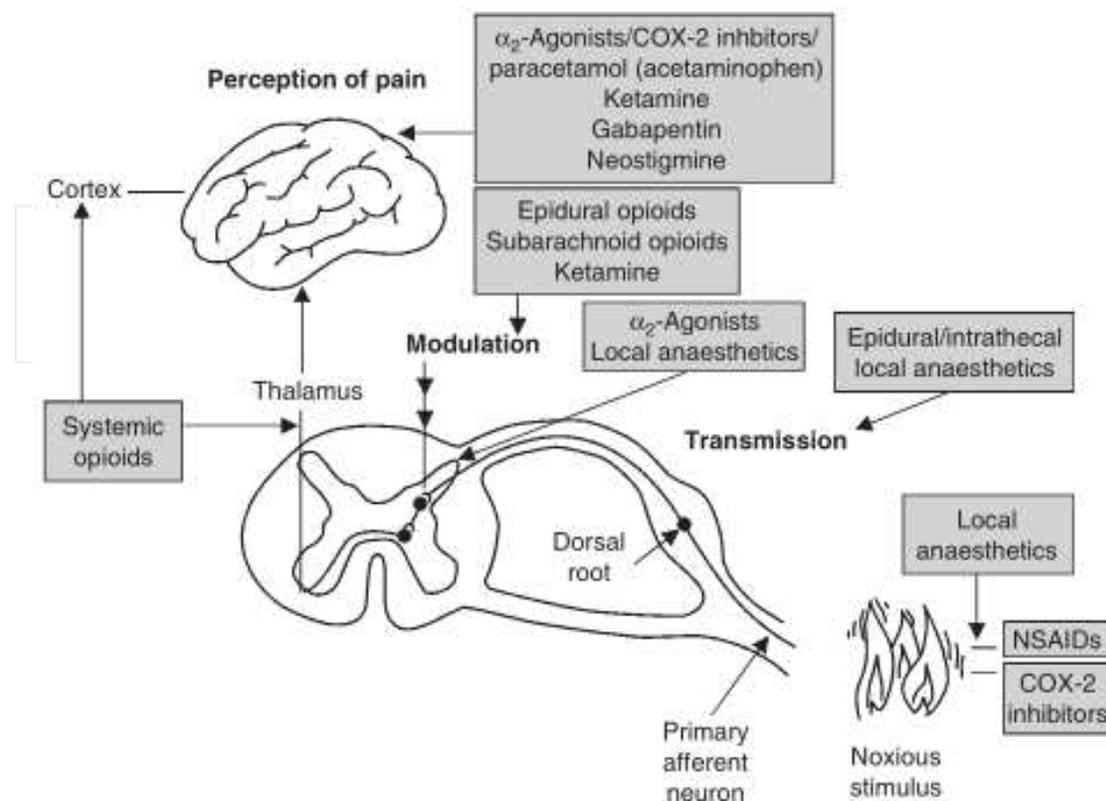
Pain and inflammatory stimuli result in a series of diverse effects as seen in figures 1 and 2, including pain transduction, sensitisation of central nervous system and peripheral nerve endings [23].

Nociceptors or receptors of pain do not have a continuous function under normal activity but when stimulated upon pain stimuli or when tissue irritation or injury occurs respond with a magnitude relevant to the degree of the stimulus [24].

### 3.2. Multimodal pain relief

From a clinical point of view the ideal analgesic would provide pain relief, reduce other analgesic associated side effects and improve overall clinical outcome. This as a result would decrease morbidity, mortality and duration of hospital stay and thus reduction in expenditures.

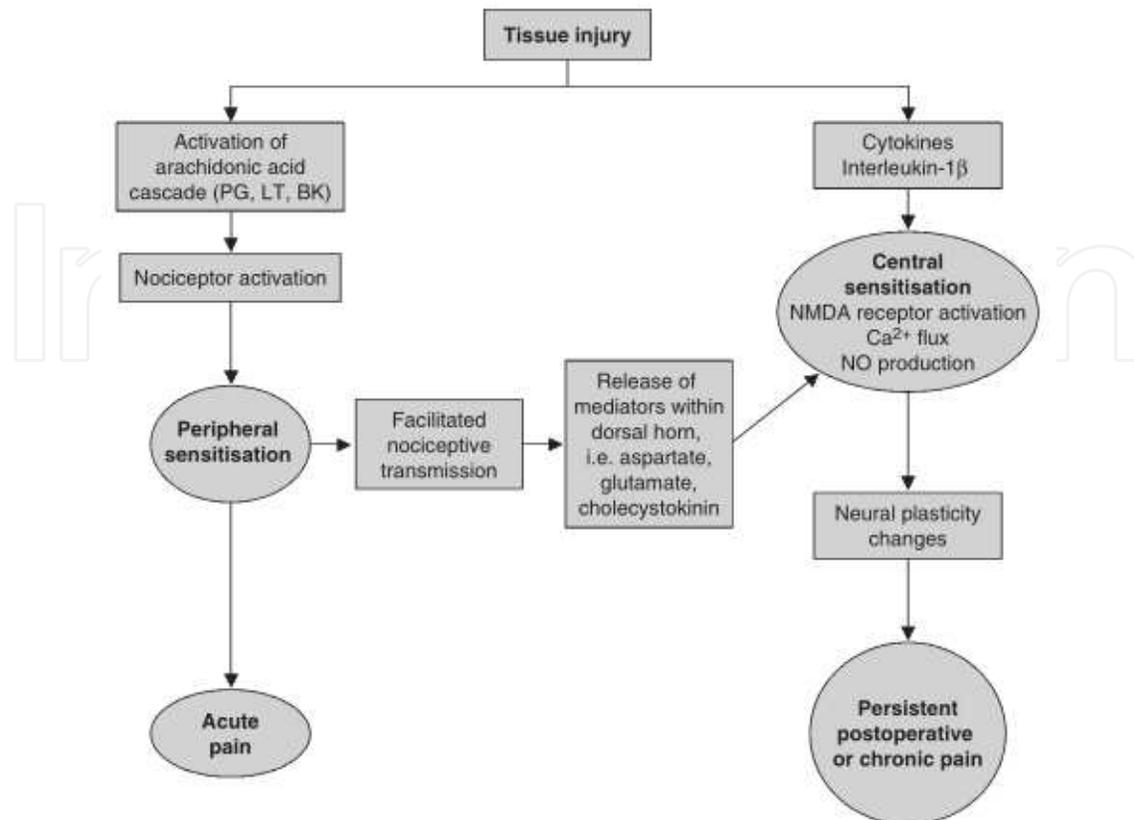
The concept of multimodal analgesia was introduced to combat pain and costs by combining various analgesic techniques [25]. The effectiveness of an analgesic agent can be enhanced by combining effects of various mechanisms to achieve synergistic effects. Paracetamol (acetaminophen) when combined with NSAIDs (non-steroidal anti-inflammatory drugs) provide additive analgesic effect in mild to moderate acute pain [26].



[Taken with permission from Pyati and Gan. Perioperative pain management. CNS drugs 2007; 21: 185-211].

**Figure 1.** Figure 1 shows the pain pathway and various sites of action of analgesics. COX (Cyclo-oxygenase), NSAIDs (Non-steroidal anti-inflammatory drugs).

The synergistic effects of  $\alpha$ -adrenergic and opioid systems has been shown with the effects of clonidine potentiating the effects of morphine [27]. Transcutaneous electrical nerve stimulation (TENS) in an optimal frequency can significantly reduce consumption of analgesics for post-operative pain relief up to 26% compared to placebo [28]. It can even be used to treat phantom pain and stump pain in adult amputees [29]. Epidural analgesia with a combination of local anaesthetics and opioids is an excellent multimodal method for better analgesia and enhanced recovery. Epidural analgesia should not be considered as a single generic entity because many factors like the congruency of catheter insertion location to site of surgical incision, type of analgesic regimen whether local anaesthetic or opioids, and also the type of pain assessment which can be either at rest or dynamical. All these may influence its efficacy. Epidural analgesia, regardless of analgesic agent, location of catheter placement, and type and time of pain assessment, provided better postoperative analgesia compared with parenteral opioids [30]. Continuous perineural techniques have been known to offer the benefits of prolonged pain relief reducing the need for opioids and thus reducing side effects. Studies have shown the positive effects of continuous peripheral nerve blocks over PCA (patient controlled analgesia) with morphine or PCEA (patient controlled epidural analgesia) [31]. Pain relief can be attained by the conventional pharmacological option of administering opioids like morphine or fentanyl. Morphine and Fentanyl have



**Figure 2.** Figure 2 shows the sensitisation of the central nervous system and peripheral nerves. BK (bradykinins), LT (leukotrienes), NO (nitric oxide), PG (prostaglandins). [Taken with permission from Pyati and Gan. *Perioperative pain management. CNS drugs 2007; 21: 185-211*].

been the analgesic drugs of choice for anaesthesia for decades. Transdermal Fentanyl provides a non-invasive opioid pain delivery system for acute pain management. The adverse effects of such opioids are quite common and patients frequently have nausea, vomiting, pyrexia, pruritis and hypotension. Paracetamol is very effective for mild to moderate pain and given along with opioids reduces their requirements by up to 30%. Paracetamol is now regularly used i.v. intraoperatively or for post-operative pain relief. It is found to be particularly useful in paediatrics. Sodium salicylate, discovered in 1763, was the first of the NSAIDs which have been the cornerstone in acute pain relief with their opioid sparing effects. There are now over 20 different NSAIDs, from six major classes determined by their chemical structures, available. Ketorolac is particularly useful in short term management of moderate to severe pain. But as with other non-selective NSAIDs, Ketorolac may trigger allergic or hypersensitivity reactions. Careful patient selection is essential if use of Ketorolac is considered. Contraindications to its use include a history of, or current risk of, gastrointestinal bleeding, risk of renal failure, compromised haemostasis, and hypersensitivity to aspirin (acetylsalicylic acid) or other NSAIDs, labour, delivery and nursing. These can be attributed to cyclo-oxygenase (COX-1) inhibition [32]. Selective inhibition by COX-2 inhibitors like Parecoxib are significantly better and very useful in gynaecological procedures where it can be administered intraoperatively and immediately

post-operatively before oral analgesics are tolerated. Ketamine enhances pain relief particularly post-operatively. It acts as an antagonist at the NMDA receptor and can be associated with pathological pain states like hyperalgesia and allodynia. Tramadol acts as a  $\mu$ -opioid receptor agonist and works through a modulation of serotonin and norepinephrine. Unlike other opioids Tramadol lacks respiratory depressant effects and carries a lower risk for bowel dysfunction. Pain relief by epidural and spinal anaesthesia or combined spinal-epidural anaesthesia have found major success in obstetric procedures because of the major advantage over general anaesthesia and thus the parturient can stay awake during a caesarean section. They are very useful in covering intra and post-operative pain for lower limb, abdominal and thoracic surgery. Although not shown to decrease pain score greatly or need for rescue analgesia, infiltration of the wound with local anaesthetics by the surgeon following a surgical procedure can help for immediate temporary pain relief. A similar technique with conflicting reports is intra-articular injection of analgesics especially following arthroscopic procedures. A systematic review revealed that intra-articular injections provide moderate pain relief for a short duration [33].

A more definite method of post-operative pain relief are peripheral nerve blocks. With the availability of direct visualisation by ultrasound, nerve blocks are becoming very popular for their precision and accuracy for pain relief. Continuous infusion of local anaesthetic agents through catheters provide adequate post-operative pain relief in both hospital and ambulatory settings reducing hospital stay and post-operative complications significantly. As novel analgesic therapies using Gabapentin, naloxone and nalbuphine make their way into therapy of neuropathic pain, newer non-pharmacological techniques like acupuncture, yoga, relaxation techniques, music therapy and hypnosis are becoming very popular.

Adequate multimodal pain relief requires knowledge and understanding of pain pathways and correct application of a combination of various techniques can be very beneficial to the patient, the institution and as a result for the state.

## Author details

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