

Chronic pain after surgery

Iain Jones

Francoise Bari

Abstract

Chronic pain after surgery is an area of considerable interest. Sufferers of chronic pain experience a poor quality of life, and the economic costs of treatment of the condition and resulting disability are high. Factors such as severe preoperative pain, psychosocial factors and particular surgical procedures have been identified as risk factors. Neuropathic mechanisms are involved in the pathophysiology of chronic post surgical pain and our understanding of this continues to grow. Much interest has focused on perioperative analgesic interventions to reduce the incidence and severity; however, as yet the evidence is neither compelling nor consistent. At present there remains a need for education of the medical profession and the public of the risks of chronic post surgical pain, so that unnecessary or inappropriate operations are minimized.

Keywords Chronic; pain; prevention; risk factors; surgery

Introduction

Definition of pain

Pain is defined by the International Association for the Study of Pain (IASP) as an unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of tissue damage.

There has been a lack of an accepted definition for chronic post surgical pain (CPSP) which has been a barrier in interpreting the literature and is a major reason for the wide variation in the published incidence of chronic post surgical pain. However, it has been suggested that chronic post surgical pain should be defined as:

- pain should have developed after a surgical procedure
- pain should be of at least 2 months duration
- other causes should have been excluded, for example continuing infection, continuing malignancy (after cancer surgery) or chronic infection
- the possibility that pain is continuing from a pre-existing problem.¹

Incidence

The incidence of CPSP varies between procedures and between studies. Table 1 shows the approximate incidence after common procedures. There is some variance between studies which may be attributed to differences in trial design and also the likelihood

Iain Jones MB ChB FRCA FFPMRCA is a Consultant in Anaesthesia and Pain Management at the Royal Victoria Infirmary, Newcastle upon Tyne, UK. Conflicts of interest: none.

Francoise Bari BSc(Hons) MSc MB ChB(Hons) FRCA is a Consultant in Anaesthesia and at the Royal Victoria Infirmary, Newcastle upon Tyne, UK. Conflicts of interest: none.

The incidence of CPSP after common procedures¹

Type of operation	Incidence of chronic pain
Mastectomy	20–50%
Caesarean section	6%
Amputation	50–85%
Cardiac surgery	30–55%
Hernia repair	5–35%
Cholecystectomy	5–50%
Hip replacement	12%
Thoracotomy	5–65%

Table 1

that there are numerous factors affecting the incidence of persistent post surgical pain. There is no doubt that chronic post surgical pain is a significant problem worthy of attention. An estimate based on data available up to 2006 showed that the incidence of chronic pain after surgery was 10–50% and this was severe in 2–10% of patients. Chronic pain is known to severely affect quality of life and has significant economic consequences. It has been estimated that even when using the lowest quoted figures there may be 41,000 new cases each year in the UK alone.¹

Pathophysiology

The mechanisms of CPSP are complex and different mechanisms will be responsible for different pain syndromes even after the same operation.

Tissue trauma, which is the inevitable consequence of surgery, results in inflammatory and immune reactions within tissues. This results in the release of neurotransmitters that act locally and in the spinal cord to produce hypersensitivity and ectopic neural activity, which contributes to central sensitization. Central sensitization occurs when repetitive nociceptive stimuli result in altered dorsal horn activity and amplification of sensory flow. These changes can lead to spontaneous and evoked symptoms associated with neuropathic pain; for example allodynia and hyperalgesia.

Nerve injury during surgery has been implicated in the development of CPSP, and whilst trauma to nerves is an important cause of persistent pain following surgery there is no simple relationship between nerve damage and chronic pain. For example, pain after thoracotomy is well recognized. Intra-operative damage to intercostal nerves is also well recognized, therefore this intercostal nerves damage had been postulated as a causative factor. However, studies have not demonstrated an association between intercostal nerve damage assessed at the time of thoracotomy by nerve conduction studies and the development of pain 3 months later.²

Similarly, although damage to the intercostobrachial nerve has been implicated in the development of persistent pain following mastectomy, many patients with objective signs of nerve injury such as numbness do not develop chronic pain.³

It appears that merely avoiding the sectioning of major nerve trunks is not sufficient to prevent CPSP and sectioning nerves does not always result in chronic pain. It is not possible to perform operations without injuring elements of the nervous

system at some level. A number of questions still exist as to what level of nerve injury is required to induce the changes that result in neuropathic pain. For example, can damage to tissues other than nerves cause neuropathic pain? And, what are the relative contributions of central and peripheral changes in the nervous system to the development of persistent pain following surgery?

Risk factors (Box 1)

Risk factors can be broadly grouped into patient factors and medical factors.

Age

In breast and hernia repair, increasing age seems to reduce the risk of chronic pain. A review revealed that chronic pain after breast surgery was more likely in younger patients but the disease in this group was more severe and invasive which may account for some of the difference in incidence of chronic pain with age. The probability of developing chronic pain after breast cancer surgery was found to reduce by 5% with each year of increasing age.¹

Psychosocial factors

It is well recognized that psychosocial factors play a significant role in the development and maintenance of chronic pain and also the disability associated with it. Indeed psychological approaches such as cognitive behavioural therapy have been used widely in the management of chronic pain.

Psychological factors have been found to correlate with poor outcome following spinal surgery. A 2011 review of this topic identified an association between poor outcome with preoperative pain sensitivity, depression, anger, anxiety and poor pain coping strategies.⁴

Further studies have identified factors such as anxiety, depression, sleep disturbance and catastrophizing (having exaggerated negative beliefs and responses) to be important contributors to the development of persistent post surgical pain. When measured prospectively these predict the trajectory of acute pain or analgesic consumption after breast cancer surgery and in other settings also predict the development of chronic orofacial pain and widespread pain. Catastrophizing has been shown to be strongly related to enhanced pain sensitivity in both healthy adults and patients with chronic pain. Several studies of women undergoing breast surgery have identified an association between catastrophizing and persistent post surgical pain.⁵

Factors associated with increased likelihood of chronic postoperative pain

- Severity of preoperative pain
- Nerve injury
- Psychosocial factors
- Severity of immediate postoperative pain
- Specific surgical procedures, e.g. mastectomy, thoracotomy, amputation
- Extent of surgery

Box 1

Whilst it is acknowledged that psychosocial factors play an important role in the genesis of persistent postoperative pain, more work is required to elucidate their precise nature and influence and how to negate them.

Genetic factors

It is also likely that genetic and epigenetic factors influence both the sensitivity of individuals to analgesic and their risk of CPSP. For example, different haplotypes of the gene for the enzyme catecholamine-O-methyltransferase (COMT) involved in the modulation of pain responses were associated not only with difference in experimental pain sensitivity but also with the development of chronic temporomandibular joint disorder.⁶ Variations have been found in the response to endogenous and therapeutic opioids which have been linked to variations of the mu-opioid and catecholamine-O-methyltransferase. There is also work from experimental studies on mice that show genetic factors influence whether mice develop neuropathic pain following nerve injury.¹

Furthermore, it is suspected that there are certain conditions which may be markers for developing chronic pain after an injury. These conditions include fibromyalgia, migraine and irritable bowel syndrome.

In a study of women with pain after hysterectomy those with pain problems elsewhere than in the pelvis before surgery had an increased risk of chronic post surgical pain. The most common areas were the head, neck, shoulders and low back, which is similar to the areas frequently associated with pain in fibromyalgia.¹ This suggests there may be an underlying vulnerability to developing persistent pain for which there may be a genetic basis.

Preoperative pain

The severity of preoperative pain has been shown in many studies to correlate with the development of persistent post surgical pain. This was first noted in the observations of patients developing phantom pain after amputation, and associations have also been reported with other common procedures such as hernia repair and thoracotomy. Interestingly pain after hip arthroplasty has not been found to correlate with pain afterwards.⁴

Acute postoperative pain

Many studies have shown a correlation between the severity of acute postoperative pain and the development of persistent pain. This has been identified as a risk factor for pain following hernia surgery, breast cancer surgery, total hip replacement and Caesarean section.¹

Surgical factors

The size of operation does not show a simple correlation with CPSP. The type of operation (e.g. breast surgery, hernia repair and thoracotomy) and how it is performed influences the incidence of CPSP. Studies have found more chronic pain and poorer outcomes in general for operations lasting more than 3 hours. This may reflect serious pathology, complications or other health problems affecting complexity of the operation and outcome.⁷

In the case of chronic pain following mastectomy, surgical factors including more extensive surgery (total versus partial

Download English Version:

<https://daneshyari.com/en/article/5684781>

Download Persian Version:

<https://daneshyari.com/article/5684781>

[Daneshyari.com](https://daneshyari.com)