

CHRONIC PELVIC PAIN

Are stimuli from damaged tissue, or maladaptive changes to the nerve supply, responsible for chronic pain syndromes? The answer may alter treatment.

A common thread ties together the studies and developments highlighted here: the notion that maladaptive changes in the neurologic supply to pelvic organs may contribute to chronic pain to a greater extent than do stimuli from damaged tissue. This understanding is consistent with the general lack of any obvious relationship between the degree (i.e., volume) of tissue change in disease (e.g., endometriosis) and the intensity of associated pain. It may also open new avenues to the prevention and treatment of chronic pain.

In the future, treatments for painful conditions seen in gynecology are likely to expand beyond nonsteroidal analgesics and narcotics to include

- neuromodulatory drugs
- local anesthetics applied in novel ways
- nerve-stimulation procedures that are less invasive than methods used so far.

Furthermore, the art of treatment will involve an understanding of the most effective ways to mix and sequence these methods.

Preoperative preemptive analgesia may reduce long-term incisional pain

Mathiesen O, Moiniche S, Dahl JB. Gabapentin and postoperative pain: a qualitative and quantitative systematic review, with focus on procedure. *BMC Anesthesiol.* 2007;7:6.

Fassoulaki A, Stamatakis E, Petropoulos G, Sifaka I, Hasiakos D, Sarantopoulos C. Gabapentin attenuates late but not acute pain after abdominal hysterectomy. *Eur J Anaesthesiol.* 2006;23:136-141.

The study of preemptive analgesia over the past 20 or more years has focused almost exclusively on one goal: reducing immediate postoperative pain, usually

with narcotic consumption as the primary outcome measure. Results have been mixed, with few studies showing clear and clinically meaningful benefit.

More recently, several studies have focused on what may be a more important longer-term clinical outcome measure: incisional pain long after surgery. Multiple studies document an incidence of 10% to 25% of patients reporting incisional pain long after their surgery.¹ Thoracotomy, reconstructive breast procedures, and abdominal incisions have all been associated with this problem. The study by Fassou-

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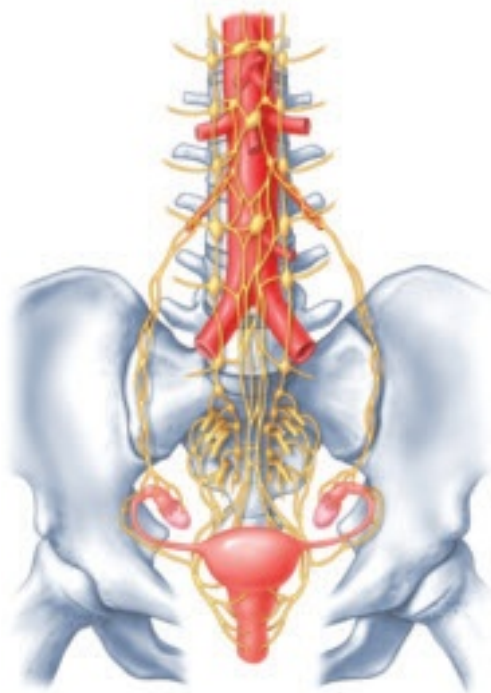
IN THIS ARTICLE

I Implications of preemptive analgesia in patients with chronic pain
Page 58

I Mapping neural pathways in chronic pain
Page 58

I Posterior tibial nerve stimulation OK'd for irritable bladder
Page 60

Chronic pain may alter spinal cord neurophysiology



Under physiologic conditions, the nerves of the central nervous system guide the uterus and other organs through their respective functions. In some women, however, spinal cord neuronal circuitry becomes distorted, eliciting a pain response even when no trigger is present.

FAST TRACK

Full understanding of pelvic pain may come from studying changes in neurologic systems, not in gyn end organs themselves

laki and associates shows that one dose of gabapentin before abdominal hysterectomy was associated with less incisional pain a full month after surgery.

Implications for patients in chronic pain

Patients who suffer chronic pain and who undergo surgery require a higher dosage

In chronic pain, changes in innervation may extend to peripheral organs

Atwal G, du Plessis D, Armstrong G, Slade R, Quinn M. Uterine innervation after hysterectomy for chronic pelvic pain with, and without, endometriosis. *Am J Obstet Gynecol.* 2005;193:1650–1655.

One widely accepted hypothesis is that chronic pain states are accompanied by

of narcotic analgesics during postoperative care than other patients might. This need is usually attributed to accelerated metabolism of the drugs, brought about by longstanding use before surgery. An alternative hypothesis that would unite these observations is that pain pathways in the central nervous system are activated when surgical trauma is inflicted and that they affect the intensity of pain after surgery. For example, if the spinal cord segments associated with the pelvic reproductive organs have been involved in conducting nociceptive (pain) signals for the months or years leading to surgery, superimposed stimulus of surgery may be less well tolerated.

This hypothesis gives rise to several tantalizing questions:

- Would preoperative medication with drugs used to treat neuropathic pain reduce both visceral and somatic components of postoperative pain?
- Would these medications, given early in the clinical course, help prevent the chronic pain associated with pelvic infection and endometriosis?
- Would this approach be an avenue to reduce long-term postoperative pain in women with chronic pain before surgery?

Observations from research into pre-emptive analgesia are providing the impetus for what promises to be a productive and exciting area of clinical research in the treatment of pain in a variety of clinical situations in gynecology.

changes in spinal cord neurophysiology at both neurochemical and neuroanatomic levels. Indeed, in animal models of chronic pain, neuronal connections are altered in the spinal cord such that touch and pressure excite true central pain fibers. New evidence suggests that

changes in innervation associated with chronic pain may also affect peripheral organs (FIGURE).

For example, in the study by Atwal and associates, the uterus of women undergoing hysterectomy was stained for unmyelinated nerve fibers of the type commonly involved in visceral pain signals. Women undergoing surgery for painless conditions had a low density of pain fibers in the lower uterine segment compared with women who had chronic pain before surgery, who had a higher density of pain fibers. This was true for women who had otherwise normal pelvic anatomy, as well as for those who had endometriosis. These findings may explain the puzzling observation

that hysterectomy relieves central pelvic pain in 78% of women undergoing the procedure (and improves pain in 22% of women with persistent pain) even when the uterus is histologically normal on routine pathologic examination.²

Perhaps even more intriguing is the notion that pelvic pain may ultimately be elucidated through the study of changes in neurologic systems rather than changes in gynecologic end organs themselves. If pain, initially triggered by alterations in end organs, becomes chronic and intractable by virtue of neurologic changes, this perspective may lead to entirely new approaches to preventing chronic pain.

Less invasive nerve-stimulation method holds promise for pelvic pain

Nerve stimulation in a wide variety of forms has long been used to block nociceptive signals. Examples include sacral nerve root stimulators, spinal cord implants, and transcutaneous electrical nerve stimulation (TENS) units. Their efficacy varies across pain syndromes, and the duration of impact (even in successfully treated women) is uncertain. The invasive nature of the implanted devices adds to the risk and often relegates them to the bottom of the list of treatment options.

Another method of peripheral nerve stimulation—posterior tibial nerve stimulation—was recently approved by the Food and Drug Administration for treatment of bladder irritability, and may also improve urge incontinence and pelvic pain.^{3,4} It involves application of electrical stimuli to a very fine (acupuncture-like) needle placed next to the posterior tibial nerve, just posterior to the medial malleolus. The nerve is generally stimulated for 30 minutes a week for a series of 12 treatments. Other protocols are

bound to emerge as this method is applied more broadly.

In the case of irritability, bladder pain is also often relieved. The treatment is now being tried in women with interstitial cystitis. Even though the nerve supplies of the various pelvic and vulvar organs do not all arise from the same spinal cord segments, communications within the cord may explain the broader impact of techniques like posterior tibial nerve stimulation. ■

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FAST TRACK

Posterior tibial nerve stimulation has FDA OK to treat bladder irritability and other conditions