Pain-relief regimen treats trauma patients with fewer opioid drugs

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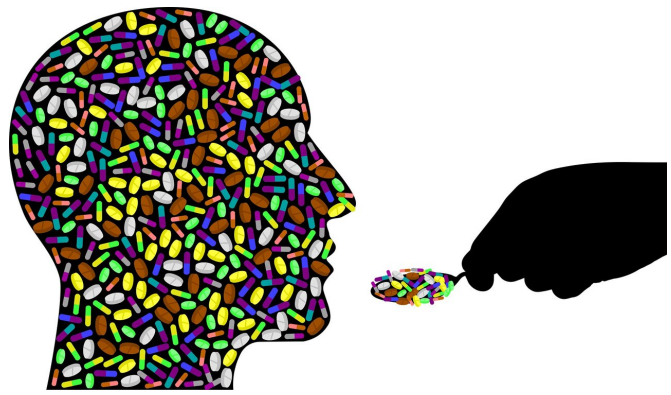

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A multimodal pain regimen (MMPR) designed to minimize opioid exposure and relieve acute pain associated with traumatic injury kept patient self-reported pain scores low while also reducing the daily and total amount of opioid drugs given to trauma patients. Results from the first study of its kind to evaluate an MMPR in a rigorous, randomized controlled trial are published online as an "article in press" by the *Journal of the American College of Surgeons* in advance of print.

"Opioids should not be considered the pillar of treatment for acute pain after injury," said lead study author John A. Harvin, MD, FACS, an associate professor for the department of surgery, McGovern Medical School, The University of Texas Health Science Center at Houston (UTHealth) and trauma surgeon at the Red Duke Trauma Institute at Memorial Hermann-Texas Medical Center.

Trauma patients are at particularly high risk for developing an opioid drug disorder. These patients often have injuries that affect several parts of the body and require multiple surgical procedures resulting in acute pain that cannot be managed by local or regional anesthesia. About 15 percent of trauma patients are at high risk for persistent opioid use as they are more likely than the general population to have a history of substance abuse.

Multimodal pain regimens are increasingly being used to reduce opioid exposure, control acute pain, and enhance recovery after surgery. The trauma team at the Red Duke Trauma Institute and UTHealth developed an MMPR for trauma in 2013. The regimen decreased opioid exposure by 31 percent as well as patients' pain score ratings. However, it involved the use of high-cost drugs not widely available in the hospital, such as intravenous acetaminophen, and drugs at discharge that were not covered by insurers. The regimen also included the medication tramadol that was considered at the time to be a weak opioid but is now considered to be a narcotic-like drug.

In 2018, the trauma team evaluated the Multimodal Analgesic Strategies in Trauma (MAST) MMPR, which only provides opioids for breakthrough pain. MAST MMPR includes four classes of medications: acetaminophen, nonsteroidal anti-inflammatory agents—ketorolac and naproxen—local lidocaine anesthetic patches, and gabapentin.

This pragmatic study compared the effectiveness of the original MMPR with the MAST MMPR, both of which could be escalated or de-escalated by providers. The study included all trauma patients who were admitted over the course of a year to the Red Duke Trauma Institute, a teaching hospital for McGovern Medical School. Patients were randomized in the emergency department to be placed on either the original MMPR or the MAST MMPR.

A total of 1,561 patients across all levels of injury were included in the study. Nearly half of patients in both groups had rib fractures, 20 percent had a traumatic brain injury, and 32 percent had long bone fractures. Twelve percent of patients in both

groups underwent laparotomy (surgical opening of the abdomen), 4 percent underwent thoracotomy (surgical opening of the chest), and 1-2 percent underwent amputation of a limb.

Patients who received the generic MAST MMPR had less overall exposure to an opioid than patients in the other group. Per day, patients in the MAST MMPR received 14 fewer oral morphine milligram equivalents (MME): MAST MMPR patients had 34 MME per day versus 48 MME per day for the MMPR group. This amount is roughly equivalent to 10 milligram of oxycodone per day during hospitalization. Fewer patients in the MAST MMPR were discharged with a prescription for an opioid—62 percent versus 67 percent.

Pain scores were the same in both groups of patients: The median Numeric Rating Scale for pain was 3.3 for MAST MMPR and MMPR patients.

Although this study was intended to answer a local question about MMPRs developed by at the Red Duke Trauma Institute and UTHealth, its findings have broad implications. "We used a generic pain regimen that is affordable at discharge. The discharge medications acetaminophen and naproxen can be bought over the counter. The only drug that requires a prescription is gabapentin and an as-needed opioid, if prescribed," Dr. Harvin explained.

This regimen may be adopted by any trauma center, although implementing it will take time. "The MAST MMPR is a regimen that can be duplicated in any trauma center. However, first the culture of an institution needs to change. Implementation requires education, auditing feedback about responsible opioid prescribing, physician and nursing champions to lead efforts to change clinical practice, and managing the expectations of how to treat pain with other, non-opioid adjuncts," he added.

The MAST MMPR is now standard practice at the Red Duke Trauma Institute and UTHealth physicians. The regimen is being adapted for the treatment of acute burn pain and additional interventions are being studied to better control acute pain and reduce opioid exposure in the first 72 hours of hospital admission.

"Post-traumatic pain, even in the most severely injured patient, can be effectively treated in an opioid-minimizing manner," Dr. Harvin concluded.

More information: John A. Harvin et al. Multimodal Analgesic Strategies for Trauma: A Pragmatic Randomized Clinical Trial, *Journal of the American College of Surgeons* (2021). DOI: 10.1016/j.jamcollsurg.2020.12.014

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