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COVID-19 a 'Game Changer' for Pediatric Anesthesia

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The COVID-19 pandemic continues to impact society and our medical specialty in unpredictable and unprecedented ways (asamonitor.pub/3dIDImf). Although infants and children are at highest risk of respiratory morbidity with viral pathogens, initial presentations of pediatric COVID-19 appears to be less prevalent and severe than in the elderly (*Pediatrics* 2020; *JAMA Pediatr* 2020).

However, the evolving nature of this pandemic has linked a severe manifestation of this disease that presents with persistent fevers and features of toxic shock syndrome or Kawasaki disease. Pediatric multisystem inflammatory syndrome was

initially characterized in a series from London, U.K. (*Lancet* 2020). Given the evolving challenges of the COVID-19 crisis on pediatric perioperative medicine, the pediatric anesthesia community has responded to this call to duty.

Response to the Crisis

The declaration of the National Emergency on COVID-19 outbreak prompted the American College of Surgeons (ACS) to issue guidance on a "plan to minimize, postpone, or cancel electively scheduled operations, endoscopies, or other invasive procedures" (American College of Surgeons 2020). The Children's Hospital

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NSAIDs in Pain Management: New Clinical Avenues to Explore

Catlin Nalley

The use of nonsteroidal anti-inflammatory drugs (NSAIDs) in pain management is not a new concept, and with a number of over-the-counter options, these agents are a common choice among patients. Given the ongoing opioid crisis and the prioritization of enhanced recovery, there has been a renewed interest in these medications.

"NSAIDs have been used for a long time in pain management," noted Tina



Doshi, MD, MHS, Assistant Professor of Anesthesiology and Critical Care Medicine, Johns Hopkins Medicine.

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Built to Last: ASA Monitor Redesigned to Meet New Challenges, Opportunities

Paul Pomerantz

ASA Chief Executive Officer

I had intended to greet the new ASA Monitor with a column to celebrate this transformed publication.

COVID-19 has changed everything.

Now I mostly want to express the immense appreciation for you and pride I have in your specialty. ASA's members were and are at the forefront of this crisis. You responded at tremendous risk to your own safety, but without hesitation, to the needs of your communities and hotspots throughout the nation. Our members were strongly engaged in leading our nation's response, from Jerome Adams as U.S. Surgeon General, to hospital and practice executives, to academic department chairs, to scientists and innovators, and the two-thirds of you who reported taking an active role in providing critical care.



ASA President Dr. Mary Dale Peterson and the ASA Executive Committee have provided dynamic leadership, helping to direct our attention and resources on the most critical matters.

At the outset, Dr. Peterson was invited to a call with the White House Coronavirus Task Force with other medical society leaders. During the call, she quickly established the specialty as a resource for critical care. Our efforts to meet the nation's needs were noticed at the March 26 task force briefing, where Vice President Mike Pence said:

"Thank you to the American Society of Anesthesiologists and Dr. Mary

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NSAIDs in Pain Management

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“They are step one in managing chronic pain, in part, because of the number of available NSAIDs, including over-the-counter drugs.

“Unlike other pain medications, they do not typically cause problems with the central nervous system and have very little, if any, psychotropic effect,” she continued. “With growing awareness of the risks associated with chronic opioid use, NSAIDs have become an attractive option.”

Understanding the Pros, Cons

Beyond serving as an alternative to opioids, NSAIDs have a variety of other merits, including their fast-acting nature. “NSAIDs can act relatively quickly. They are not like other medications that can take several weeks to have an impact,” explained Dr. Doshi. “Therefore, NSAIDs are good ‘as-needed’ agents that don’t need to be taken long-term to see a benefit.”

Patients all have unique needs and NSAIDs, which come in multiple formulations (i.e., liquid, topical gel, and patch), can be tailored to fit individual cases. “We often run into challenges when patients can’t take oral capsules or can’t handle any medications through the GI system,” noted Dr. Doshi. “With several different routes of administration, we can find the best approach for our patients.”

As with any medication, there are potential side effects that must be taken into consideration. “With NSAIDs, the main concerns include excessive bleeding and renal insufficiency, as well as an increased risk of gastric bleeding and gastric ulcers,” noted Dr. Doshi.

Celecoxib, a COX-2 selective NSAID, has a decreased risk of GI disturbance, but a potentially increased risk for cardiovascular events. Therefore, when prescribing this NSAID, clinicians must be cognizant of patients who have a history of cardiovascular disease, and that the potential risks are increased with long-term use, according to Dr. Doshi.

“It is important to recognize that NSAIDs, although without many side effects for the central nervous system, do have potential risks associated with the kidneys, heart, and the GI system.”

Chronic and Acute Pain Relief

NSAIDs are widely used to address various types of pain, including chronic and acute cases.

Dr. Doshi, who cares for patients at the Hopkins Pain Treatment Center, deals predominately with chronic pain, and NSAIDs are a key part of her practice. A

large component of her clinical care includes patients with low back pain.

Most clinical guidelines recommend NSAIDs as first- or second-line options for low back pain. However, clinicians must take potential adverse effects on gastrointestinal, hepatic, cardiovascular, and renal systems into account, especially among vulnerable patients like the elderly (*Expert Opin Pharmacother* 2020).

Given the inflammation associated with an injury, NSAIDs are also an effective option for acute pain. Additionally, they can reduce the swelling and pain caused by a muscle strain or sprain.

Dr. Doshi specializes in trigeminal neuralgia and other types of craniofacial pain and often sees patients who have been misdiagnosed. “Many of the patients I see either don’t actually have trigeminal neuralgia or they do have the condition along with some other type of pain, such as migraine or temporomandibular disorder – both of which can respond to NSAIDs.

When selecting the right type of NSAID, a number of factors must be considered, starting with a patient’s medical history. Do they have a history of GI disturbances or cardiac events? Once a patient’s risk factors have been assessed, other determinations must be made.

“Many times, people will have already tried over-the-counter NSAIDs – the most common being ibuprofen and naproxen,” Doshi said. “If they haven’t tried those, I will sometimes suggest we start there.

“If they are complaining that NSAIDs work for them, but they have some stomach upset that still persists when taking with meals, I will then suggest meloxicam, which is more COX-2 selective at lower doses.”

For patients without a significant cardiovascular disease history, celecoxib is a good option, according to Dr. Doshi, especially for those who need COX-2 selectivity to avoid GI complications. “The problem,” she noted, “is that insurance often doesn’t cover celecoxib, unless other options have failed. Many times, I will start with meloxicam, unless there is a compelling medical indication for celecoxib.”

Lastly, Dr. Doshi considers the best formulation to use. “Some patients may hate pills, or they have other comorbidities increasing their risk of some of the systemic effects of NSAIDs,” she explained.

“In that case, they may be good candidates for topical formulations, such as gel or patch, which have decreased systemic absorption.”

NSAIDs in the Operative Setting

NSAIDs also have a role in the surgical setting among a variety of patient populations.

“Recently, there has been this idea of using NSAIDs in the perioperative set-

ting, specifically in terms of enhanced recovery protocols” said Dr. Doshi. “More clinicians have been incorporating these agents in this space, while keeping in mind the potential risks.

“Increased risk of bleeding as well as renal insufficiency are the top concerns in the surgical setting,” she continued, noting that while these risks should be considered in treatment decisions, there is potential for NSAIDs in this area. “For instance, the use of NSAIDs prior to joint surgery could

“We now have a greater appreciation for the fact that nerve-related pain can sometimes have an inflammatory component, and the immune system may modulate how people experience this type of pain.”

—Tina Doshi, MD, MHS

Assistant Professor of Anesthesiology and Critical Care Medicine, Johns Hopkins Medicine

help with non-opioid adjuvant pain management to help patients recover and get on their feet sooner.”

“A number of surgeons in a variety of specialties are interested in the use of NSAIDs pre- and post-operatively,” noted Andrew Fleischman, MD, Department of Anesthesiology at Thomas Jefferson University Hospital. “Many are starting to consider the administration of NSAIDs prior to a patient receiving anesthesia.

“Surgery is very inflammatory provoking,” he continued. “While opioids may still be used for initial pain, NSAIDs are valuable due to their anti-inflammatory effect. And if you can stop this process early, it is much better for patients and their recovery.”

Given growing concerns regarding the misuse of opioids as well as increasing evidence that multimodal analgesia provides superior pain control with fewer adverse events, there is an expanding postoperative role for NSAIDs. However, concerns remain, especially when it comes to GI-related side effects.

Dr. Fleischman and his colleagues recently conducted a study to better understand the benefits and risks of NSAIDs in this setting. The findings, which were presented at ANESTHESIOLOGY 2019, demonstrated the safety of NSAID use following orthopedic surgery (*Abstract A2226*).

“There is limited research in this area and we sought to confirm that NSAID use would not be associated with an increase in postoperative GI bleeding after joint surgery,” Dr. Fleischman explained. “We found that there is a very low risk of this complication with 74 (0.26%) of 28,794 patients experiencing GI bleeding within 90 days.

“Some clinicians are hesitant to use scheduled dose medications due to concerns regarding adverse events, but the evidence shows this is an effective method of pain management,” he said. “Instead of using NSAIDs as needed, taking the medicine every 4-6 hours will make the patients more comfortable overall.”

Until now, data has been limited; however, Dr. Fleischman and his colleagues have demonstrated that patients who don’t have a major risk factor can benefit from postoperative NSAID use on scheduled dosing.

“The implications of this study go beyond the orthopedic specialty,” he noted. “NSAIDs are a promising option in the surgical setting that can offer an array of benefits to our patients.”

Ongoing Exploration

While NSAIDs are already employed in a number of ways, there are a variety of research and clinical avenues to explore.

One area of interest, according to Dr. Doshi, involves reconsidering the type of pain NSAIDs can address. “Historically, we have used NSAIDs for muscle and joint pain, but not for nerve-related pain,” she said. “We tend to think of pain as being nociceptive versus neuropathic. Each have very different characteristics and treatment options.”

Dr. Doshi noted that when it comes to issues like diabetic neuropathy, research has shown that NSAIDs are not more effective compared to placebo. However, she said, “we now have a greater appreciation for the fact that nerve-related pain can sometimes have an inflammatory component, and the immune system may modulate how people experience this type of pain.

Additionally, there has been a growing public interest in dietary and nutritional supplements, especially as they relate to pain management.

“Current research has compared NSAIDs and nutritional supplements or has used them in combination, to better understand their impact on pain management,” she explained. “This is an interesting area of further study, especially since many people in chronic pain do report using some type of nutritional supplement in an effort to ease their discomfort.” ■