Brazilian Journal of Anesthesiology 2022;72(5): 549—552

Sociedade Brasileira de Anestesiologia

Brazilian Journal of ANESTHESIOLOGY

EDITORIAL

Anesthesiology and pain medicine

Pain medicine was born in the cradle of Anesthesiology, given pain management has been one of the priorities since the beginning of the specialty. It is not by accident that the International Association for the Study of Pain IASP was created thanks to the determination of John Bonica, an American anesthesiologist.[1] In the United States, the idea of establishing pain management as a specialty emerged as early as 1989, and in 1990 the American Board of Anesthesiologists suggested the creation of the certification in pain to the American Board of Medical Specialties. The request was approved the following year. The first residency program in Pain Management was approved only in 1992. Later, in 2002, it was renamed Pain Medicine.[2]

In Brazil, the creation of residency programs preceded the acknowledgement of Pain Management as area of practice by the Federal Council of Medicine (CFM). One of the first Residency Programs in the area was organized at the Department of Anesthesiology of Faculdade de Medicina de Botucatu, Unesp and its first specialist graduated in 1994. Since its implementation, the Brazilian Society of Anesthesiology (SBA) has participated in the certification process of pain specialists. As of Resolution CFM n° 1.973/2011, another eight specialties can also apply for certification in Pain Management.[3]

Anesthesiologists have currently expanded their practice, formerly restricted to the operating room, to include perioperative medicine. The latter encompasses treatment of acute pain, postoperative and intensive care, in addition to chronic pain medicine, sleep medicine, and palliative care. Anesthesiology began to manage pain as a *continuum*, not limited to the intraoperative period.[4]

Acute pain response means identifying injury to avoid its recurrence as a survival mechanism. Onset and end of acute pain are related to the wound healing process. The more intense the trauma, the stronger is the register that something went wrong.[5] Thus, based on the idea that every stimulus from trauma causes memory, our early traumatic experiences related to loss, separation, frustration and physical injury may be the basis for a complex neuronal network able to express cause-effect inter-relations.[6] Therefore, for every acute trauma-related pain, such as perioperative pain, there is a physiological and emotional component of neuronal stimulation or a mental overload related to an individual's past history.

In this scenario, anxious and depressive patients have a lower threshold for response to tissue injury. Conversely, the way of dealing with disease may be more a factor related to the higher intensity of acute pain, than to mental disorder itself.[7]

Based on this assumption and on the higher occurrence of perioperative depression in the obese, the study of Tapar et al published in the current issue analyzed how the tendency toward catastrophizing can influence pain intensity and analgesic consumption during the postoperative period of laparoscopic surgery for obesity. The study included 72 participants without anxiety, depression, chronic pain or contraindication for morphine. The authors concluded that morphine consumption in the first 24 hours postoperatively had a strong negative correlation with pain tolerance scores; strong and positive correlation with high scores in a pain catastrophizing scale; moderate and positive correlation with anxiety and depression scores; and strong and positive correlation with pain intensity in the period observed. The article underlines what has already been reported in the literature and indicates obesity as a risk factor for depression, failure in dealing with suffering, catastrophizing propensity, and high scores for anxiety.[7]

Coincidentally, there is a high prevalence of mental disorders, such as anxiety or depression, in chronic pain.[8] Epidemiological studies have emphasized that there is a high prevalence of chronic pain in joints, and in lumbar and cervical regions.[9] Other factors can be associated with musculoskeletal pain in workers, mainly sedentarism, physical inactivity, obesity, and female sex. Higher occurrence of musculoskeletal pain in women may be due to lower muscle mass, greater hormone variation, double duty, lower maximum tolerance to mechanical stimulus, and lower response to pain pressure threshold (PPT). A study by Cordeiro et al, available in the current issue, showed that unlike in men, physical activity in women does not interfere as much in the

https://doi.org/10.1016/j.bjane.2022.07.007

maximum tolerance to mechanical stress as it does in PPT. This was demonstrated in an elegant study that showed that individuals who exercise a lot, mainly men, have higher PPT.[10]

In addition to constitutional factors inherent to each individual, early records of pain from birth may not be accessible to conscious recollection, although, they are codified in one's memory and promote abnormal behavioral patterns and modified sensorial processing in the future, possibly throughout an individual's lifetime. Some authors verified that animals exposed to repeated pain stimuli during the neonatal period, when adults, showed more anxiety and defensive behavior, associated with increased pain transmission.[11] An ill-adapted response to pain is observed in catastrophizing patients. Often, catastrophizing is regarded as a response within the anxiety and depression scenario, and it is characterized by irrational negative anticipation of future health events.[12]

The pediatric version of the pain catastrophizing scale (PCS-C) was validated in Brazil by Schneider et al and is published in the current issue. The validation showed effective linguistic translation and cultural adaptation. The tool emphasizes that we should study the impact of tissue trauma since early age, since chronic pain in children and adolescents has a prevalence of 20 to 30%, and leads to school absenteeism, anxiety, depression, and catastrophizing thoughts throughout life. High catastrophizing scores are associated with emotional suffering, physical inability, and high pain scores, and should be diagnosed throughout chronic pain management.[13]

It is important to remember that chronic pain management, mainly for adolescents, should follow a biopsychosocial model, with adequate assessment, mensuration, and diagnosis of symptoms, avoiding disastrous consequences in adulthood. Adequate multidisciplinary pain treatment for children and adolescents, with well-established pharmacological and non-pharmacological approaches have an effective positive impact on consumption of health services and reduction in operational costs, as it is shown in the review conducted by Silva et al published in the current issue.[14]

Regional blocks have become increasingly important in acute pain clinical practice. They bring on many benefits such as effective control of postoperative pain reducing systemic opioid consumption, and consequently promoting fewer adverse effects. However, there are risks that should be considered. In the current issue, Campos et al analyze the complications related to regional blocks in a sample of over 10,000 patients followed up by a tertiary hospital acute pain service. Roughly, 10% of the sample had some form of block-associated adverse effect, more frequent when neuraxis blocks were employed.[15]

As a multimodal analgesia component, regional techniques optimize postoperative acute pain control, and provide major advantages, such as shorter hospital length of stay, fewer pain-related readmissions, faster progression to post-anesthesia recovery phase II, higher compliance to physical therapy rehabilitation, and higher satisfaction scores.[16] Regional anesthesia techniques contribute to fewer opioid-associated adverse effects, and possibly reduce the risk of late postoperative opioid abuse, a contributing factor to the so-called "opioid crisis".[17]

Also in the current issue, Jowkar et al studied patients submitted to lumbar spine surgery and recorded an over 50% reduction in postoperative morphine consumption associated with continuous wound infiltration with local anesthetic via a catheter inserted into the surgical wound. In addition to classical neuraxis analgesia techniques, interfascial blocks have recently gained acceptance, and the increased availability and use of ultrasonography intraoperatively have enabled the identification of several anatomical sites for single shot or continuous local anesthetic injections.[18]

Suboptimal management of post-arthroplasty lower limb pain may result in reduced range of joint movement postoperatively, longer hospital length of stay, higher risk of thromboembolism, and may affect long-term joint function. Regional anesthesia can improve passive knee flexion, even months after surgery.[19] The continuous adductor canal block was superior to continuous femoral block, in a prospective randomized, controlled study with 60 participants submitted to knee arthroplasty, published by Sinha et al in the current issue.[20] Indeed, continuous or bolus adductor canal block has been recently considered as level of evidence 1a in this type of surgery.[21]

Reduction in opioid consumption and satisfactory analgesia in thoracic and abdominal surgeries, mastectomies, rib and vertebral body fractures have also been reported with the use of erector spinae plane block (ESPB) and serratus plane block (SPB).[22] They are also used as the regional anesthesia approach to treat chronic neuropathic thorax pain.[23] Two studies discuss these blocks in the current issue.

The first, by Arora et al, included 40 participants submitted to breast surgery and compared the traditional thoracic paravertebral block approach to SPB. The findings revealed that SPB resulted in longer time between surgery completion and the first rescue analgesia dose administered, lower pain scores, and lower nausea and vomiting incidence.[24] In the second study with 54 participants submitted to cardiac surgery, Silva et al assessed the efficacy of ESPB using bilateral single-shots of 0.5% ropivacaine (20 mL on each side). All individuals received multimodal anesthesia. Patients receiving ESPB showed lower morphine consumption, and lower pain scores only in the first 6 postoperative hours.[25]

In the past decade, multiple interfascial blocks techniques were introduced for acute pain management and their role has reached scientific soundness. Küpeli et al reported, in the current issue, two cases of shoulder surgery in which the pericapsular nerve group block (PENG block) was used. The PENG block was safe anesthesia and analgesia-wise, but alone may not be a sufficient anesthetic technique. There are still many questions and limitations related to PENG block regarding its mechanism of action, analgesic efficacy, pharmacokinetics, pharmacodynamics, and adverse effects.[26]

Despite increasing acceptance of regional analgesia techniques, opioids still play an essential role in acute postoperative pain management. However, judicious use is warranted by prescribing lower doses and for the shortest time possible.[27] The current issue brings three interesting studies assessing multimodal techniques of systemic analgesia.

Muniz da Silva et al compared three analgesia strategies for laparoscopic bariatric surgeries. Two techniques

employed sufentanil at anesthesia induction, followed by continuous infusion of remifentanil (P1) or dexmedetomidine (P2). Morphine was used for postoperative analgesia in the P1 and P2 techniques. The third technique (P3) used remifentanil during induction and maintenance, plus single doses of methadone, lidocaine, dexmedetomidine and magnesium — without administering any other opioid intraoperatively. The authors concluded that higher doses of sufentanil (P1) intraoperatively result in higher requirement of rescue analgesics and more intense pain when compared to multimodal technique that includes methadone. The postoperative incidence of nausea and vomiting was lower for P3.[28]

Savaji et al employed a standardized anesthetic technique with fentanyl/ nitrous oxide/isoflurane for robotic abdominal hysterectomy, and compared lidocaine, dexmedetomidine, lidocaine/dexmedetomidine to placebo. All interventions used loading and maintenance doses. Postoperative (PO) analgesia was performed using patient-controlled analgesia with fentanyl for all participants of the study. The lidocaine/dexmedetomidine combination resulted in lower PO pain scores and fentanyl consumption, in addition to enhanced quality recovery.[29]

In a narrative review including six studies, of which only two were high-quality, Chinchilla and Moyano analyzed the efficacy of opioids, gabapentinoids, ketamine, and lidocaine to control post-procedure acute pain for burned patients. The evidence of efficacy found was limited due to the low number of studies included, albeit favorable to fentanyl, nalbuphine and ketamine, and unfavorable to lidocaine and gabapentinoids.[30]

Even old and simple techniques, such as intercostal nerve blocks (INB), may be clinically valuable when appropriately assessed and promoted. Thus, Xiao et al, in a study also available in the current issue, revealed that INB provided better analgesia for video thoracoscopes when performed preemptively.[31] Better understanding of the mechanism of action, distribution, systemic absorption, interaction with multimodal analgesia, and benefits in comparison to other techniques should be continuously encouraged.

By providing readers with quality scientific information, the current issue aims to offer important data regarding pain management in several scenarios, and by using different tools and techniques.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. International Association for the Study of Pain - IASP [Internet]. [cited 2022 Jul 12]. Available from: https://en.wikipedia.org/wiki/International_Association_for_the_Study_of_Pain
2. Owens WD, Abram SE. The genesis of pain medicine as a subspecialty in anesthesiology. J Anesth Hist. 2020;6:13—6.
3. Resoluções do Conselho Federal de Medicina [Internet]. [cited 2022 Jul 12]. Available from: https://sistemas.cfm.org.br/normas/visualizar/resolucoes/BR/2011/1973%0D%0A
4. Kain ZN, Fitch JCK, Kirsch JR, Mets B, Pearl RG. Future of anesthesiology is perioperative medicine. Anesthesiology. 2015;122:1192—5.
5. Rocha APC, Kraychete DC, Lemonica L, et al. Dor: aspectos atuais da sensibilização periférica and central. Rev Bras Anestesiol. 2007;57:94—105.
6. Ploghaus A, Narain C, Beckmann CF, et al. Exacerbation of pain by anxiety is associated with activity in a hippocampal network. J Neurosci. 2001;21:9896—903.
7. Tapar H, Özsoy Z, Balta MG, Daşıran F, Tapar GG, Karaman T. Associations between postoperative analgesic consumption and distress tolerance, anxiety, depression, and pain catastrophizing: a prospective observational study. Braz J Anesthesiol. 2022;72:567—73.
8. Castro M, Kraychete D, Daltro C, Lopes J, Menezes R, Oliveira I. Comorbid anxiety and depression disorders in patients with chronic pain. Arq Neuropsiquiatr. 2009;67:982—5.
9. Sá K, Baptista AF, Matos MA, Lessa I. Prevalência de dor crônica e fatores associados na população de Salvador. Bahia. Rev Saude Publica. 2009;43:622—30.
10. Cordeiro MA, dos Santos MBR, Zotz TGG, de Macedo ACB. The influence of sex and level of physical activity on maximum tolerance to mechanical pain. Braz J Anesthesiol. 2022;72:579—86.
11. Grunau RE, Holsti L, Peters JWB. Long-term consequences of pain in human neonates. Semin Fetal Neonatal Med. 2006;11:268—75.
12. Quartana PJ, Campbell CM, Edwards RR. Pain catastrophizing: a critical review. Expert Rev Neurother. 2009;9:745—58.
13. Schneider L, Castro SM de J, Mallman ES, et al. Validation of the Brazilian version of the child pain catastrophizing scale and its relationship with a marker of central sensitization. Braz J Anesthesiol. 2022;72:614—21.
14. Silva C, Oliveira D, Pestana-Santos M, Portugal F, Capelo P. Chronic non-cancer pain in adolescents: a narrative review. Braz J Anesthesiol. 2022;72:648—56.
15. Campos MG, Peixoto AR, Fonseca S, Santos F, Pinho C, Leite D. Assessment of main complications of regional anesthesia recorded in an acute pain unit in a tertiary care university hospital: a retrospective cohort. Braz J Anesthesiol. 2022;72:605—13.
16. Joshi G, Gandhi K, Shah N, Gadsden J, Corman SL. Peripheral nerve blocks in the management of postoperative pain: challenges and opportunities. J Clin Anesth. 2016;35:524—9.
17. Brown CR, Chen Z, Khurshan F, Groeneveld PW, Desai ND. Development of persistent opioid use after cardiac surgery. JAMA Cardiol. 2020;5:889.
18. Jowkar S, Farbood A, Amini A, et al. Effect of continuous intra-incisional bupivacaine on postoperative pain in non-traumatic spinal fixation surgeries: a randomized controlled trial. Braz J Anesthesiol. 2022;72:599—604.
19. Atchabahian A, Schwartz G, Hall CB, Lajam CM. Andreae MH. Regional analgesia for improvement of long-term functional outcome after elective large joint replacement. Cochrane Database Syst Rev. 2015;2015:CD010278.
20. Sinha C, Singh AK, Kumar A, Kumar A, Kumar S, Kumari P. Analgesic effect of continuous adductor canal block versus continuous femoral nerve block for knee arthroscopic surgery: a randomized trial. Braz J Anesthesiol. 2022;72:553—9.
21. Kim DH, Kim SJ, Liu J, Beathe J, Memtsoudis SG. Fascial plane blocks: a narrative review of the literature. Reg Anesth Pain Med. 2021;46:600—17.
22. Gürkan Y, Aksu C, Kuş A, Yörükoğlu UH. Erector spinae plane block and thourcic paravertebral block for breast surgery compared to IV-morphine: A randomized controlled trial. J Clin Anesth. 2020;59:84—8.
23. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block. Reg Anesth Pain Med. 2016;41:621—7.
24. Arora S, Ovung R, Bharti N, Yaddanapudi S, Singh G. Efficacy of serratus anterior plane block versus thourcic paravertebral block for postoperative analgesia after breast cancer surgery: a randomized trial. Braz J Anesthesiol. 2022;72:587—92.

25. Altiparmak B, Toker MK, Uysal Aİ, Kuşçu Y, Demirbilek SG. Efficacy of ultrasound-guided erector spinae plane block for analgesia after laparoscopic cholecystectomy: a randomized controlled trial. Braz J Anesthesiol. 2019;69:561—8.
26. Küpeli İ, Yazici Kara M. Anesthesia or analgesia? New block for shoulder surgery: pericapsular nerve group block. Braz J Anesthesiol. 2022;72:669—72.
27. Macintyre PE, Quinlan J, Levy N, Lobo DN. Current issues in the use of opioids for the management of postoperative pain. JAMA Surg. 2022;157:158.
28. Silva LM da, Ho AMH, Oliveira DR de, et al. Comparison of three intraoperative analgesic strategies in laparoscopic bariatric surgery: a retrospective study of immediate postoperative outcomes. Braz J Anesthesiol. 2022;72:560—6.
29. Sivaji P, Agrawal S, Kumar A, Bahadur A. Evaluation of lignocaine, dexmedetomidine, lignocaine-dexmedetomidine infusion on pain and quality of recovery for robotic abdominal hysterectomy: a prospective randomized controlled trial. Braz J Anesthesiol. 2022;72:593—8.
30. Chinchilla PA, Moyano J. Efficacy of opioids and non-opioid analgesics in the treatment of post procedure pain of burned patients: a narrative review. Braz J Anesthesiol. 2022;72:637—47.
31. Xiao W, Zhou W, Chen X, Zhu J, Xue Q, Shi J. Analgesic effect of intercostal nerve block given preventively or at the end of operation in video-assisted thourcic surgery: a randomized clinical trial. Braz J Anesthesiol. 2022;72:574—8.

Guilherme Antonio Moreira de Barros [a,*], Durval Campos Kraychete [b], Eric Benedet Lineburger [c], Norma Sueli Pinheiro Módolo [a]

[a] *Universidade Estadual Paulista (UNESP), Faculdade de Medicina de Botucatu (FMB), Departamento de Especialidade Cirúrgica e Anestesiologia, Botucatu, SP, Brazil*
[b] *Universidade Federal da Bahia (UFBA), Departamento de Anestesiologia e Cirurgia, Salvador, BA, Brazil*
[c] *Hospital São José, Anestesiologia e Controle da Dor, Criciúma, SC, Brazil*

[*] Corresponding author.
E-mail: guilherme.am.barros@unesp.br (G.A. de Barros).