The American Journal of Medical Sciences and Pharmaceutical Research (ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

Journal Website: https://theamericanjournals.com/index.php/tajmspr

Research Article

SCIENTIFIC UPDATE ON POST-OPERATIVE PAIN MANAGEMENT IN ORTHOPEDIC SURGERY

Submission Date: October 29, 7023, Accepted Date: November 03, 2023,
Published Date: November 08, 2023 |
Crossref doi: https://doi.org/10.37547/TAJMSPR/Volume05Issue11-02

Bianca Gabriella De Oliveira
Medical Student at The University Salvador - UNIFACS, Salvador, BA, Brazil

Melissa Alves Aires Marques
Medical Student at The University Iguaçu - UNIG, Itaperuna, RJ, Brazil

Ábila Dutra Oliveira
Resident Doctor Ortopedia E Traumatologia Do Hospital Santa Casa De Misericórdia De Vitória, ES, Brazil

Cícero Azevedo De Moraes Filho
Medical Student at the UNINASSAU, Recife, PE, Brazil

Paloma Pinheiro De Aquino Peixoto
Medical Student at the UNINASSAU, Recife, PE, Brazil

Fabricio Negreiros Holtz
Doctor Orthopedist And Traumatologist No Hospital Universitário De Nova Iguaçú(UNIG), Rio De Janeiro, RJ, Brazil

Rafael Costa Nerys
Doctor Orthopedist and Traumatologis No Hospital Estadual De Urgências De Goiás - Dr Valdemiro Cruz (HUGO), Goiânia, GO; Shoulder and Elbow No Hospital das Clínicas Da UFG, Goiânia, GO, Brazil

Laís Cristina Pereira Da Silva
Medical Student at The University Salvador - UNIFACS, Salvador, BA, Brazil

Marcella Rodrigues Costa Simoes
Doctor Orthopedist and Traumatologist No Hospital da Baleia, Belo Horizontes, MG; Hand and Microsurgery Surgeon No Hospital Maria Amélia Lins (FHEMIG), Belo Horizonte, MG, Brazil

The American Journal of Medical Sciences and Pharmaceutical Research
(ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

ABSTRACT

Postoperative pain results from the nociceptive stimulus caused by the surgical aggression, coming from direct or indirect mechanisms. Its intensity and duration depends on several factors, mainly the type of surgical approach, surgical access and anatomy. Orthopaedic surgeries are considered one of the most painful, due to the intense nociceptive stimulation of the musculoskeletal tissue.The prevalence of post-operative pain is described in 73% of patients who experience moderate to severe pain on the first day after surgery. A lower prevalence is observed in developed countries, due to pain protocols, the presence of acute pain services and advanced general anesthesia techniques. Numerous protocols have been tested, and opioids are often the drugs of choice, but the events are considered the biggest drawback. Pain control can be achieved through the use of certain medications, the use of physical means and interventions related to cognitive behavior, such as educational techniques and relaxation. Even though it is difficult to treat pain, analgesic methods are essential to reduce the incidence of persistent pain, avoiding and alleviating future chronic pain conditions that are difficult to treat.

KEYWORDS

Pain management; Postoperative pain; Postoperative pain in orthopedic surgeries; Chronic pain; Orthopedic surgeries.

INTRODUCTION

Pain is defined as a sensory and emotional experience that can result from actual or potential tissue damage(Alves, et al., 2009). When the tissue suffers some kind of injury, the cells release prostaglandins which generate hypersensitivity, transforming any stimulus into pain, even if it is minimal(Fontes, Jaques, 2007).

Postoperative pain is defined as acute pain resulting from the nociceptive stimulus caused by surgical aggression and comes from direct or indirect mechanisms. Its intensity and duration depends on various factors, mainly the type of surgical approach, surgical access and anatomy (González, García, 2018). Orthopaedic surgeries are considered one of the most painful, due to the intense nociceptive stimulation of the musculoskeletal tissue, especially total arthroplasties, which result in moderate to intense pain(Pitchon, et al., 2018; Chunduri, Aggarwal, 2022; Galvan, et al., 2020).

Patients who undergo orthopedic surgery usually have musculoskeletal dysfunctions, such as unstabilized fractures, joint diseases, deformities, necrotic or infected tissues, tumors or trauma. The most frequent surgical procedures include open reduction with internal fixation and closed reduction with internal fixation in fractures, arthroplasty, meniscectomy and joint replacement and amputations. The aims of the procedures include: improving function by restoring movement and stability, as well as relieving disability and pain (Smeltzer, Bare, 2005).

The painful experience can negatively affect the recovery and quality of life of these individuals. As well as frequent complaints of pain in the post-operative period of osteosynthesis, effective pain management in this period is essential, given the chronicity of the pain. And when controlled, it considerably reduces the chance of it becoming chronic, and has a better prognosis and functionality after therapeutic intervention (Liggieri, et al., 2019).

The American Journal of Medical Sciences and Pharmaceutical Research
(ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

Postoperative analgesia in orthopedic approaches will rarely be effective in monotherapy, with multimodal analgesia. This is due to the different pathophysiological mechanisms for the existence of the symptom in question (González, García, 2018).

Pain control in this period involves everything from prescribing analgesics at fixed times to prevent pain peaks, using sophisticated technologies such as epidural catheters, to cognitive-behavioral interventions such as music, relaxation and other educational activities. The correct treatment of postoperative pain is not only a pathophysiological issue, but also an economic and ethical one. Thus, better pain control avoids suffering, provides greater patient satisfaction with care and reduces costs related to possible complications, which require prolonged hospitalization(Pimenta, et al., 2001).This review aims to examine the scientific literature on postoperative pain, with an emphasis on evaluating the most commonly used medications. It is hoped to provide an up-to-date overview of the main drugs available and effective for better pain management.

METHOD

An extensive literature search was carried out to identify studies related to postoperative pain. We used the Pubmed, Scientific Electronic Library Online (SciELO) and Latin American and Caribbean Literature in Health Sciences (LILACS) databases, Google Scholar and the Public Ministry's Virtual Health Library, using the following search terms: "postoperative pain after orthopedic surgery", "postoperative pain management" and "treatment of postoperative pain".

We included randomized clinical trials, systematic reviews, meta-analyses and observational studies carried out between 2018-2023. We considered articles that addressed relevant aspects related to postoperative pain, with treatment strategies and clinical outcomes. Studies focusing on chronic pain were discarded.

As this is a public domain database, it was not necessary to submit the project to the Research Ethics Committee. It is worth noting that the data available in this system may be updated periodically, including in periods prior to the current year.

RESULTS

The prevalence of postoperative pain can be described as up to 73% of patients experiencing moderate to severe pain on the first day after surgery. A lower prevalence is observed in developed countries, due to pain protocols, the presence of acute pain services and advanced general anesthesia techniques (Ndebea, et al., 2020).

Many analgesic protocols have been tested, and opioids are often the drugs of choice, but adverse events are considered the biggest drawback. Interestingly, studies have shown that tapentadol promotes a reduction in pain when compared to the use of paracetamol. When associated with the use of ketoprofen, there was a reduction in pain intensity and satisfactory tolerance (D'Amato, et al., 2019).

The use of paracetamol favors a significant reduction in pain and opioid consumption in the first few days after surgery, with no side effects. However, given its drug class, bioavailability, pharmacokinetics and excretion, it should be used with an appropriate dosage and paying attention to signs of organic impairment (Pitchon, et al., 2018; Lavand'homme, et al., 2022).

Specific COX-2 inhibitors have been shown to reduce postoperative pain, reduce the use of opioids, but do not reduce the side effects of opioids. Repeated doses

The American Journal of Medical Sciences and Pharmaceutical Research
(ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

of glucocorticoids have been shown to reduce pain and opioid administration, but there are no safety studies available. However, gabapentinoids are not recommended as they do not promote analgesia. The use of ketamine is still not recommended due to the lack of evidence regarding analgesia (Lavand'homme, et al., 2022).

Multimodal treatment with paracetamol, ibuprofen, dexamethasone and infiltrative analgesia reduced morphine consumption after an orthopedic approach, thereby reducing the adverse effects related to opioid use. In order to reduce the risk and obtain the best effect from opioids, precise indications and periodic evaluations are necessary. Prolonged use of opioids causes numerous cellular alterations responsible for the development of clinical alterations such as tolerance, withdrawal syndrome and dependence (Gasbjerg, et al., 2022).

DISCUSSION

According to the literature, orthopedic surgery is one of the main causes of severe pain in patients undergoing outpatient surgery. In addition to the pain reported by the patient, many procedures involve a complex pain mechanism(Silva,Pimenta, 2003), making it clear that perioperative pain control still deserves greater attention and care in its evaluation by health professionals(Barbosa, et al., 2014).

A study carried out in 2010 by the Center for Studies in Orthopedics and Traumatology in conjunction with the Sports Traumatology Committee and the Brazilian Society of Orthopedics and Traumatology of São Paulo observed that multimodal management of perioperative pain has been the most indicated practice, consisting of the use of numerous drugs, with different mechanisms of action, enhancing the analgesic effect and reducing possible complications. A major benefit of NSAIDs in the postoperative period of orthopaedic surgery is their simultaneous use with other drugs, requiring lower doses of opioids for pain control, which is extremely beneficial for patients undergoing analgesia treatment regimens using several drugs (Silva, et al., 2010). In this way, effective pain analgesia results in faster recovery and greater compliance with treatment, with better post-surgical results(Pimenta, et al., 2001).

Postoperative pain control can be achieved through the use of NSAIDs, opioids, various methods and routes, the use of physical means and interventions related to cognitive behavior, such as educational techniques, relaxation, distraction, among others(Pimenta, et al., 2001; Smeltzer, Bare, 2005; Bassanezi, Oliveira, 2006; Porto, 2004; Silva,Pimenta, 2003). The increase in the use of opioids as therapeutic management for chronic pain is evident, as is the controversial debate as to whether this medication causes more harm than good (Lavand'homme, et al., 2022; Gasbjerg, et al., 2022; Fishman, 2011). There is no strong data to support the long-term use of opioids for pain relief, given that around 30% of individuals have chronic pain and of these, 10% are treated with opioids. Chronic pain control is often achieved with a doctor's prescription of opioids in combination with other medications (Brill, Ginosar, Davidson, 2006).

Although it is difficult to treat pain, such analgesic methods are essential to reduce the incidence of persistent pain in the post-operative period, with the aim of avoiding and alleviating chronic pain that will be difficult to treat in the future(Silva, et al., 2010).

CONCLUSION

In conclusion, postoperative pain from orthopedic surgery is a negative experience for patients. Therefore, it is of great value to assess the

The American Journal of Medical Sciences and Pharmaceutical Research (ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

characteristics of the pain individually and thoroughly, in order to effectively manage the patient's complaint and, consequently, prevent acute pain from becoming chronic pain and directly interfering with the patient's quality of life. Multimodal treatment has shown good results in terms of pain reduction, side effects and tolerance. It is therefore important to develop effective analgesic protocols.

REFERENCES

1. Alves, A.N., Costa, C.M.C., Siqueira, J.T.T., Teixeira, M,J. (2009). Dor: princípios e prática. Porto Alegre(RS): Artmed.
2. Bassanezi, B.S.B.,Oliveira Filho, A.G.(2006). Analgesia pós-operatória. Rev.Col. Bras. Cir. 33(2): 116-22.
3. Barbosa, M. H., Araújo, N. F. D., Silva, J. A. J. D., Corrêa, T. B., Moreira, T. M., & Andrade, É. V. (2014). Avaliação da intensidade da dor e analgesia em pacientes no período pós-operatório de cirurgias ortopédicas. Escola Anna Nery, 18, 143-147.
4. Brill, S., Ginosar, Y., Davidson, E.M. (2006). Perioperative management of chronic pain patients with opioid dependency. Curr Opin Anaesthesiol. 19(3):325-31.
5. Chunduri, A., Aggarwal, A.K. (2022). Multimodal Pain Management in Orthopedic Surgery. J Clin Med. 28;11(21):6386.
6. D'Amato, T., Martorelli, F., Fenocchio, G., Simili, V., Kon, E., Di Matteo, B., Scardino, M. (2019). Tapentadol vs oxycodone/naloxone in the management of pain after total hip arthroplasty in the fast track setting: an observational study. J Exp Orthop. 29;6(1):36.
7. Fishman, S,M. (2011). Strategies for selecting treatment and mitigating risk in patients with chronic pain. J Clin Psychiatry. 72(1):e02.
8. Fontes, K.B., Jaques, A.E. (2007). O papel da enfermagem frente ao monitoramento da dor como 5o sinal vital. Cienc. cuid. saude. 6(supl.2): 481-7.
9. Galvan, C., Paczek, R.S., de Brum, B.N., do Espírito Santo, D.M.N., Tanaka , A.K.S.da R., & Brito, D.T. (2020). A efetividade do tratamento da dor no pós operatório de cirurgias ortopédicas. Revista Eletrônica Acervo Saúde, 12(10), e4875.
10. Gasbjerg, K.S., Hägi-Pedersen, D., Lunn, T.H., Laursen, C.C., Holmqvist, M., Vinstrup, L.Ø., Ammitzboell, M., Jakobsen, K., Jensen, M.S., Pallesen, M.J., Bagger, J., Lindholm, P., Pedersen, N.A., Schrøder, H.M., Lindberg-Larsen, M., Nørskov, A.K., Thybo, K.H., Brorson, S., Overgaard, S., Jakobsen, J.C., Mathiesen, O. (2022). Effect of dexamethasone as an analgesic adjuvant to multimodal pain treatment after total knee arthroplasty: randomised clinical trial. BMJ. 4;376:e067325.
11. González, R., García, R. (2018). Eficacia analgésica de la combinación Morfina/Dexketoprofeno versus Morfina/Paracetamol em pacientes sometidos a cirugía de miembros inferiores. Boletín Médico de Postgrado. 34(1): 7-12.
12. Lavand'homme, P.M., Kehlet, H., Rawal, N., Joshi, G.P. (2022). PROSPECT Working Group of the European Society of Regional Anaesthesia and Pain Therapy (ESRA). Pain management after total knee arthroplasty: PROcedure SPEcific Postoperative Pain ManagemenT recommendations. Eur J Anaesthesiol. 1;39(9):743-757.
13. Liggieri, A. C., Tsai, A. W. W., Machado, E. S., Moraes, F. B. D., Liu, I. A. W., Forni, J. E. N., ... & Cohen, M. (2019). Tratado de dor musculoesquelética.
14. Ndebea, A.S., van den Heuvel, S.A.S., Temu, R., Kaino, M.M., van Boekel, R.L.M., Steegers, M.A.H. (2020). Prevalence and Risk Factors for Acute

The American Journal of Medical Sciences and Pharmaceutical Research (ISSN – 2689-1026)
VOLUME 05 ISSUE 11 Pages: 6-11
SJIF IMPACT FACTOR (2020: 5. 286) (2021: 5. 64) (2022: 6. 319) (2023: 7. 396)
OCLC – 1121105510
Publisher: The USA Journals

Postoperative Pain After Elective Orthopedic and General Surgery at a Tertiary Referral Hospital in Tanzania. J Pain Res. 19;13:3005-3011.

15. Pimenta, C.A.M., Santos, E.M.M., Chaves, L.D., Martins, L.M., Gutierrez, B.A.O. (2001). Controle da dor no pós- operatório. Rev. Esc. Enferm. USP.35(2): 180-3.
16. Pitchon, D.N., Dayan, A.C., Schwenk, E.S., Baratta, J.L., Viscusi, E.R. (2018).Updates on Multimodal Analgesia for Orthopedic Surgery. Anesthesiol Clin.36(3):361-373.
17. Porto, C.C. (2004). Exame Clínico: bases para a prática médica. 5a ed. Rio de Janeiro(RJ): Guanabara Koogan.
18. Silva, T.R., Machetto, A., Pedrinelli, A., Santili, C. (2010). Consenso Brasileiro sobre Dor Perioperatória em Ortopedia e Traumatologia Desportiva. Revista Brasileira de Ortopedia, 45(3):2-15.
19. Silva, Y. B. D., & Pimenta, C. A. D. M. (2003). Análise dos registros de enfermagem sobre dor e analgesia em doentes hospitalizados. Revista da Escola de Enfermagem da USP, 37, 109-118.
20. Smeltzer, S.C., & Bare, B.G. (2005). Brunner & Suddarth, Tratado de enfermagem médico-cirúrgica. In Brunner & Suddarth, Tratado de enfermagem médico-cirúrgica(pp. 1133-1133). 246.