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THERAPEUTIC CANNABIS FOR PAIN MANAGEMENT IN A PATIENT WITH CHIARI MALFORMATION TYPE I DURING CONCOMITANT SARS-COV-2 INFECTION.

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Short title: Pain management in SARS-CoV-2 infection in Chiari 1 malformation

Key words: Chiari malformation; SARS-CoV2; neuropathic pain; cannabis; rehabilitation.

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Dear Editor,

Chiari type I malformation (CM1) represents the most frequent posterior fossa malformation.[1] It involves both neural and skeletal elements, and it is characterized by the caudal herniation of the cerebellar tonsils below the foramen magnum, frequently associated to syringomyelia.[2,3] The most common symptom is suboccipital headache, exacerbated by physical exercise, Valsalva maneuver, and changes of body position.[1,3]

The management of CM1 includes medical and surgical strategies. Medical therapy is used to provide symptomatic relief through non-steroidal anti-inflammatory drugs and muscle relaxants. Surgical treatment is reserved for those patients with severe or worsening neurological symptoms, usually through posterior fossa decompression with or without duraplasty.[4,5]

We presented a case of a 32-years old woman, affected by CM1, diagnosed in 2011 for motor and sensory deficits. The patient was previously treated surgically with midline craniectomy and C1 laminectomy and extradural filum terminale sectioning thereafter for an incomplete neurological recovery. After the last surgery the patients did well. In March 2020, the patient experienced SARS-CoV2 infection and she presented at the emergency unit with fever, tachypnea, and tachycardia, cough, increase in blood inflammation indices and hypoxia needing NIV with CPAP. After admission in the medicine ward of our hospital, few days after COVID-19 onset, the patient experienced an intense suboccipital headache (VAS 10/10) and diffuses burning paresthesiae without dermatomeric distribution in the upper limbs. The pain was not responsive to any non-steroidal anti-inflammatory drugs and myorelaxants. This kind of symptoms was not present before in the patient's clinical history, hence she underwent a new MRI examination, which was stable compared to the previous ones.

Because of respiratory instability is a contraindications to opioid therapy due to the risk of opioid-induced respiratory depression[6], so it was prescribed oral therapeutic cannabis (Bediol®, 6,5% THC, 8% CBD), the initial prescription dose was 10 drops (4 mg/ml THC, 3.8 mg/ml CBD) daily, increased to 15 drops after 7 days, given the absence of adverse reactions.

After a substantial improvement in general conditions and the weaning from CPAP, she was discharge at home, with the prescriptions of 15 drops of Bediol® daily and a global reconditioning program with specific therapeutic exercises for the cervical spine and the left and most affected hemisoma. One-month follow-up, the patient improved significantly in global functioning, and suboccipital headache decreased considerably (VAS 1/10). The cannabiod therapy was therefore suspended.

Natural history of CM1 is characterized by slowly progressive neurological symptoms exacerbated by several factors, which suboccipital pain, caused by the intradural irritation of the herniated cerebellar tonsil on the upper cervical nerve roots, represents the most common clinical manifestation.[1,7] In this scenario, the acute treatment of this condition together with neuropatic pain, defined as a pain caused by a lesion or disease of the somatosensory nervous system[8], is challenging, especially in the context of SARS-CoV2 infection, in which is not advisable to start opioid therapy due to the risk of opioid-induced respiratory depression.

The neuro-invasive potential of SARS-CoV2 has been advocated as partially responsible for the acute respiratory failure of COVID-19 patients, through the invasion of the brainstem centers implicated in the respiratory control.[9] This group of neurons express μ-opioid receptors being, also, entangled in the opioid-induced respiratory depression suggesting a possible central synergic negative effect on the respiratory function.[10]

The role of the endocannabinoid system in the pathophysiology of neuropathic pain has been already established in literature.[10-13] Several studies have demonstrated significant pain relief and good tolerability profiles in the short-term use of cannabis for treatment of this type of pain.[14-18].

The key-role played by a personalized rehabilitation program aimed at compensating muscular and cardiorespiratory deconditioning and optimizing functional independence in SARS-CoV-2 patients after the acute phase has been recently emphasized.[19]

Based on the above-mentioned findings, the use of cannabinoid associated with an individualized rehabilitation program may led to an optimal control of occipital pain and to a considerable improvement in global performance in CM1 patient affected by SARS-CoV2 infections.

COMPLIANCE WITH ETICAL STANDARD

Conflict of interest

The authors report no conflict of interest.

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Ethical standards

All procedures were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent

Informed patient consent was obtained for inclusion in this article.

REFERENCES

1. Milhorat TH, Chou MW, Trinidad EM, et al. Chiari I malformation redefined: clinical and radiographic findings for 364 symptomatic patients. Neurosurgery. May 1999;44(5):1005-1017.

2. Milhorat TH, Capocelli AL, Jr., Anzil AP, et al. Pathological basis of spinal cord cavitation in syringomyelia: analysis of 105 autopsy cases. J Neurosurg. May 1995;82(5):802-812.

3. Spina A, Boari N, Gagliardi F, et al. Sudden onset of Chiari malformation type 1 in a young child after trauma. Childs Nerv Syst. Sep 2015;31(9):1589-1594.

4. Kular S, Cascella M. Chiari I Malformation. Treasure Island (FL): StatPearls Publishing LLC.; 2020.

5. Xu H, Chu L, He R, et al. Posterior fossa decompression with and without duraplasty for the treatment of Chiari malformation type I-a systematic review and meta-analysis. Neurosurg Rev. Apr 2017;40(2):213-221.

6. Boom M, Niesters M, Sarton E, et al. Non-analgesic effects of opioids: opioid-induced respiratory depression. Curr Pharm Des. 2012;18(37):5994-6004.

7. Cesmebasi A, Muhleman MA, Hulsberg P, et al. Occipital neuralgia: anatomic considerations. Clin Anat. Jan 2015;28(1):101-108.

8. Scholz J, Finnerup NB, Attal N, et al. The IASP classification of chronic pain for ICD-11: chronic neuropathic pain. Pain. Jan 2019;160(1):53-59.

9. Li YC, Bai WZ, Hashikawa T. The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. J Med Virol. Jun 2020;92(6):552-555.

10. Lee G, Grovey B, Furnish T, et al. Medical Cannabis for Neuropathic Pain. Curr Pain Headache Rep. Feb 1 2018;22(1):8.

11. Maldonado R, Baños JE, Cabañero D. The endocannabinoid system and neuropathic pain. Pain. Feb 2016;157 Suppl 1:S23-32.

12. Russo E.B. HAG. Role of Cannabinoids in Pain Management. In: Deer T. et al. (eds) Comprehensive Treatment of Chronic Pain by Medical, Interventional, and Integrative Approaches. Springer, New York, NY. 2013.

13. Scotter EL, Abood ME, Glass M. The endocannabinoid system as a target for the treatment of neurodegenerative disease. Br J Pharmacol. Jun 2010;160(3):480-498.

14. Andreae MH, Carter GM, Shaparin N, et al. Inhaled Cannabis for Chronic Neuropathic Pain: A Meta-analysis of Individual Patient Data. J Pain. Dec 2015;16(12):1221-1232.

15. Wilsey B, Marcotte T, Tsodikov A, et al. A randomized, placebo-controlled, crossover trial of cannabis cigarettes in neuropathic pain. J Pain. Jun 2008;9(6):506-521.

16. Ware MA, Wang T, Shapiro S, et al. Smoked cannabis for chronic neuropathic pain: a randomized controlled trial. Cmaj. Oct 5 2010;182(14):E694-701.

17. Wilsey B, Marcotte T, Deutsch R, et al. Low-dose vaporized cannabis significantly improves neuropathic pain. J Pain. Feb 2013;14(2):136-148.

18. Whiting PF, Wolff RF, Deshpande S, et al. Cannabinoids for Medical Use: A Systematic Review and Meta-analysis. Jama. Jun 23-30 2015;313(24):2456-2473.

19. Brugliera L, Spina A, Castellazzi P, et al. Rehabilitation of COVID-19 patients. J Rehabil Med. Apr 15 2020;52(4):jrm00046.