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Case Report

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Lidocaine Infusion in Failed Back Surgery Syndrome Provides a Benefit of Unknown Duration in The Setting of Concurrent Sub-Therapeutic Ketamine Infusion: A Case Report

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Abstract

***Objective**: Benefits of Lidocaine infusions are only known in a few types of surgery. We present the case of a patient with failed back surgery syndrome benefitting from a combination of intravenous lidocaine and ketamine.*

***Case report:** Failed back surgery syndrome is one of the most encountered conditions faced by the pain specialist. We report the case of a patient with failed back surgery syndrome resistant to conventional therapy, responding well to a combination of low dose lidocaine and ketamine infusion, after a ketamine infusion alone didn't bring any relief.*

***Conclusion:** The combination of lidocaine and ketamine infusion in the treatment of failed back surgery syndrome seems to be promising and needs further investigation.*

Keywords: Neuropathic Pain, Ketamine, Lidocaine, Failed Back Surgery Syndrome.

Introduction

Failed back surgery syndrome (FBSS) remains a challenge for the physician specialized in pain management. It is a frequently encountered disease entity following lumbar spine surgery. The exact mechanism leading to chronic pain remains unknown [1]. Recent literature regarding ketamine infusion shows some benefits in the treatment of neuropathic pain [2].

Lidocaine has been known to have analgesic properties since 1961. Its intravenous use in a perioperative setting has increased over the last few years [3]. We report the case of a 51 year-old male who had three ketamine infusions at approximately one month interval. The second and third one were associated with lidocaine. We obtained the written consent of the patient permitting the publication of this case report based on his medical data.

Case Description

A 51 year-old, 84 kg, male patient developed a lumbago in 2009. An initial CT–scan showed a synovial cyst left side of the L4-L5 articulation. The patient consulted a neurosurgeon and was operated twice over the period of 2010-2011. Before both surgeries, the patient's quality of life on the quality of life scale (QOLS) was estimated at 7/10 (10/10 being the best quality of life possible; 0/10 being the worst).

Despite both surgeries, the patient continued suffering from lower back pain and lower limb radiculopathy. The patient described the pain as a burning sensation and an electrical current. An EMG (electromyography) showed a nerve injury present at L5. In 2011, the patient was referred to the multi-disciplinary pain clinic of the Erasme hospital, Brussels. At the time, the patient was taking pregabaline (300mg/ day) and oxycodone (30mg/ day). As part of a multidisciplinary approach, the patient was continuously evaluated by a physiotherapist, a psychologist, a neurologist, a pain nurse, a psychiatrist and an anesthesiologist.

The gradual addition of duloxetine for neuropathic pain and NSAIDS for inflammatory pain didn't bring any pain relief. Opioid patches were added to the pain treatment. Opioid rotation was done once tolerance was developed. The pain however was never fully controlled. Repeated medial branch blocks and thermocoagulation/radiofrequency were done over the course of four years. These techniques provided brief pain relief with no long term benefit. At the same time, the patient described a severe impact on his social and professional life with a quality of life regressing to 0/10. Accordingly, the patient developed a chronic depression, which was managed by psychiatrists.

Alongside, the patient tried out alternative techniques (hypnosis, acupuncture,…). The patient was able to reduce opioid quantity through inhaled tetrahydrocannabinol. Despite of all these different treatments methods, the patient continued to suffer. We proposed

an intravenous ketamine infusion end of 2016. The patient was instructed to fast before presenting himself at our one-day surgery center. Prior to and during ketamine infusion, the patient was monitored (SPO2, ECG, NIBP, oxygen via nasal canula) and a 20G venous catheter was inserted in the antecubital area.

Three mg of IV midazolam was administered, before a ketamine infusion (0.15 mg kg-1 h-1 over 4 hour) was started. The patient didn't encounter any side-effects from ketamine infusion. However, when the patient went back home, he didn't feel any difference neither in terms of pain intensity nor in terms of quality of life. Another ketamine infusion was done six weeks later the exact same way with the addition of lidocaine (1 mg kg-1 h-1). During the infusion time, NRS (numeric rating scale) scores were rated by the patient as 0/10. When the patient went home, this time, he immediately felt a difference in terms of quality of life and pain intensity. A third ketamine infusion was programmed two weeks after the second one to reinforce the positive effect. This time, ketamine was administered at a rate of 0.3 mg kg-1 h-1 over 4 hours as well as lidocaine (1 mg kg-1 h-1). The patient rated his pain at 0/10 on the NRS scale during the infusion and didn't encounter any side-effects.

Interestingly, the effect of the last two infusions has lasted for several weeks. After the last infusion, the patient was re-evaluated multiple times at our pain clinic. He described less pain and for the first time in eight years the patient felt a real psychological and social improvement regarding his day-to-day life. He was able to reduce daily opioid and benzodiazepines dosage. He currently judges his pain score as 3/10 on the NRS and his quality of life as 7/10 on the QOLS.

Discussion

We report the case of a possible treatment of failed back surgery syndrome with ketamine and lidocaine. Ketamine, a unique well-rounded drug, is a dissociative anesthetic with analgesic properties. It is the most potent NMDA-receptor-blocker available for clinical use and is as well a producer of modulatory effects on ascending and descending nociceptive transmission [4-7]. In this complex case, we observed the benefits of the cerebral plasticity that ketamine is capable of when it comes to pain pathways. Another interesting benefit of ketamine well observed in this case is its anti-depressant properties [8]. The patient described an overall wellbeing and improved moral.

Recent literature has shown benefits of a ketamine infusion regarding the treatment of neuropathic pain. A higher dose infused over a longer period of time seems to be able to provide better pain relief [2]. In this case, however, a low dose of ketamine was administered over a four hour period three times over two months. Lidocaine was added the second and third time. The benefits of lidocaine infusion are only well documented in a few types of surgeries [3]. Perioperative intravenous lidocaine and its analgesic, anti-inflammatory, anti-hyperalgesic properties are well known to the anesthesiologist, even though the exact mechanisms are not yet fully understood [9,10]. In this case, the patient described a benefit only after lidocaine was added. To our knowledge, this is the first time lidocaine was added to ketamine infusion in the treatment of neuropathic pain. However, the exact dose of ketamine and lidocaine to be administered as well as the duration of infusion and the administration regime remain a mystery. It may even be possible that the dose of 0.15 mg kg-1 h-1 of ketamine was not really enough to expect any benefit after the first infusion, even though the patient reported a benefit only after lidocaine was added.

Conclusion

We report the case of a patient with failed back surgery syndrome seemingly benefiting from the combination of lidocaine and ketamine infusion. Other studies need to be conducted to evaluate the additive/synergic effect of the combination of ketamine and lidocaine infusion.

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