INTRAMUSCULAR (IM) KETAMINE FOR TREATING MIGRAINE AND NEUROPATHIC PAIN IN THE CLINIC

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Objects/rationale

Ketamine is a potentially useful agent for the treatment of neuropathic pain. It has a very specific pharmacology namely, that of NMDA glutamate receptor blockade. Although most of the existing literature and pain management has utilized intravenous ketamine, there may be a need, in certain clinical situations, for using this agent intramuscularly. For example, some patients are not amenable to intravenous line placement, or their severe symptoms demand a more rapid treatment strategy. For both reasons, we chose to study our own headache and pain patients in an outpatient setting using intramuscular (IM) ketamine. Our primary objective was reduction of pain and headache score from 5 to 10 to 0-4. We also studied the side effects and tolerability of IM ketamine, as very little information exists on the use of this medication intramuscularly.

Methods

We studied 17 patients (12 female, 5 male) who came to the clinic for refractory pain and headache symptoms. In all instances, pulse oximetry monitoring was used throughout the treatment with ketamine. The patient’s weight was converted to kilograms. 0.3-0.4 mg per kilogram of ketamine was drawn into a syringe. The dose was injected in three to five parts intramuscularly, with 10 to 15 minutes between injections. The patient rated their pain and headache score on a 0-10 VAS and numeric rating score every 15 minutes. 1 patient received 11 injections for frequent refractory migraines.

Results

The average pain score prior to treatment was 8.6/10 and this was reduced to 2.7/10 after treatment. (See figure 1) the results were statistically significant, via 2-tailed t test, F < .001. The average dose of ketamine was 68.3 mg. Patients who might otherwise not tolerate IV line placement or having very severe symptoms were delighted at the ease of treatment and rapidity of results with IM ketamine.

No patient fell asleep during treatment, nor were there any instances of hallucinations or emergence delirium. 4 patients described a sense of exhilaration or “spaciness” transiently after ketamine was given. In no instance did this side effect persist longer than a few minutes. Only two patients had return of symptoms to prior severity 24 hours after treatment with IM ketamine. Both patients returned for repeat treatment, again with success.

Conclusions

We conclude the use of intramuscular (IM) ketamine can give rapid and sustained pain and headache relief when used in an outpatient setting. It requires monitoring but can be given rapidly with minimal side effects, and is well-tolerated. IM ketamine for treating refractory pain and migraine flareups is a very effective form of treatment in the outpatient clinic. IM ketamine should be studied in a double-blind fashion.

Discussion

There is almost no data on the use of IM ketamine to treat pain and headache flareups. Some studies evaluated intramuscular ketamine for emergency room orthopedic procedures, post-thoracotomy pain, thoracic surgery, inguinal hernia repair and tonsillectomies [1-5]. Only two studies evaluated IM ketamine for treating trigeminal neuralgia or neuropathic pain [6-7]. An equally small database for ketamine. Thus, the data is extremely limited in use of intramuscular ketamine. However, in neuropathic pain flareups, we observed a similar efficacy of IM ketamine to reduce both neuropathic pain and refractory migraine headache.

In addition, we treated in an outpatient center, with pulse oximetry monitoring, thus demonstrating ease-of-use and a high efficacy in reducing pain and migraine symptoms. IM ketamine should be studied in a double-blind manner to demonstrate efficacy.

The similar efficacy of IM ketamine to reduce both neuropathic pain and refractory migraine may speak to similar underlying mechanisms. NMDA-glutamate receptor oversensitivity in the nervous system. This mechanism may underlie both refractory migraines and ongoing neuropathic pain. Our results lend support to the hypothesis that glutamate – driven mechanisms play a strong role in migraine and neuropathic pain.

CONCLUSIONS

- IM ketamine reduces refractory migraine and neuropathic pain with efficacy in the clinic
- It is very well tolerated with minimal side effects, but should be monitored with pulse oximetry
- Double-blind studies are warranted for IM ketamine

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