



# Refractory Status Migrainous: Propofol as a Potential Treatment Option: A Case Report

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## Abstract

This case report discusses a 48 year old female presenting with refractory status migrainous who ultimately achieved symptom resolution with the administration of propofol. Although limited evidence exists in the literature, propofol may have a utility in treating a disease process that contributes a significant financial burden and consumption of health care resources.

## Introduction

Migraine headaches are a common ailment among the general population and create significant disability and utilization of health care resources. A variety of pharmacodynamic targets have been identified for treatments yet an estimated 5.1% of Migraine Headaches (MHA) is refractory to treatment [1].

## Case Presentation

The patient is a 48 year old female with an extensive history of refractory MHA. Six months prior, she was treated with dihydroergotamine (DHE) administration without relief. Next, she was administered 200 mg of propofol (2.5 mg/kg) under anesthesia supervision with immediate resolution of symptoms in the recovery room. She remained symptom free for approximately one month whence her symptoms gradually returned over the following six months. Ultimately, the debilitating nature of her symptoms required readmission and subsequent diagnosis of status migrainous. She was again treated with DHE therapy unsuccessfully. Her primary neurology team requested assistance from anesthesia to administer propofol in the operating room. She received a total of 200mg of propofol titrated to a Ramsay sedation score of 4-5. The procedure lasted 32 minutes. Immediately following emergence she reported a pain score of 0/10 from her previous score of 10/10. She was monitored in the recovery room and discharged home. One month following discharge, she reported minimal symptoms with the ability to resume her activities of daily living.

## Discussion

Headaches are among the most common diagnoses in the field of neurology. Headaches are characterized by their chronicity and pathology. The underlying causes are classified as primary versus secondary. Secondary headaches are less prevalent and cures usually are accomplished by treating the underlying pathology. Primary headaches include tension, cluster and migraine headaches. The International Headache Society estimates that 6% and 15-18% of men and women, respectively, with an age range from 25-55 years suffer from migraine headaches. Current recommended treatment options include non-pharmacologic and pharmacological methods. Non-pharmacological recommendations include stress management, physical therapy, regular exercise, and biofeedback. Pharmacological options span the spectrum of analgesics. In this case report, we show that propofol may be a viable alternative in the treatment of migraine headaches. The complex pathogenesis of migraine headaches has made it difficult to develop effective treatment options. The mechanism by which propofol may improve migraines is not entirely clear although propofol has been investigated as a treatment modality for refractory MHA [2,3]. However, the data are largely based on case reports and no double-blinded randomized controlled trials exist. There are several pharmacodynamic properties of propofol that would be theoretically advantageous. For example, GABA receptors have been implicated in the pathogenesis of migraines [4] and propofol's effects on GABA may be the source of its therapeutic effect [3]. Also, propofol's stimulation of nitric

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Received Date: 25 Nov 2017

Accepted Date: 01 Feb 2018

Published Date: 15 Feb 2018

### Citation:

Sheahan CG, Farhang B, Boyer E, Anderson EP, Viscomi CM, Tsai MH. Refractory Status Migrainous: Propofol as a Potential Treatment Option: A Case Report. *Annals Pain Med.* 2018; 1(1): 1003.

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oxide production and inhibitory effect on calcium channels may lead to vasodilation and vasoconstriction, respectively. Here, propofol modulating the vasoconstricting effects of catecholamines may also play a role [5]. From a societal perspective, the treatment of migraine headaches creates considerable direct and indirect costs. Direct costs include the health care visits, consultations, and drug costs. Indirect costs are usually measured in sick days and early retirement from the workforce. In Germany, where the total costs of headache treatment is estimated to be 5 billion Euros per year, the West German Headache Center created a multi-disciplinary integrated approach to the treatment of headaches. They stratified patients to increasingly intensive levels of care, from the initial assessment and outpatient treatment. Inpatient admissions were reserved for patients with refractory symptoms [6]. The treatment of refractory migraine headaches with propofol may represent an opportunity to conserve health care resources. For these patients, treatment can be established in the emergency room or outpatient setting. Again, future studies are certainly warranted.

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