

Abstract

Purpose:

Ketorolac tromethamine is a non-steroidal anti-inflammatory drug (NSAID) that exhibits antipyretic, analgesic, and anti-inflammatory effects. Previous research suggests that ketorolac, regardless of administration route, has an analgesic ceiling effect at 10 milligrams (mg) and doses that exceed that do not offer any further analgesic benefit while potentially subjecting the patient to a higher risk of adverse effects. The primary objective was to evaluate the frequency of which ketorolac was prescribed at doses above the suggested 10 mg analgesic ceiling dose. The secondary objectives included the indication for ketorolac use, evaluation of pain scores while using ketorolac, first pain medication administered, concurrent analgesics, duration of ketorolac use, and discharge pain medication. The results of this study can play a role in ensuring safe and effective use of ketorolac as well as having the potential to change current prescribing practices.

Methods:

This study was a single center retrospective review of ketorolac usage amongst patients admitted to the internal medicine unit. This study was approved by the Springfield Committee for Research Involving Human Subjects Institutional Review Board. Data was collected from patients' electronic health records and was analyzed with descriptive statistics. To be included, patients had to meet the following requirements: 18-89 years old, admitted to the academic medical center between January 1, 2018 and June 30, 2019 and received at least 1 dose of ketorolac. Patients were excluded if ketorolac was used for postoperative pain or hospital stay was less than 23 hours.

Results:

A total of 109 patients met inclusion criteria and were included for analysis. Amongst those patients there were 260 ketorolac administrations documented, of which 213 were given intravenously, 40 orally, and 7 intramuscularly. Of those administrations, 205/213 intravenous doses (96%), 0/40 oral doses (0%), and 7/7 intramuscular doses (100%) were above the suggestive 10 mg analgesic ceiling dose. The most common indication for ketorolac orders were abdominal pain (n=23,21%), chest pain (n=21,19%), and headache (n=10,9%). The mean pain scores before and after ketorolac administration, respectively, were 8 and 5 for the 10 mg oral doses (n=23), 7.5 and 5.6 for the 15 mg IV doses (n=55), and 8.1 and 6 for the 30 mg IV dose (n=68). Ketorolac was the first analgesic administered in 58 patients (53%). Additional pain medications were administered in 99 patients (91%) within 24 hours of a ketorolac dose being given. Two patients (2%) of the study population exceeded the five-day maximum duration. While 51 patients did not receive any pain prescriptions post-discharge, hydrocodone-acetaminophen was the most frequently ordered analgesic upon discharge (n=11,10%).

Conclusions:

Although data suggests that ketorolac exhibits an analgesic ceiling dose effect, prescribers continue to order doses above 10 mg. Prescriber education and a motion to implement a dose cap for ketorolac is warranted at the institution.