Title:

Effects of aprepitant on post-operative nausea and vomiting in patients undergoing cardiac surgery or catheterization procedures: A prospective study with subjects as their own historical control

Abstract

Introduction

For a subset of patients undergoing cardiac surgery and catheterization procedures, severe post-operative nausea and vomiting (PONV) occurs despite maximum, standard anti-emetic interventions.

Aprepitant, a neurokinin-1 (NK-1) receptor blocker, is safe and effective at preventing PONV resistant to standard therapies.[1,2] At our institution, this medication is generally limited to oncology patients receiving highly emetogenic chemotherapy and patients undergoing bariatric surgery.[3,4] Its broader use has been limited due to cost.

Hypothesis

Our study evaluated the incidence of PONV and PONV-related complications after administration of pre-operative oral aprepitant to patients with a history of severe PONV undergoing cardiac surgery or catheterization procedures. We hypothesized this patient population would experience less PONV and fewer PONV-related complications after aprepitant treatment compared to their prior anesthetics.

Methods

Patients with a history of severe PONV presenting for cardiac surgery or catheterization procedures from 1/1/2018 to 6/1/2021 were identified. After pharmacist approval, patients received aprepitant pre-operatively (Dose: 80mg for weight>50kg, 40mg for weight 30-50kg). A retrospective chart review was performed. Primary outcomes of the incidence of PONV and PONV-related complications were evaluated with descriptive statistics.

Results

Seventeen patients were included with a mean age of 16.0 years at the time of their initial procedure, which acted as the 'control' procedure, and 17.5 years when they received aprepitant. After the control procedure 73.3% of patients required rescue anti-emetics. When this group of patients received aprepitant pre-operatively at their subsequent procedure, only 18.8% required rescue medication ($p = 0.004$). Similarly, 76.5% of patients suffered at least one PONV-related complication after the control procedure. With aprepitant use pre-operatively, 29.4% of the same patients experienced a PONV-complication ($p = 0.015$). Specifically, unplanned ICU admission due to severe PONV after catheterization procedures decreased from 44.4% (4/9) in the control group to 0 after these patients were treated pre-emptively with aprepitant. ($p=0.02$)

Discussion/Conclusion

Debilitating PONV occurs in some patients despite multiple pre-emptive measures. Cardiac catheterization is associated with unique PONV-related complications: hematoma formation, prolonged "flat time," and bleeding from catheterization sites. Patients undergoing sternotomy for cardiac surgery are at significant risk for PONV due to post-operative narcotic requirements, even with multi-modal pain control strategies. Thus, finding new treatment strategies for PONV in this patient population is important.

Our small study provides insight into the benefit aprepitant can provide to patients at high risk for PONV undergoing cardiac procedures. Given the reduced rate of PONV with we observed with aprepitant use, other markers of post-op recovery can be expected to improve and should be explored. There may be significant cost savings by preventing unplanned ICU

admissions for intractable PONV, which could offset the cost of using aprepitant more widely in this patient population.