

ABSTRACT

Background: Acute asthma (AA) exacerbation is a common reason for Pediatric Emergency Department (PED) visit. Pediatric Asthma Score (PAS) is used in children and adolescents aged 2 to 18 yrs to predict hospital admission and management. PAS is determined by age appropriate respiratory rate, age, oxygen requirements, auscultation, retractions and dyspnea. Studies have shown use of magnesium sulfate (Mg-S) to be safe and effective adjunct treatment with reduced hospital admission and shorter length of stay (LOS). There are no guidelines on when to administer Mg-S for AA.

Objective: To explore if early administration of Mg-S reduces usage of continuous albuterol nebulization (CAN) and LOS.

Design/Methods: Retrospective chart review of children and adolescents aged 2 to 18 yrs with AA exacerbation admitted to Flushing Hospital Medical Center between Jan 2012-Nov 2018. Exclusion criteria included children with cardiopulmonary disease and chronic respiratory disease. Demographic data included age, gender and previous asthma history (PAH). PAS was calculated at 0, 6, 12, 24, 48, 72 hrs and absolute change from 0 hrs to hospital discharge. Data collected include time of first dose of Mg-S, <3 hrs (early) or after 3 hrs (late) determined by arrival to the PED to time of dose, number of CAN and LOS. Data were analyzed using SPSS software, compared by linear regression, p<0.05 was considered significant.

Results: Of 155 charts reviewed, 26 met exclusion criteria. Of remaining 129 charts, 57.4% received early administration (G1) and 42.6% late administration of Mg-S (G2). PAH was none or intermittent in 37.2% and persistent in 62.8%. G1 and G2 were compared for gender (71% vs 59% male), p=0.17, median age (6.1 vs 5.8 yrs), p=0.6, median baseline PAS (9.5 vs 8), p<0.01. Overall PAS decreased over time (F=43.2, p<0.01) with most significant decrease in G1 (F=7.5, p<0.01). Number of CAN as independent variable, G1 vs G2, mean 1.7 vs 3.2 (t=3.5, p<0.01), F=6.2, p<0.01. LOS as independent variable G1 vs G2, median 3 vs 5 days (t=1.9, p=0.05), F=5.9, p<0.01, with variables pneumonia (t=2.6, p<0.01) and PAH (t=2.0, p=0.04), F=5.9, p<0.01. Adverse effect included rash and hypotension, 1.5%.

Conclusion(s): In our small sample, early administration of Mg-S with higher baseline PAS, improved PAS faster, decreased number of CAN and LOS with and without covariables. Mg-S was well tolerated and appeared to be safe.

INTRODUCTION

- Acute asthma (AA) exacerbation is the most common reason for Pediatric Emergency Department (PED) visit.
- Pediatric Asthma Score (PAS) is used between age 2 to 18 years to predict likelihood for hospital admission and management.
- PAS is determined by respiratory rate, age, oxygen requirements, auscultation, retractions and dyspnea.
- Use of magnesium sulfate (Mg-S) has been used as an adjunct mode of therapy. Mechanisms of action of Mg-S include bronchodilation and anti-inflammatory effect.
- Early administration of Mg-S is before 3 hours and late administration of Mg-S is after 3 hours.
- Data on use of Mg-S are sparse and there are no studies on effectiveness of maximum dosage of Mg-S in status asthmaticus.

OBJECTIVE

To explore if early administration of maximum dosage of Mg-S reduces length of hospitalization and usage of continuous albuterol nebulization (CAN).

METHODS

- Design:** Retrospective chart review
- Settings:** Flushing Hospital Medical Center
- IRB:** Approved by Flushing Hospital Medical Center
- Time Frame:** January 2014 and November 2018
- Inclusion criteria:** Children aged 2-18 with acute asthma exacerbation, with and without pneumonia.
- Exclusion criteria:** Children not between 2-18 years, have cardiopulmonary disease, restrictive or chronic respiratory disease
- Statistical analyses:** Microsoft Excel, SPSS software, odds-ratio between the groups, p<0.05 was considered significant

RESULTS

- Charts reviewed:** 129/155 met inclusion criteria
- Group 1 (G1):** 57.4% received Mg-S < 3 hours (early)
Group 2 (G2): 42.6% received Mg-S > 3 hours (late)
- G1 vs G2:** gender (71% vs 59% male), p=0.17
median age (6.1 vs 5.8 years), p=0.6
median baseline PAS (9.5 vs 8), p<0.01
LOS: median 3.8 vs 4.7 days without variables (t=1.9, p=0.05), with variables (F=5.9, p<0.01), figure 1
number of CAN, mean 1.7 vs 3.2 (t=3.5, p<0.01), F=6.2, p<0.01, figure 2
- Decrease of PAS over time:** G1 vs G2, figure 3

Figure 1: Length Of Stay

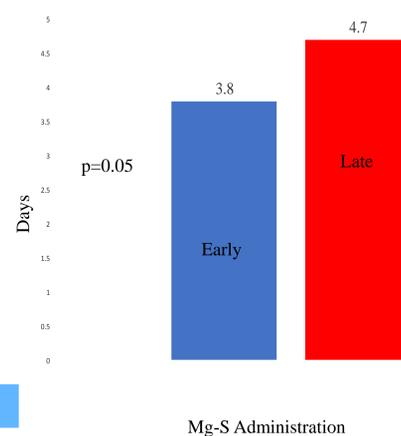


Figure 2: Number of CAN

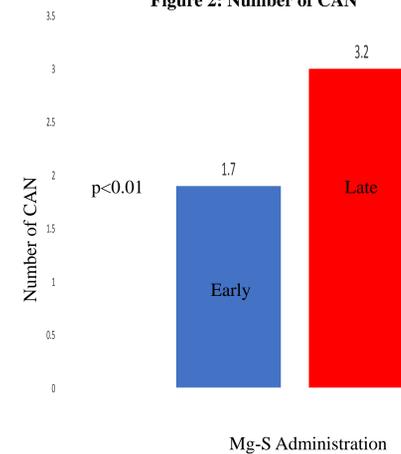
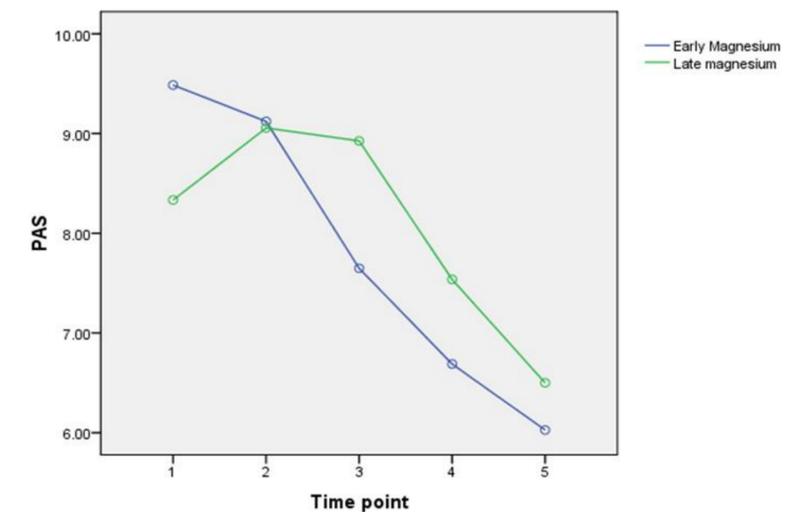


Figure 3: Decrease of PAS over time



CONCLUSIONS

- Early administration of Mg-S with higher baseline PAS improved PAS faster, decreased number of CAN and LOS with and without covariables in our small sample.
- Mg-S was well tolerated and appeared to be safe.

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