



# IMPACT OF DEXAMETHASONE DOSING ON ASTHMA OUTCOMES IN THE PEDIATRIC EMERGENCY DEPARTMENT

Yi Sun, BSc(Pharm); Jennifer Kendrick BSc(Pharm), PharmD, ACPR; Simi Khangura, MD; Kathryn Haubrich BSc(Pharm), PharmD

## Background

- Asthma is a common childhood disease
- Canadian Pediatric Society recommends oral corticosteroids for moderate to severe asthma exacerbations
- Systemic corticosteroids reduce the rate of hospitalizations, rate of relapse, and amount of  $\beta$ -agonist needed
- Dexamethasone is the oral corticosteroid of choice in the emergency department (ED) at BC Children's Hospital
- The dosing of dexamethasone in the ED has recently changed
- The objective of this study is to compare the safety and efficacy of these two dosing regimens

## Methods

- Design:** Pilot retrospective cohort study
- Visit dates:** Index ED visit between:
  - November 1, 2014 and May 31, 2015
  - November 1, 2015 and May 31, 2016
- Primary Outcome:** Rate of ED revisits within 10 days of the index asthma exacerbation
- Secondary Outcomes:**
  - Rate of hospitalizations for asthma
  - Time until PRAM < 4
  - Length of stay in the ED
  - Management of acute asthma in the ED
  - Type and incidence of adverse events due to dexamethasone
- Inclusion Criteria:**
  - Age: 1-16 years
  - Physician diagnosed asthma, or history of  $\geq 2$  viral wheezing episodes, bronchodilator responsive
  - Prescribed 3 doses of 0.3 mg/kg/dose or 1 dose of 0.6 mg/kg/dose of oral dexamethasone in the ED
- Exclusion Criteria:**
  - Oral corticosteroids in the previous 4 weeks
  - Concurrent pneumonia
  - History of CF or congenital heart disease
- Record Selection:**
  - 244 records screened, 21 duplicates removed, 57 did not meet inclusion, 26 records excluded, 140 records included

Table 1: Baseline Characteristics

Patient Characteristics	0.3 mg/kg/dose N=78 (%)	0.6 mg/kg/dose N=62 (%)
Age (yrs) – median (range)	5 (1-16)	4 (1-15)
Males	60 (77)	40 (65)
Median RR - bpm (range)	30 (16-64) (N=73)	34 (16-70) (N=62)
Tachypneic	47 (64)	25 (40)
Median O <sub>2</sub> Sat – % (range)	98 (92-100) (N=76)	96.5 (83-100) (N=62)
Median PRAM score (range)	5 (1-10) (N=66)	5 (0 -10) (N=58)
Mild	7 (11)	12 (21)
Moderate	51 (77)	38 (65)
Severe	8 (12)	8 (14)
ED visit for asthma in last 12 months	21 (27)	16 (26)
Previous hospital admission for asthma	11 (14)	9* (15)
<b>Home Medications</b>		
Salbutamol	48 (62)	37 (60)
ICS	33 (42)	21 (34)
Other	9 (12)	7 (11)

\* 1 patient was previously admitted to PICU for asthma exacerbation

Figure 1: Rate of ED Revisit Within 10 Days

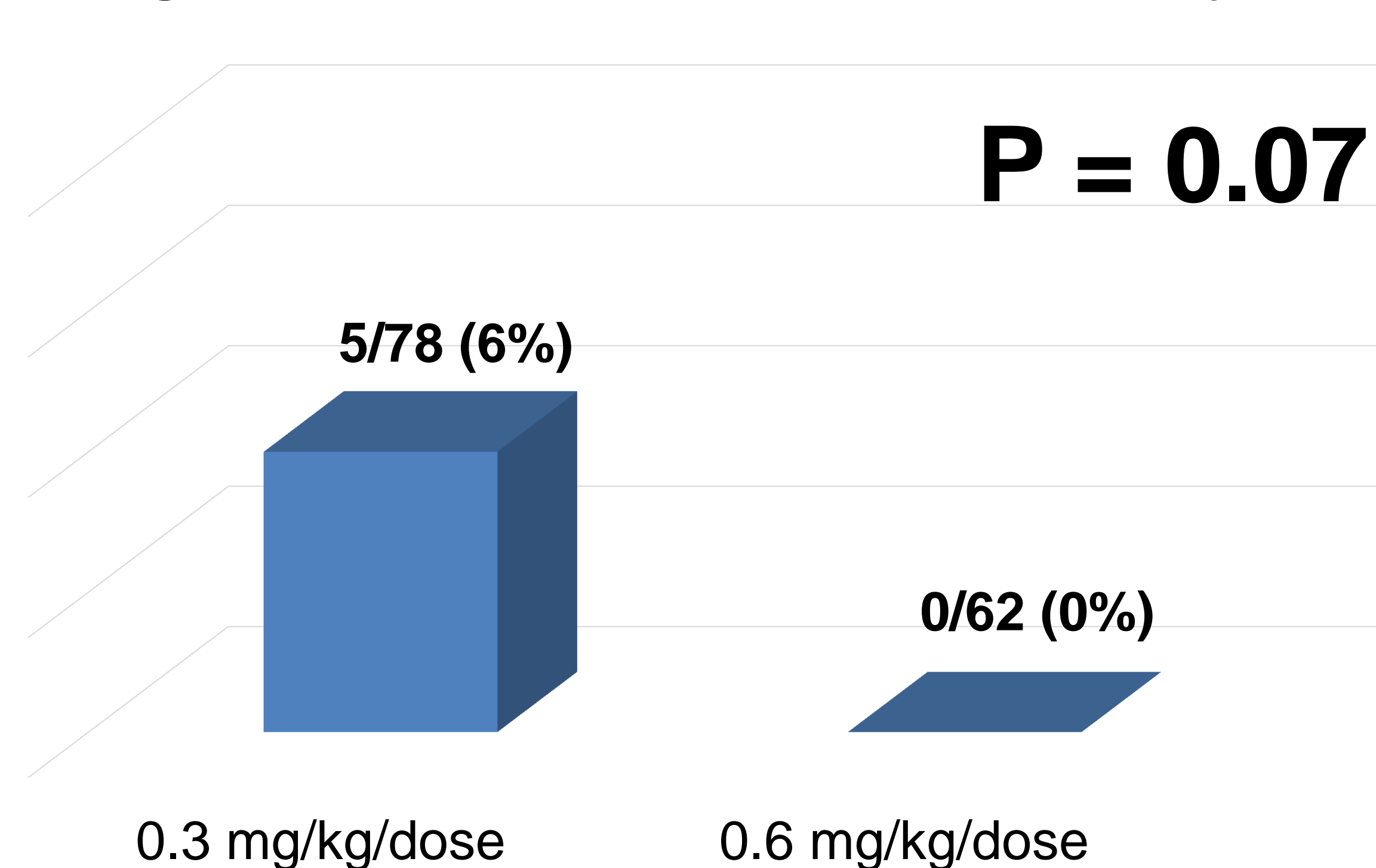


Figure 2: Rate of Vomiting

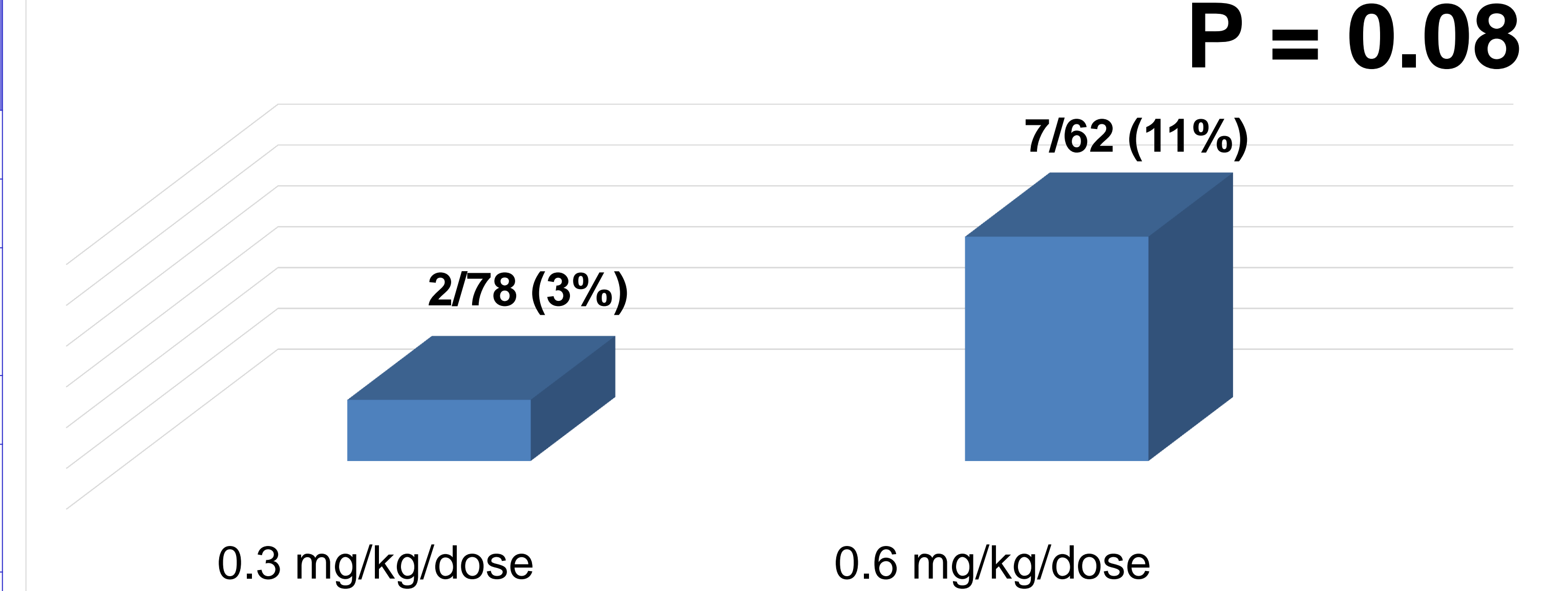


Table 2: Secondary Outcomes

Endpoint	0.3 mg/kg/dose N=78 (%)	0.6 mg/kg/dose N=62 (%)
Back-to-back ipratropium	66 (85)	54 (87)
Rounds of salbutamol – median (range)	3 (1-10)	4 (1-14)
IV methylprednisolone	0	1 (2)
IV magnesium sulfate	0	3 (5)
Oxygen	0	2 (3)
Time (hrs) until dexamethasone administered – mean $\pm$ SD	1.79 $\pm$ 1.18	1.84 $\pm$ 1.12
Time (hrs) until PRAM < 4 – mean $\pm$ SD	2.69 $\pm$ 2.05	2.33 $\pm$ 2.43
ED length of stay (hrs) – mean $\pm$ SD	4.86 $\pm$ 2.50	7.04 $\pm$ 3.32
PRAM on discharge – median (range)	2 (0-4)	2 (0-5)
Discharge prescription for salbutamol – no. (%)	75 (96)	59 (95)
Discharge prescription for ICS	41 (53)	47 (76)
Discharge prescription for other asthma medication	3 (4)	6 (10)
Admitted to hospital ward	0	1 (2)

## Limitations

- Retrospective cohort design with small sample size
- Potential confounding due to season and year
- Does not capture visits and admissions to other hospitals

## Conclusions

- Similar rates of ED revisits and vomiting with both dosing regimens

