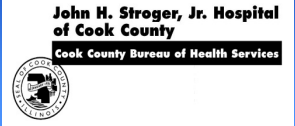


# Title: Beta Agonist use without Concomitant Inhaled steroids is not Associated with Exacerbations in an Inner City Community-Based Cohort



R. Kumar, MD<sup>1</sup>, A. Evans MD<sup>2</sup>, J. Shannon MD<sup>2</sup>, L. Stierman MS<sup>3</sup>, C.A. Saltoun MD<sup>3</sup>, L.C. Grammer MD<sup>3</sup>, R. Durazo-Arvizu, PhD<sup>4</sup>, and K.B. Weiss, MD, MS<sup>3,5</sup>. <sup>1</sup>Childrens Memorial Hospital, Chicago, IL, United States; <sup>2</sup>John H Stroger Cook County Hospital, Chicago, IL, United States; <sup>3</sup>Northwestern University Feinberg School of Medicine, Chicago, IL, United States; <sup>4</sup>Loyola University Stritch School of Medicine, Chicago, IL, United States; and <sup>5</sup>Hines VA Hospital, Chicago, IL, United States.



## Abstract (Poster revision - full data set findings)

**Rationale:** We wanted to determine the relationship between beta agonist use without a concomitant inhaled steroid and severe exacerbations in a community based sample of persons with asthma. **Methods:** This is a cross-sectional multivariate analysis from the Chicago Initiative to Raise Asthma Health Equity, a community-derived asthma cohort of children (aged 8 to 14 years, n=561), and adults (aged 18-43, n=353). Cases used a beta agonist but no inhaled steroid. Control subjects were on an inhaled steroid. The primary outcome was asthma exacerbation status as defined by either a hospitalization or an ED visit and more than one oral steroid course in the last year. Covariates included age, sex, socioeconomic status, tobacco exposure, atopy, and baseline FEV1. **Results:** In adults, steroid bursts, ED visits, and admissions occurred in 71.9%, 40.5%, and 13% of subjects respectively. In children, the proportions were 72.8%, 39.7%, and 10.7 % respectively. Multivariate analyses found no association between use of a beta agonist alone and exacerbations. In children, there was a trend towards significance with chi-squared values of 2.03 and 1.57 for analyses stratified by Fev1 <80% and >80% respectively (NS p=0.15 and 0.2). **Conclusions:** In this community based sample of persons with asthma, there was no association between asthma exacerbations and beta agonist use without a concomitant inhaled steroids.

Funded By: NIH/NHLBI:U01 HL072478-03

## Background

### Inner city minority populations:

- experience greater morbidity and mortality from asthma;
- preferentially use beta agonists without inhaled corticosteroids (ICS)
- have higher prevalence of beta receptor polymorphisms, which can increase the risk of bad asthma outcomes with regular use of beta agonists.

### Hypothesis:

Beta-agonist use by itself will be associated with worse asthma outcomes in a community derived urban cohort.

## Objectives

**Primary:** Determine if use of beta agonist without ICS is associated with more asthma exacerbations requiring urgent care in this diverse, inner city population.

**Secondary:** Determine if the use of beta agonists without ICS is associated with worse symptom burden or asthma quality of life.

## Materials and Methods

- Prospective cohort study of inner city Chicago children and adults followed for 3 months.
- Population-based sample using school-based screening.
- Children: 8 -14 yrs
- Adults: 18 - 40 yrs
- Physician-diagnosis of asthma and use of asthma medication at least 8 weeks in the prior year.

## Materials and Methods (cont.)

- N = 242 children and 229 adults
- **Comparison groups:** B-agonist + ICS vs. B-agonist only
- **Primary outcome:** Number of severe asthma exacerbations requiring urgent outpatient care or hospitalization during 3 months follow-up.

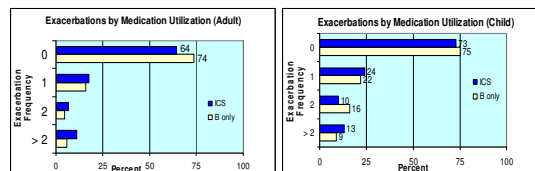
Baseline asthma medications	Subjects n (%)	
	adults	children
B-agonist only	109 (47.6)	122(50.4)
B-agonist + ICS	120 (52.4)	120(49.6)

- **Control variables** in multivariable model: demographic variables (age, sex, ethnic group), SES (income, education, insurance), smoking, allergen sensitization (dust, roach), baseline spirometry, baseline disease severity (symptom freq, asthma Quality of Life (QOL), number of severe exacerbations and hospitalizations over past year).
- **Secondary outcomes:** symptom frequency and asthma QOL at 3-month follow-up.

## Results

DEMOGRAPHIC CHARACTERISTICS OF SAMPLE			
CHILDREN (N=242)		ADULTS (N=229)	
AGE (y) MEAN(SD)	10.7 (1.8)	AGE (y) MEAN(SD)	31.8 (5.6)
SEX (% F)	40.1	SEX (F%)	77.5
RACE (%)		RACE (%)	
HISPANIC	27.3	HISPANIC	32.2
AFRICAN AMERICAN		AFRICAN AMERICAN	
NON-HISPANIC	55.8	NON-HISPANIC	53.7
Other	16.9	WHITE	14.1
HOUSEHOLD INCOME n(%)		HOUSEHOLD INCOME n(%)	
<\$30,000/yr	109(45)	<\$30000/YEAR	106(46.3)
>\$30,000/yr	133(55)	>\$30000	123(53.7)
CAREGIVER EDUCATION n (%)		EDUCATION n (%)	
< HIGHSCHOOL	33(13.6)	< HIGHSCHOOL	30(13.2)
HIGHSCHOOL	159(65.7)	HIGHSCHOOL	153(67)
> HIGHSCHOOL	50(20.7)	> HIGHSCHOOL	45(19.8)
#urgent/ ED visits Mean(SD)	2.58(4.74)	#urgent/ ED visits Mean(SD)	2.05(3.41)
% hospitalized (12 mo)	9.9	% hospitalized (12 mo)	12.8
Private Ins (%)	50.4	Private Ins (%)	53.3
FEV1 (%pred.) mean(SD)	97.1(15.4)	FEV1 (%pred.) mean (SD)	86.9(18.3)

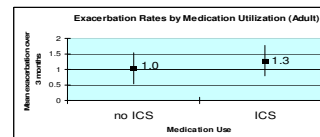
### Severe Exacerbations Requiring Urgent Care – crude unadjusted frequencies (not controlled for any other variable)



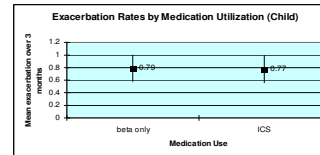
## Results (continued)

### PRIMARY ANALYSIS:

- Severe exacerbations requiring urgent outpatient care:
- **Multivariate:**
- Adults – no association with medication utilization pattern (p=0.25)



- Children – no association with medication utilization pattern (p=0.68)



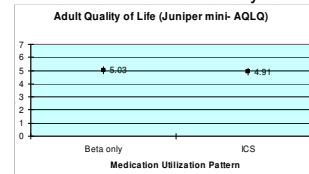
### Hospitalization:

Adults and Children – No association with Medication Utilization on logistic regression models including all significant covariates (symptoms, Quality of Life, prior hospitalization, and baseline FEV1)

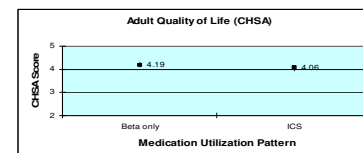
- Adults beta only 2% vs. ICS 3.3% (p=0.55)
- Children beta only 6.6% vs. ICS 13.3 % (p=0.08)

### SECONDARY ANALYSIS

- **Asthma Specific Quality of Life**
- Adults- no association with Quality of Life (p=0.28)



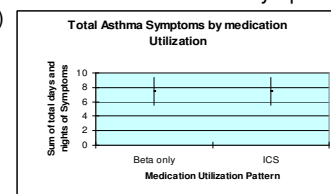
- Children (adapted from Children's Health Survey for Asthma instrument with intact scales for the "activities of the family" and "child emotional health") – no association with Quality of Life (p=0.17)



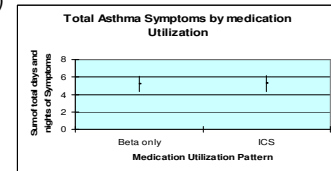
## Results (continued)

### Secondary Analyses (Cont.):

- **Total Symptoms (Days and Nights over last 14 days)**
- **Adults** – no association with total symptom burden (p=0.97)



- **Children** - no association with total symptom burden (p=0.65)



## Summary

1. Use of B-agonist alone (compared to B-agonist+ICS):
  - was **not** associated with a greater number of severe asthma exacerbations;
  - was **not** associated with worse asthma control (symptom frequency); and
  - was **not** associated with worse quality of life.
2. Results are unexpected and contrary to genotype stratified randomized clinical trials.
3. Possible reasons for these unexpected results:
  - residual confounding (unable to fully account for severity of underlying disease using control variables);
  - poor adherence or poor technique with ICS;
  - sample with predominantly mild disease;
  - self-titration of medication use to achieve tolerable, but not good, asthma control.
4. Findings may change if groups were stratified by beta receptor haplotypes.

References available upon request.

•Funding Source: NHLBI grant 1U01 HL072496-04