

# Effects of inhaled corticosteroids and montelukast on growth and body mass index in children with asthma

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**Introduction and objectives:** Inhaled corticosteroids (ICS) and montelukast are commonly prescribed drugs in asthma treatment. Several studies have investigated the adverse effects of ICS on growth and weight gain in children. However, the biosafety studies of montelukast are mostly focused on the neuropsychiatric side effects. The present study aimed at investigating the adverse effects of montelukast and commonly used ICS on anthropometric parameters in children.

**Methods:** The present study used a retrospective cohort design of 175 children with asthma in three treatment groups including budesonide, fluticasone propionate, and montelukast sodium. Children who were admitted to the outpatient department (OPD) with allergic symptoms other than asthma were demarked as a control group. All subjects had at least two clinical visits within a 12-month interval. The daily steroid dosage was calculated individually for each patient. The details of skin prick test results, cumulative dose, and type of medication, anthropometric parameters including height, weight, body mass index (BMI) in both the visits, were obtained from medical records of the patients.

## Results:

Table 1. Characteristics of patients

	Asthmatic patients			Control group
	Budesonide N=53	Fluticasone N=81	Montelukast N=41	N=77
Age (yr)*	8.7 ± 2.7	9.2 ± 3.0	9.9 ± 3.0	8.5 ± 2.5
Male Gender (%)*	28 (52.8)	49 (60.4)	23 (56.0)	44 (57.1)
Rhinitis (%)*	18 (33.9)	21 (25.9)	12 (29.2)	26 (33.7)
Atopy (%)*	32 (60.3)	52 (64.1)	23 (56.0)	42 (54.5)
Drug Dose*				
Low (%)	13 (24.5)	22 (27.1)		
Medium (%)	39 (73.5)	57 (70.4)		
High (%)	1 (1.8)	2 (2.4)		

Data are presented as frequency (percentage) or mean ± SD.

\*There were no significant difference between groups.

Table 3. Correlation analysis of difference between first and last visits of anthropometric parameters and daily doses of inhaled corticosteroids in the study group.

	r	Fluticasone Dose	Budesonide Dose
Δ Height SDS*		-0.286	-0.264
	p	0.14	0.03
Δ Weight SDS*		0.165	0.178
	p	0.11	0.18
Δ BMI SDS*		0.210	0.251
	p	0.14	0.11

BMI, body mass index; SDS, standart deviation score; Δ, difference between last visit and first visit.

Table 2. Clinical findings of the study groups

	Patients with asthma			Control group
	Budesonide N=53	Fluticasone N=81	Montelukast N=41	N=77
<b>First visit</b>				
Height SDS*	0.44 ± 0.9	0.50 ± 1.1	0.36 ± 1.1	0.58 ± 1.0
Weight SDS*	0.44 ± 0.9	0.67 ± 1.1	0.27 ± 0.9	0.53 ± 1.3
BMI SDS*	0.31 ± 1.0	0.57 ± 1.7	0.23 ± 0.8	0.35 ± 1.5
<b>Last visit</b>				
Height SDS*	0.48 ± 0.8	0.40 ± 1.1	0.40 ± 0.9	0.57 ± 0.9
Weight SDS*	0.53 ± 1.0	0.59 ± 1.2	0.26 ± 0.9	0.63 ± 1.3
BMI SDS*	0.36 ± 1.0	0.52 ± 1.1	0.21 ± 0.8	0.44 ± 1.4
<b>Difference of visits</b>				
Δ Height SDS*	0.04 ± 0.6	-0.09 ± 0.5	0.04 ± 0.5	0 ± 0.4
Δ Weight SDS*	0.09 ± 0.5	-0.07 ± 0.4	-0.01 ± 0.4	0.09 ± 0.4
Δ BMI SDS*	0.05 ± 0.3	-0.05 ± 1.1	-0.02 ± 0.3	0.09 ± 0.5

BMI, body mass index; SDS, standart deviation score; Δ, difference between last visit and first visit. Data are presented as mean ± SD. \*There were no significant difference between groups.

**Conclusion:** Commonly prescribed doses of inhaled steroids and montelukast sodium are safe and do not affect BMI and growth in asthmatic children.

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