

# Is there any day variability of respiratory function and airway inflammation in children with mild asthma?

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## INTRODUCTION

Pulmonary function (PF) presents a circadian rhythm with a maximum in the afternoon and a minimum in the early morning. It has been proposed that only patients with a severe asthma have inflammatory changes associated with a circadian PF since circadian inflammatory changes have not well documented in subjects with milder disease.

## METHODS

19 children ( $10,26 \pm 2,18$  y) with mild asthma, as GINA guidelines, were evaluated with spirometry and exhaled nitric oxide (ENO) at 9am, 2pm and 9pm for 3 consecutive days. Each patient, at the beginning of the study, was tested for exercise induced asthma as measure of bronchial hyperactivity (BHR).

## RESULTS

| FRT CHILDREN NO EIA*   | 9 a.m.       | 14 p.m.      | 9 p.m.       | P*   |
|------------------------|--------------|--------------|--------------|--|
| FVC                    | 106.5±17.64  | 104.07±16.21 | 103.44±16.59 | n.s.   |
| FEV <sub>1</sub>       | 104.04±12.83 | 102.99±13.45 | 101.44±17.03 | n.s.   |
| PEF                    | 319.76±80.09 | 323.62±75.63 | 325.27±75.36 | n.s.   |
| FEF <sub>25-75</sub>   | 104.56±26.35 | 107.76±28.44 | 111.27±34.91 | n.s.   |
| FRT CHILDREN WITH EIA* | 9 a.m.       | 14 p.m.      | 9 p.m.       | P*   |
| FVC                    | 111.47±19.67 | 108.72±18.28 | 108.17±19.08 | n.s.   |
| FEV <sub>1</sub>       | 107.61±14.36 | 105.55±13.15 | 103.37±15.59 | n.s.   |
| PEF                    | 320.15±73.0  | 322.25±67.94 | 320.18±70.76 | n.s.   |
| FEF <sub>25-75</sub>   | 103.81±23.72 | 105.30±27.55 | 106.54±34.04 | n.s.   |
| Exhaled Nitric Oxide   | 9 a.m.       | 14 p.m.      | 9 p.m.       | P  |
| Children with EIA      | 16.46±10.52  | 18.25±10.87  | 13.97±8.48   | n.s.   |
| Children without EIA   | 23.58±18.26  | 24.8±16.55   | 20.05±12.7   | n.s.   |
| Total children         | 17.95±12.27  | 19.63±12.04  | 15.25±9.45   | 0.01 bt 9 am and 14 pm<br>0.0000219 bt 14 and 9 pm |

In children with mild asthma, no day circadian variability of PF was found either in the group with BHR or in that without BHR.

In all patients we found a significant variability of ENO with the nadir in the evening (ENO:  $15,25 \pm 9,45$  ppb) and the maximum in the afternoon (ENO:  $19,63 \pm 12,04$  ppb;  $p=0,0000219$ ).

Mean values of ENO in the group with BHR were higher than in the group without BHR ( $22,81 \pm 14,63$  ppb vs  $16,22 \pm 9,94$  ppb; n.s.s. ).

## CONCLUSIONS

Even if more children have to be enrolled to confirm the results, our data suggest that in children with mild asthma there is neither a circadian PF variation nor correlation between PF and airway inflammation (AI) variability.

ENO is a very sensitive index of inflammation that can change after exposure to several factors, such as exercise or smoke. For these reasons, we believe that we have to expect higher variation of ENO to hypothesize any change in AI and a correlation with PF.