

22<sup>nd</sup> annual Congress of the EUROPEAN COLLEGE OF SPORT SCIENCE SPORT SCIENCE IN A METROPOLITAN AREA

5th - 8th July 2017



Ruhr University Bochum, TU Dortmund University and University of Duisburg-Essen

#### EFFECTS OF A 1-WEEK STAY IN THE MOUNTAINS ON 20-M SHUTTLE RUN TEST PERFORMANCE IN CHILDREN WITH ASTHMA

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### Introduction

Key issue of asthma control and management in children

### Unlimited physical activity

#### Exercise induced bronchoconstriction (EIB):

- $\checkmark$  affects up to 80% of children with asthma
- $\checkmark$  influenced by:
  - climatic conditions
  - air quality

Inci D, Guggemheim R, et al., J Clin Med Res. 2017, 9:410-415; Westergren T, Bernsten S, et al., Pediatr Allergy Immunol. 2017, 28:86-92

### Introduction

#### Symptoms of EIB:

- $\checkmark$  cough
- $\checkmark$  wheeze
- $\checkmark$  shortness of breath
- ✓ chest tightness



Inci D, Guggemheim R, et al., J Clin Med Res. 2017, 9:410-415

## Aims

Evaluate **EIB** in a group of children diagnosed with asthma:

- at the start
- at the end

of a 1-week summer camp in the mountains



Fusine (Udine, Italy) - 900 m above sea level

## Activities during the camp



### Methods



# Methods

#### Protocol



## Methods

### Evaluation of the 20mSRT

- number of performed shuttles
- percentile performance

De Miguel-Etayo P, Gracia-Marco L, et al., Int J Obes. 2014, 38:557-66; Tomkinson GR, Lang JJ, et al., Br J Sports Med. 2016 [Epub ahead of print]

### Evaluation of spirometry

- required repeatable flow-volume curve
- spirometry z-scores from GLI-2012 equations Quanjer PH, Stanojevic S, et al., Eur Respir J. 2012, 40:1324-43
- FEV1 decrease ≥10% in either of the post tests = EIB Crapo RO, Casaburi R, et al. Am J Respir Crit Care Med. 2000, 161:309-29

# Results

#### 24 children from an urban area:

- $\checkmark$  age range 7-16 years old
- √ 10 F, 14 M
- ✓ severity of asthma:
  - $\cdot$  16 mild
  - 6 moderate
  - $\cdot$  1 severe

	Average baseline	spirometry
FVC	$2.85\pm0.78~\text{L}$	z-score $0.09\pm0.97$
FEV <sub>1</sub>	$2.48\pm0.74\ L$	z-score $0.10\pm0.95$
FEV <sub>1</sub> /FV	/C 0.87 ± 0.06	z-score -0.02 $\pm$ 1.03



# **Results**



Results



## Conclusions

#### At the end of the summer camp...

The stay in the mountains had likely a positive effect both on the 20mSRT and on the EIB.

- Performances in the 20mSRT were improved
- EIB was reduced, albeit not significantly
- Improvement of the 20mSRT performance concerned in particular children where EIB was reduced

## Acknowledgements

This experimentation was conducted with the unconditioned support of







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Essen, 10.07.2017 - 11:24:48

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This is to certify that the following title has been presented at the 22nd Annual Congress of the European College of Sport Science between 5 - 8 July 2017 in Essen - Germany:

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Abstr.-ID: 620, Presentation format: Oral , Session name: OP-PM57 - Training and exercise in clinical populations 2 Title: EFFECTS OF A 1-WEEK STAY IN THE MOUNTAINS ON 20-M SHUTTLE RUN TEST PERFORMANCE IN CHILDREN WITH ASTHMA Authors: Francescato, M.P., Cettolo, V., Canciani, M. Institution: University of Udine

Presentation date: 07.07.2017, 16:15, Lecture room: Brüssel/West, No: 2

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