

P1197**Chest expansion in school-age children with mild bronchial asthma**Katerina Neumannova¹, Jakub Zatloukal¹, Jana Rydlova², Dana Dvorakova¹.¹Department of Physiotherapy, Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic; ²Miramonti Children's Medical Institution, Luhacovice Spa, a.s., Luhacovice, Czech Republic**Introduction:** The presence of persistent bronchial asthma (BA) is usually connected with limited chest expansion (CE) [1], but there are no reference values to express if there is a serious limitation.**Aims:** To evaluate an effect of a 4-week pulmonary rehabilitation programme (PRP) on CE in school-age children with mild BA.**Methods:** One-hundred-and-fourteen children with BA (aged 12.0±2.6 years) were examined and recruited for the intervention group (I), which attended a 4-week PRP including respiratory physiotherapy, inhalation, physical activity training in group sessions. Two-hundred-and-eight healthy children (aged 11.9±2.0 years) were examined and assigned to the control group (C). Both groups underwent a CE assessment, which was performed with a tape cloth measure at the level of 4th intercostal space (IC) and at the level of xiphoid process (XP).**Results:** CE of the I group was significantly lower at baseline compared to the C group. After the 4-week PRP a significant improvement was achieved that resulted in a presence of not significant difference between the I and C group in almost all subgroups.

CE of BA and healthy children

	CE (cm)	I baseline	C	p (t-test)	I follow-up	C	p (t-test)
Girls	IC	5.4±1.5	6.9±1.7	0.000	6.9±2.0	6.9±1.7	NS
Girls	XP	4.6±2.0	6.4±1.6	0.000	5.8±1.8	6.4±1.6	0.03
Boys	IC	6.0±2.4	7.4±1.7	0.000	7.8±2.3	7.4±1.7	NS
Boys	XP	5.7±2.3	6.5±1.8	0.02	7.1±2.2	6.5±1.8	NS

Conclusion: The PRP led to a significant improvement of chest expansion in BA children, who had CE previously decreased.

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Reference:

- [1] Lopes, E. A. et al. Assessment of muscle shortening and static posture in children with persistent asthma. *Eur J Pediatr* 2007; 166: 715-721.

P1198**Chest expansion in preschool-age children with mild bronchial asthma**Katerina Neumannova¹, Jakub Zatloukal¹, Jana Rydlova², Martina Slachetova¹.¹Department of Physiotherapy, Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic; ²Miramonti Children's Medical Institution, Luhacovice Spa, a.s., Luhacovice, Czech Republic**Introduction:** A chronic respiratory disease in adults is often connected with limited chest expansion (CE). We can not find the evidence about CE in preschool-age children at previous published studies and there are no reference values to express if there is a serious limitation.**Aims:** To evaluate an effect of a 4-week pulmonary rehabilitation programme (PRP) on CE in preschool-age children with mild bronchial asthma (BA).**Methods:** One-hundred-and-three children (aged 5.2±0.7 years) with BA were examined and recruited for the intervention group (I), which attended a 4-week PRP including respiratory physiotherapy, inhalation, physical activity training in group sessions. One-hundred-and-sixty-four healthy children (aged 5.2±0.8 years) were examined and assigned to the control group (C). Both groups underwent a CE assessment, which was performed with a tape cloth measure at the level of 4th intercostal space (IC) and at the level of xiphoid process (XP).**Results:** Both levels of CE of the I group were significantly lower at baseline compared to the C group. After completing the 4-week PRP a significant improvement was achieved that resulted in a presence of not significant difference between the I and C group in almost all subgroups.

CE of BA and healthy children

	CE (cm)	I baseline	C	p (t-test)	I follow-up	C	p (t-test)
Girls	IC	2.3±0.9	2.9±1.2	0.004	2.9±1.0	2.9±1.2	NS
Girls	XP	2.5±1.5	3.0±1.2	0.02	3.1±1.3	3.0±1.2	NS
Boys	IC	2.5±0.8	3.2±1.3	0.001	2.8±0.9	3.2±1.3	NS
Boys	XP	2.6±0.9	3.6±1.7	0.000	3.0±1.0	3.6±1.7	0.02

Conclusion: The decreased CE constituted a functional disorder in BA children, because the PRP led to a significant improvement and restoration of their CE.

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P1199**Maximal inspiratory and expiratory mouth pressures in children with mild bronchial asthma**Jakub Zatloukal¹, Katerina Neumannova¹, Jana Rydlova², Dana Dvorakova¹.¹Department of Physiotherapy, Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic; ²Miramonti Children's Medical Institution, Luhacovice Spa, Luhacovice, Czech Republic**Introduction:** Decreased respiratory muscle strength can lead to a higher respiratory effort that reflects on a quality of life in patients with bronchial asthma (BA).**Aim:** To compare maximal inspiratory (MIP) and expiratory (MEP) mouth pressures in healthy children and children with BA undergoing a pulmonary rehabilitation programme (PRP).**Methods:** The examined group (E) consisted of 108 children with mild BA (aged 11.9±2.6 years), who underwent a 4-week PRP which included respiratory physiotherapy and physical activity training. The MIP and MEP assessment was performed at the baseline and after the PRP. The control group (C) consisted of 208 healthy children (aged 11.9±2.0 years) without any treatment.**Results:** The MIP and MEP values of BA children were about the same or lower than those of C group at the beginning of the PRP, but there were no significant differences among the groups (Table 1). A significant improvement of MIP and MEP was observed in BA children after the PRP (Table 2) and furthermore the MIP and MEP values were higher than values in C group (Table 1).

Table 1

Mouth pressure (cmH2O)		E baseline	C	p (t-test)	E follow-up	C	p (t-test)
Girls	MIP	58.3±23.9	58.2±21.7	NS	71.2±24.9	58.2±21.7	0.0005
	MEP	64.3±23.3	71.4±24.4	NS	78.7±25.6	71.4±24.4	NS
Boys	MIP	76.5±29.5	74.6±24.3	NS	89.1±28.6	74.6±24.3	0.0005
	MEP	90.0±33.6	89.4±23.9	NS	104.3±33.7	89.4±23.9	0.002

Table 2

	Mouth pressure (cmH2O)	E baseline	E follow-up	p (t-test)
Girls	MIP	58.3±23.9	6.9±1.7	0.000
	MEP	64.3±23.3	6.4±1.6	0.000
Boys	MIP	76.5±29.5	7.4±1.7	0.000
	MEP	90.0±33.6	6.5±1.8	0.000

Conclusion: The MIP and MEP values in children with mild BA are not significantly lower than values of healthy children.

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P1200**In vitro comparison of emitted dose with 2 types of nebulizers during non invasive ventilation**Jean-Bernard Michotte, Emilie Jossen, Jean Roeseler, Giuseppe Liistro, Grégory Reyckler. *Physiotherapy, Haute Ecole de Santé Vaud, Lausanne, Switzerland Intensive Care Unit, Cliniques Universitaires Saint-Luc, Brussels, Belgium Pneumology Unit, Cliniques Universitaires Saint-Luc, Brussels, Belgium***Introduction:** Non invasive ventilation (NIV) and inhaled therapy are important components of the medical management of COPD patients. Sometimes, both therapies need to be administered simultaneously. It has been shown that it is feasible and effective to deliver nebulized bronchodilators during NIV.**Objectives:** Primary objective was to compare emitted dose (ED) of different types of nebulizers coupled with a single limb circuit bilevel ventilator. Secondary objective was to evaluate the impact of the position of nebulizers on the circuit.**Material and methods:** Amikacin (500mg in 4 mL) was nebulized by two vibrating mesh nebulizers (Aeroneb®Pro and Aeroneb® Solo, Aerogen, Ireland) and by a classical jet nebulizer (SideStream; Medic-Aid; UK). The nebulizers were connected to a single limb circuit ventilator (Trilogy® 100, Philips-Respironics, USA), either before (Position 1) or after (Position 2) the passive exhalation port (Whisper Swivel II® Philips-Respironics, USA). The bilevel ventilator was set in spontaneous mode and connected to a lung model to mimic a COPD patient breathing (RR of 16 breaths/minute, I/E ratio of 1:3 and VT of 400 mL). A filter was interposed between the lung model and the circuit. ED was measured by the residual gravimetric method.**Results:**

Emitted dose by nebulizer at each position

	Aeroneb®Pro	Aeroneb®Solo	Jet nebulizer	p
Position 1	98.7±4µg	113.1±10µg	76.8±8µg	0.004
Position 2	309±18µg	343.3±30µg	96.8±5µg	<0.0001
p	<0.0001	0.0001	<0.05	

Mean±SD.

Conclusion: Associated with a single limb circuit bilevel ventilator, emitted dose of vibrating mesh nebulizers are greater than jet nebulizer. Moreover to place the nebulizer after the passive exhalation port is optimal for all the devices.