

EPRS—Abstracts for Oral Presentations

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Bronchial Responsiveness (BR) measured by forced pseudo-random noise oscillometry (MFOT) in children who had bronchiolitis, children with asthma and healthy subjects.

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Various environmental factors may influence BR in a negative way, and may worsen the degree of BR with age. The incidence of increased BR in young children is not well known. To measure BR at young age lung function measurements are necessary. MFOT is an ideal method for about 2½ years of age because only passive cooperation is needed. We investigated children who had infant bronchiolitis (i.e. tachypneu, breathlessness, hyperinflation, wide spread crepitations, hypercapnia (pCO₂ > 47 mm Hg) and hypoxemia (pO₂ < 80 mm Hg) and compared these with asthmatic and healthy subjects of the same age. We studied which of the children who had infant bronchiolitis have recurrent episodes of wheeze and cough during later life and whether this goes with abnormal base-line lungfunction, bronchoconstriction and increased BR. 10/16 children, aged 2.6 - 12.8 yrs, who had bronchiolitis showed present recurrent respiratory symptoms. Baseline lung function values were abnormal in 6. Increased bronchial smooth muscle tone (i.e. > 1 SD score change) was present in 7. BR measured by MFOT was expressed as SD score differences from BR in healthy children. BR was more than 1 SD score higher in half of the children with present recurrent respiratory symptoms, in 1/4 with past symptoms and in 0/2 who never had recurrent symptoms after bronchiolitis. Children who had bronchiolitis showed increased bronchial smooth muscle tone as in asthma; BR in those with present recurrent respiratory symptoms corresponds with BR in mild asthmatics. These children might be regarded as mild asthmatics and treated as such.

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DOSE RESPONSE CURVES TO COLD AIR CHALLENGE (CACH) IN CHILDREN WITH ASTHMATIC AIRWAY HYPERREACTIVITY.

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A previous study of CACH in asthmatic children produced indirect evidence of a reaction plateau (Zach et al., *Pediatr Res* 18:469, 1984). In order to directly examine this phenomenon, nine boys and 8 girls (mean age 13 6/12 years) were challenged by isocapnic hyperventilation of -10°C air at 75% of MVV for 10 minutes. Each minute FEV₁ and V_{max}^{25%VC} were measured. During recovery these measurements were repeated every minute for 10 minutes. Analysis of the cumulative dose-response curves constructed from these measurements revealed that a maximum reaction plateau was reached by both PFT-parameters in each child. The reaction plateau for V_{max}^{25%VC} was reached somewhat earlier than for FEV₁. This, the more abnormal baseline and lower absolute value at maximum reaction for V_{max}^{25%VC}, with comparable maximum changes for both tests, indicate a dose response markedly influenced by the baseline small-airway obstruction. By identifying a reaction plateau, CACH offers a new parameter for outlining the individual dimensions of airway hyperreactivity in children with asthma.

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RELATIONSHIP BETWEEN BRONCHIAL HYPERREACTIVITY, EIA AND SKIN PRICK TEST AFTER INFANTILE OBSTRUCTIVE BRONCHITIS

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The clinical symptoms of the wheezy or obstructive bronchitis and asthma are quite similar. Averagely 10 years after obstructive bronchitis suffered before 2 years of age, the bronchial hyperreactivity /BH/ of children was examined by acetylcholine and histamine challenge, then 2.5 years later free running /EIA/ /6mins/ and skin prick test /SPT/ were performed with 20 common allergens. Personal and familial anamnestic data have also been registered. 111 children: 33 girls and 78 boys participated in the follow-up. By the time of the 2. follow-up, 7-14 years after the last episode of obstructive bronchitis 2 of them became asthmatic and 4 got hay fever.

	BH	EIA	SPT	Family allergy
BH 47 pat.	-	2*	4**	19**
EIA 6 "	2*	-	1*	3*
SPT 13 "	4**	1*	-	-
Family 57 "	19**	3*	11	11

allergy ** means 1 or 2 new atopic(s)
In contrast to asthmatics no correlation was found between EIA and BH, as well as between BH and SPT positivity, however, significant correlation occurred between SPT positivity and familial allergic disease.

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INVOLVEMENT OF THE SYMPATHETIC NERVOUS SYSTEM (SNS) IN EXERCISE INDUCED ASTHMA (EIA).
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When strenuous exercise is performed under ambient laboratory conditions the incidence of EIA is reported to be 80% of the clinically recognized asthmatic population. A heat and water loss, bronchial reflex mechanisms and an imbalance within the autonomic nervous system were suggested to account for EIA. In order to investigate whether the SNS might be involved we have determined plasma noradrenaline (NA) as well as the density and affinity of α- and β-adrenoceptors on thrombocytes (THRO) and lymphocytes (LY) in children suffering from EIA and in control children before and after a 7min run. The determination of NA was performed radioenzymatically, that of the adrenoceptors on THRO and LY by use of the radioligands [³H]-Yohimbine or [¹²⁵I]-Cyanopindolol. Under resting conditions both asthmatic and non-asthmatic children showed identical plasma levels of NA and an identical density of adrenoceptors on THRO and LY. In response to exercise children with EIA released significantly more NA than the controls. Concomitantly, in children with EIA α- and β-adrenoceptor density remained unchanged by exercise whereas the controls showed a 40% increase in β-, but no increase in α-adrenoceptors. The results may be compatible with the suggestion that either an exaggerated NA release may down regulate β-adrenoceptors in EIA or a functional blockade of β-adrenoceptors may produce a NA release to overcome the blockade.

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PHYSICAL ACTIVITIES AND AIRWAY OBSTRUCTION IN ASTHMATIC CHILDREN
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Various physical activities have been responsible for airway obstruction in asthmatic children. We report the results of 5min free running outdoors, 5min bicycle ergometer physical load/2W/kg b.w./ on lung function tests reflecting airway obstruction in asymptomatic asthmatic children, 6 to 15 years old. The effects of forced expiration maneuver, inhalations of acetylcholine and histamine on induced airway obstruction were also studied in the same subjects. Maximum expiratory flow at 25% of VC was the most sensitive parameter in detecting the induced airway obstruction. Based on the latter parameter, airway obstruction following 5min free running outdoors was revealed in 80 - 100% of the patients. Mean percent reduction of the latter parameter varied from 60 to 80% of the initial value. The 5min bicycle ergometer exercise of about the same extent evoked much lower reduction/10%/ of the latter parameter. The induced airway obstruction by 5min free running outdoors was prevented by a cloth face mask at running, inhalations of beta-2-mimetics, anticholinergic agent. The 5min free running outdoors induced about the same extent of airway limitation as a 3mg acetylcholine inhalation. We concluded that a 5min free running outdoors was as a most suitable test for an induced airway obstruction in our asthmatic children.

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COURSE OF "CONTINUOUS ASTHMA" IN CHILDREN WITHIN DIFFERENT FUNCTIONAL GROUPS. R. Kraemer, S. Zeltner, F. Sennhauser, E. Rossi; Dept. of Paediatrics, University of

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During a 5 year period (1980-1984) 117 asthmatic children with continuous asthma (aged 5-18 y) have been followed in intervals of 8-12 months at least 3 times. The patients were assigned to four functional groups according to the lung function data where CN contains 17 patients (15 %) with lung function data within the 2SD-range of values predicted, C₁ 20 patients (17 %) with hyperinflation (FRC > 130 % pred.), C₂ 29 patients (25 %) with hyperinflation and bronchoconstriction (Raw > 130 % pred.), and C₃ 46 patients (39 %) only with bronchoconstriction. According to the degree of functional abnormalities 4 severity degrees were defined. After regular treatment with β₂-mimetics, mast-cell-stabilisation and/or topical steroids, 37 % of patients with the bronchial type of disease (C₃) became normal, whereas hyperinflation persisted in 80 % of patients from the group with hyperinflation (C₁). In group C₂ 34 % became normal; of the remaining patients 6 persisted to be hyperinflated, whereas 10 had still bronchoconstriction. Concerning severity of disease, best tendency for remission was observed in the age group 11-13 y, less also in 5-7 y and 8-10 y. Patients older than 14 y showed a slight worsening of the disease. It is concluded: 1) Childhood asthma diagnosed under the age of 10 y has a good tendency for remission. 2) Hyperinflation in asthmatic children seems to be a functional abnormality resistant to conventional treatment and therefore needs special attention in the follow-up. In further studies, an appropriate treatment of hyperinflation has to be evaluated.