

Associated factors for recurrent wheezing in infancy

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Key words: infants; risk factors; wheezing.

A cross-sectional study by applying a standardized and validated questionnaire (1) (EISL, from Spanish: *Estudio Internacional de Sibilancias en Lactantes*) to parents of infants, aged 12–15 months, that attended 35 random Health Centers in Curitiba, south of Brazil, for routine immunization between August 2005–December 2006. Factors associated with recurrent wheezing (≥ 3 episodes) were studied using bivariate and multivariate analysis. Introduction of factors in the multivariate analysis used P -values less than 0.2 obtained in bivariate analysis, according to the methodology of binary logistic regression analysis. P -values less than 0.05 were considered statistically significant. The Institutional Review Board at Hospital de Clínicas of Federal University of Paraná, approved this protocol and a signed informed consent was obtained from guardians.

A total of 3003 parents answered the written questionnaire and 22.6% of their infants had recurrent wheezing (2). Independent risk factors were parental asthma history (both mother and father), bronchopneumonia, day care attendance, dog at home and smoking in pregnancy. Colds starting after four months of age and mother literacy were protection factors (Fig. 1).

Recurrent wheezing in early life can predict asthma in older children. It is important to identify infants with recurrent wheezing and risk to develop asthma in the future. Although this study was limited by a target sample, the number of questionnaires answered was adequate to estimate sample size and the standardized instrument had high concordance, sensitivity, specificity, positive and negative predictive values (1).

Familial history of asthma, parents in particular, is well known as risk factors for asthma. In our infants a strong relation for recurrent wheezing was observed when both parents were asthmatics. Isolated mother's and father's history of asthma is recognized as major criteria to predict asthma in children but there are no data regarding the role of both parent's asthma to predict wheezing or asthma in pediatric studies.

History of bronchopneumonia was risk factors for recurrent wheezing in our infants. A longitudinal study identified pneumonia as risk for recurrent wheezing in Chilean low income children in the first

year of life (3). Despite the current global economical situation Curitiba ranks seventh in income *per capita* among Brazilian cities and is considered to have a high human development index. Dom et al., in a birth cohort study from Belgium children, found that mother with high educational level was a protection factor for recurrent wheezing (4). Our finding corroborates this idea and socioeconomic status could be protective against recurrent wheezing in the first 12 months of life depending upon the region is surveyed.

Day care attendance and high number of colds, starting early in life, may result in wheezing infants. Smoking during pregnancy also is a risk factor for wheezing due to a reduction of airway caliber (5). In our population day care attendance and smoking in pregnancy were risk factors. The number of colds in the first year of life was not related to recurrent wheezing in Curitiba, but if colds started later on, it was a protection factor.

Pets in home protect from wheezing in the first year of life, if parents were not asthmatics (6). In our population parent's

There are no data regarding risk and protection factors for recurrent wheezing in infancy around the world using a standardized protocol.

Smoking in pregnancy
(OR = 1.86; CI 95% = 1.28–2.70; $P = 0.001$)

Daycare attendance
(OR = 1.76; CI 95% = 1.33–2.35; $P = 0.0001$)

Colds >4 months age
(OR = 0.57; CI 95% = 0.42–0.76; $P = 0.0001$)

Mother >12 years school
(OR = 0.73; CI 95% = 0.55–0.97; $P = 0.03$)

Dog at home
(OR = 1.51; CI 95% = 1.16–1.96; $P = 0.002$)

Bronchopneumonia
(OR = 1.76; CI 95% = 1.28–2.42; $P = 0.0006$)

Asthma in parents
(OR = 4.19; CI 95% = 1.03–16.97; $P = 0.04$)

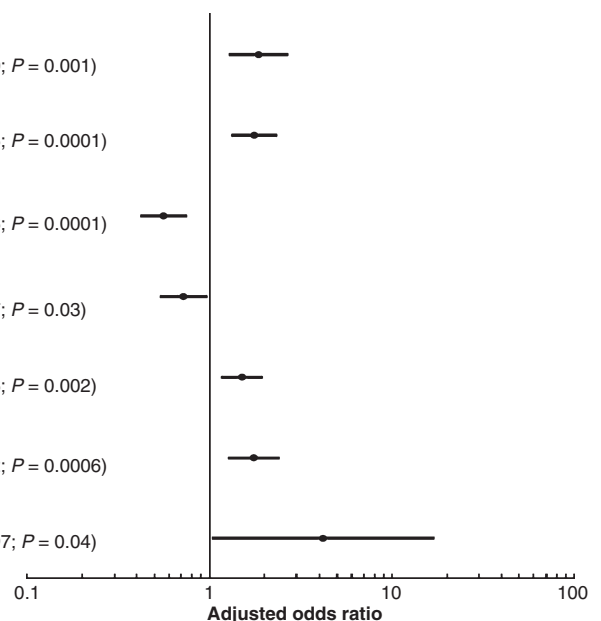


Figure 1. Protection and risk factors for recurrent wheezing in infancy.

history of asthma and the presence of dog were independent risk factor for recurrent wheezing.

Despite the study design, it permitted the identification of factors associated of recurrent wheezing in infancy and provided a background for starting early prevention and treatment of asthma. Regardless different asthma phenotypes, associated factors of recurrent wheezing vary around the world and further multicenter studies are needed.

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