

Asthma News This Week

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JOURNAL articles

Ochoa, Sangrador C. and Alba Vasquez Blanco. Day-care center attendance and risk of Asthma- A systematic review. *Allergologia et immunopathologia (Madrid)*. Nov-Dec 2018; 46(6): 58-584. doi: [10.1016/j.aller.2018.03.006](https://doi.org/10.1016/j.aller.2018.03.006).

INTRODUCTION AND OBJECTIVES: Asthma and other wheezing disorders are common chronic health problems in childhood. We aim to evaluate whether the attendance by children under three years of age to day-care centers is a protector or risk factor in the development of recurrent wheezing or asthma in the following years of their lives. **METHODS:** Systematic review of published cohort or cross-sectional studies, without any time limitation. We searched in PubMed, Cinhal, Cuiden and Scopus (EMBASE included). The quality of the studies was evaluated using the Newcastle-Ottawa Scale. Disagreements were solved by mutual consensus. Weighted odds ratio (ORs) were estimated using RevMan 5.3, following random effects models. **RESULTS:** We selected 18 studies for qualitative analysis, nine cohort studies and nine cross-sectional studies. Day-care center attendance is associated with an increased risk of early recurrent wheezing (four studies; 50,619 subjects; adjusted OR 1.87 [1.21 to 2.88]; I² 91%) and asthma before the age of six (five studies; 5412 subjects; adjusted OR 1.59 [1.26 to 2.01]; I² 0%), but not later (five studies; 5538 subjects; adjusted OR 0.86 [0.55 to 1.32]; I² 76%). **CONCLUSIONS:** Children attending day-care center during the first years of life have a higher risk of recurrent wheezing during the first three years and asthma before the age of six, but not

later. This risk must be taken into account to inform parents in order to choose what kind of care children should have throughout infancy and to implement preventive measures to reduce its impact.

Perry, Richard, et al. The Economic Burden of Pediatric Asthma in the United States: Literature Review of Current Evidence. *Pharmacoeconomics*. Oct 2018. doi: 10.1007/s40273-018-0726-2. [e-pub ahead of print]

Asthma is a chronic respiratory disease that is widespread throughout the US population and disproportionately affects children. This literature review aimed to identify recent information regarding the economic burden of pediatric asthma in the US. MEDLINE, EMBASE, Econlit, and PsycINFO databases and gray literature sources were searched from January 2012 to January 2018 to capture relevant publications. Publications reporting on healthcare resource utilization and/or healthcare costs of pediatric asthma were included (n = 8). Total direct costs of pediatric asthma were US\$5.92 billion in 2013. Average annual costs per child ranged from US\$3076 to US\$13612. Across studies, pharmacy (US\$1027-2120), inpatient (US\$337-2016) and outpatient (US\$1049-8039) costs were the primary contributors to healthcare costs. Inpatient and emergency department (ED) visits exerted a high economic burden. For instance, the national annual cost of asthma-related hospitalizations was estimated at US\$1.59 billion in 2009, while estimates of costs-per-hospitalization (2010) and charges-per-discharge (2009) were US\$3600 and US\$8406, respectively. The total cost of ED visits to Medicaid was estimated at US\$272 million in 2010. In a mixed-insurance population, ED cost estimates ranged from US\$152 to US\$172 annually per patient. Invariably, costs for children with asthma were significantly greater than for children without. Pediatric asthma imposes a significant economic burden to the US healthcare system. Children with asthma have significantly higher healthcare resource utilization and costs than children without asthma.

Association between second hand smoke (SHS) exposure and caregiver stress in children with poorly controlled asthma. *Journal of Asthma*. Oct 2018: 1-12. doi: [10.1080/02770903.2018.1509989](https://doi.org/10.1080/02770903.2018.1509989).

OBJECTIVE: Urban children with asthma experience high rates of second hand smoke (SHS) exposure. The objective was to examine whether SHS exposure is associated with symptom frequency in children with poorly controlled asthma. **METHODS:** Children were enrolled in a RCT to test the efficacy of an environmental control behavioral intervention versus an attention control group and followed over 12 months. SHS exposure assessed using salivary cotinine measurement. Frequency of child asthma symptoms, healthcare utilization, household smoking and caregiver daily life stress were obtained via caregiver report. Time of enrollment was recorded to assess seasonal factors. Symptom days and nights were the primary outcomes. Multivariable models and odds ratios examined factors that best predicted increased frequency of daytime/nighttime symptoms. **RESULTS:** Children (n = 222) with a mean age of 6.3 (SD 2.7) years, were primarily male (65%), African American (94%), Medicaid insured (94%), and had

poorly controlled asthma (54%). The final multivariable model indicated symptoms in the fall (OR 2.78; 95% CI 1.16, 6.52) and increased caregiver daily life stress (OR 1.13, 95% CI 1.02, 1.25) were significantly associated with increased symptom days when controlling for cotinine level, intervention status, child age and home and car smoking restrictions. **CONCLUSIONS:** There was no impact of SHS exposure on increased symptom frequency. High caregiver daily life stress and symptoms in fall season may place children with asthma at risk for increased day/nighttime symptoms. Close monitoring of symptoms and medication use during the fall season and intervening on caregiver life stress may decrease asthma morbidity in children with poorly controlled asthma.

Sandall, Jane, et al. Short-term and long-term effects of caesarean section on the health of women and children. *Lancet*. Oct 2018; 392(10155): 1349-1357. doi: [10.1016/S0140-6736\(18\)31930-5](https://doi.org/10.1016/S0140-6736(18)31930-5).

A caesarean section (CS) can be a life-saving intervention when medically indicated, but this procedure can also lead to short-term and long-term health effects for women and children. Given the increasing use of CS, particularly without medical indication, an increased understanding of its health effects on women and children has become crucial, which we discuss in this Series paper. The prevalence of maternal mortality and maternal morbidity is higher after CS than after vaginal birth. CS is associated with an increased risk of uterine rupture, abnormal placentation, ectopic pregnancy, stillbirth, and preterm birth, and these risks increase in a dose-response manner. There is emerging evidence that babies born by CS have different hormonal, physical, bacterial, and medical exposures, and that these exposures can subtly alter neonatal physiology. Short-term risks of CS include altered immune development, an increased likelihood of allergy, atopy, and asthma, and reduced intestinal gut microbiome diversity. The persistence of these risks into later life is less well investigated, although an association between CS use and greater incidence of late childhood obesity and asthma are frequently reported. There are few studies that focus on the effects of CS on cognitive and educational outcomes. Understanding potential mechanisms that link CS with childhood outcomes, such as the role of the developing neonatal microbiome, has potential to inform novel strategies and research for optimising CS use and promote optimal physiological processes and development.

Joschtel, Barbara, et al. Effects of exercise training on physical and psychosocial health in children with chronic respiratory disease: a systematic review and meta-analysis. *BMJ Open Sport and Exercise Medicine*. Oct 2018; 4(1): e000409. doi: 10.1136/bmjsem-2018-000409.

INTRODUCTION: Chronic disease in children is increasing, including the prevalence of chronic respiratory diseases such as asthma, cystic fibrosis (CF), bronchiectasis and bronchopulmonary dysplasia (BPD). The aim of this systematic review and meta-analysis was to evaluate the effects of exercise training on health outcomes in children with chronic respiratory disease. **METHOD:** Five databases were searched for randomised controlled trials investigating the effects of exercise training on children with chronic respiratory disease. Following the PRISMA

guidelines, eligible studies were identified and data were extracted. A meta-analysis was conducted for the outcomes cardiovascular fitness, lung function and quality of life (QoL). RESULTS: The initial search returned 3688 papers. Twenty-seven (17 in children with asthma, 10 in children with CF) were included in the systematic review and 24 of these were included in the meta-analysis. No studies were identified in children with bronchiectasis or BPD. Included papers had a total of 1009 participants aged 8-20 years. In addition to cardiovascular fitness, lung function and QoL, studies also assessed pulmonary function, respiratory muscle strength, muscular strength and inflammation. Meta-analysis showed a large significant effect size in favour of exercise for cardiovascular fitness (peak VO₂) (standard mean difference (SMD)=1.16, 95% CI 0.61 to 1.70) and QoL (SMD=1.27, 95% CI 0.72 to 1.82) as well as a small, non-significant effect size for lung function (FEV₁) (SMD=0.02, 95% CI -0.38 to 0.42). CONCLUSION: Exercise training significantly improves cardiovascular fitness and QoL in children with asthma and CF. Further research is needed, particularly in children with bronchiectasis and BPD.

Tang, Howard, et al. Trajectories of childhood immune development and respiratory health relevant to asthma and allergy. *eLife*. Oct 2018; 7: pii: e35856. doi: [10.7554/eLife.35856](https://doi.org/10.7554/eLife.35856).

Events in early life contribute to subsequent risk of asthma; however, the causes and trajectories of childhood wheeze are heterogeneous and do not always result in asthma. Similarly, not all atopic individuals develop wheeze, and vice versa. The reasons for these differences are unclear. Using unsupervised model-based cluster analysis, we identified latent clusters within a prospective birth cohort with deep immunological and respiratory phenotyping. We characterised each cluster in terms of immunological profile and disease risk, and replicated our results in external cohorts from the UK and USA. We discovered three distinct trajectories, one of which is a high-risk 'atopic' cluster with increased propensity for allergic diseases throughout childhood. Atopy contributes varyingly to later wheeze depending on cluster membership. Our findings demonstrate the utility of unsupervised analysis in elucidating heterogeneity in asthma pathogenesis and provide a foundation for improving management and prevention of childhood asthma.

In the NEWS

[Early-Onset Asthma/Wheezing Associated With Later Childhood Obesity](#). *Pulmonology Advisor*. Oct 18, 2018.

Matti, Mariam. [\\$8 Million Grant Aims to Improve Asthma Control Among Children in Navajo Nation](#). *Allergic Living*. Oct 18, 2018.

Ryan, Julie. [Explaining the Higher Rates of Asthma Among Dallas' Black Children](#). *Dallas Observer*. Oct 11, 2018.