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A COMPREHENSIVE STUDY ON RISK OF OBSTRUCTIVE LUNG DISEASE IN CHILDHOOD PNEUMONIA AMONG LOCAL POPULATION OF PAKISTAN

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Abstract:
Introduction: *Chronic obstructive pulmonary disease (COPD) is a heterogeneous disease, including emphysema and large and small airway disease.*
Objectives of the study: *The main objective of the study is to analyze the risk of obstructive lung disease in childhood pneumonia among local population of Pakistan.*
Methodology of the study: *This study was conducted at Children Hospital Lahore during 2018. This study was done with the permission of ethical committee. For this purpose, we select 50 patients of pneumonia (age 1 to 15 years) for further analysis. The patients of both genders were selected for this study. Childhood pneumonia was defined by subject self-report.*
Result: *Significant differences were observed between patients who received extra-fine versus fine-particle COPD in the demographics and baseline characteristics, as shown in Table 1. The COPD treatments prescribed to patients before and at step-up are shown in S1 Table in the supporting information.*
Conclusion: *In conclusion, the COPD exacerbation rate was higher among the patients who had a history of pneumonia or a high rate of COPD exacerbation in the preceding period of 1 year.*
Key words: *Pneumonia, fever, COPD, Lungs*

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INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) is a heterogeneous disease, including emphysema and large and small airway disease. The most recent update from the Global Initiative for Obstructive Lung Disease (GOLD) has addressed COPD subgroups, and there is a recognized need to better define COPD subtypes [1]. Several COPD subtypes have been shown to respond to specific treatments, including long-term oxygen for hypoxemic patients, lung volume reduction surgery for upper lobe predominant emphysema, and medications including inhaled corticosteroids, azithromycin and roflumilast for frequent acute exacerbations [2]. Pneumonia is a common pediatric diagnosis that poses a significant risk for future respiratory disease. Multiple investigations have found an association between pneumonia in childhood and decreased adult lung function, raising the question of whether childhood pneumonia is a risk factor for chronic obstructive pulmonary disease (COPD). Prior studies are limited by small sample sizes, short-term follow-up, absence of post-bronchodilator lung function, differing definitions of respiratory illness, sampling bias, and recall bias [3]. In patients with COPD, low-dose ICS/LABA combination has been shown to reduce exacerbations, improve quality of life and lung function, through an underlying complementary anti-inflammatory cellular action. However there continues to be significant concern regarding inappropriate prescribing of high-dose ICS in patients with obstructive lung diseases, with untoward consequences for patients [4].

The first laboratory based observational study was conducted in Rawalpindi between 2002 and 2003. The study demonstrates a low diagnostic yield for isolated pathogens 88 out of 510 specimens (17.25%). Most commonly identified pathogen was Haemophilus influenzae (HI) with a strikingly high relative frequency (64 out of 88) among isolates [5]. However, this yield is reported in a majority of paediatric population (41 out of 64) with 33 being less than five years of age. These figures therefore will not be in any way reflective of adult CAP status [6]. According to the World Health Organisation (WHO) estimates, pneumonia accounts for 16 percent of the total child deaths making it the leading killer of children less than 5 years of age globally. Pneumonia is a form acute respiratory infection that affects lungs [7].

OBJECTIVES OF THE STUDY:

The main objective of the study is to analyze the risk of obstructive lung disease in childhood pneumonia among local population of Pakistan.

METHODOLOGY OF THE STUDY:

This study was conducted at Children Hospital Lahore during 2018. This study was done with the permission of ethical committee. For this purpose, we select 50 patients of pneumonia (age 1 to 15 years) for further analysis. The patients of both genders were selected for this study. Childhood pneumonia was defined by subject self-report. The questionnaire asked: “Have you ever had pneumonia or bronchopneumonia?” and their age at the first episode. Subjects were classified as childhood pneumonia if they reported an age of first pneumonia at < 16 years or “As a child; age not known.” Patients with any other chronic respiratory disease, at any time were excluded from the study.

STATISTICAL ANALYSES:

Baseline characteristics of unmatched and matched patients prescribed either fine- or extra-fine particle ICS are described using summary statistics and compared using χ^2 or Mann-Whitney *U* tests as appropriate.

RESULT:

Significant differences were observed between patients who received extra-fine versus fine-particle COPD in the demographics and baseline characteristics, as shown in Table 1. The COPD treatments prescribed to patients before and at step-up are shown in S1 Table in the supporting information.

Table 01: Baseline and clinical characteristics of pneumonia patients with obstructive lung diseases

	Childhood Pneumonia		No Childhood Pneumonia		*p*Value[b]
DEMOGRAPHIC					
Male gender (%)	437	(51.2 %)	4990	(53.6 %)	0.18
Mean age, years (SD)	61.7	(8.9)	59.4	(9.0)	<0.001[c]
Non-Hispanic white (%)	693	(81.1 %)	6073	(65.3 %)	<0.001
SMOKE EXPOSURE					
In-utero smoke exposure (%)[a]	206	(33.0 %)	2082	(30.2 %)	0.18
Lived with smoker in childhood (%)[a]	732	(85.7 %)	7618	(81.9 %)	0.006
Mean age started smoking, years (SD)	16.5	(4.4)	16.9	(4.7)	0.06
Pack-years of smoking (SD)	49.8	(28.4)	43.7	(24.6)	<0.001
Current smoking (%)	379	(44.4 %)	5011	(53.9 %)	<0.001
PNEUMONIA HISTORY					
Ever had pneumonia (%)	854	(100.0 %)	2979	(33.9 %)	<0.001
Diagnosed with pneumonia by healthcare provider (%)[a]	821	(96.1 %)	2920	(31.4 %)	<0.001
Pneumonia childhood age unknown (%)	378	(44.3 %)	0	(0.0 %)	<0.001
Age first pneumonia in years, mean (SD)[a]	7.7	(4.5)	42.5	(15.6)	<0.001
Lifetime pneumonia episodes (SD)[a]	3.9	(4.9)			

Patients stepping-up their ICS therapy to extra-fine particle ICS were significantly less likely to be coded for pneumonia compared to those stepping-up to fine-particle ICS, having adjusted for confounders (table 2).

Table 2: Pneumonia diagnosis by treatment group.

	Childhood Pneumonia		No Childhood Pneumonia		Impact of Childhood Pneumonia[a]		
					OR	(95 % CI)	*p*Value[b]
COPD, GOLD 2-4	405	(59.0 %)	3267	(44.4 %)	1.40	(1.17, 1.66)	<0.001
COPD, GOLD 2-4 + adjusted for childhood asthma					1.30	(1.09, 1.55)	0.003

DISCUSSION:

The role of childhood pneumonia in COPD development has been investigated for over sixty years. Oswald surveyed 1000 adults with chronic bronchitis in London from 1951-53, finding 14.3 % reported childhood pneumonia compared to 6 % of controls [9]. The pathophysiological mechanisms that contribute to an increased susceptibility to pneumonia in patients treated with ICS are unclear [8]. In murine models, ICS have been shown to significantly increase alveolar macrophage efferocytosis (uptake of apoptotic cells by alveolar macrophages), thereby reducing their ability to combat microbes, including *Streptococcus pneumoniae*, the most common cause of community acquired pneumonia in patients with COPD [10]. A recent study in a cohort of children with persistent asthma taking daily ICS showed nearly four times greater oropharyngeal colonization with *Streptococcus pneumoniae* compared to children not receiving ICS, which may increase the risk of having pneumococcal respiratory infections. Several studies have demonstrated an intra-class difference between both mono-component ICS and fixed combinations of ICS/LABA with regard to the risk of pneumonia and pneumonia related events in COPD patients [11].

CONCLUSION:

In conclusion, the COPD exacerbation rate was higher among the patients who had a history of pneumonia or a high rate of COPD exacerbation in the preceding period of 1 year.

REFERENCES:

1. Butt T, Rafi N, Ahmed S, Ahmed RN, Salman M, Mirza SH. Community-acquired bacterial pneumonias in Rawalpindi. Pak J Pathol 2005; 16:14-6.
2. Zafar A, Husaain Z, Lomama E, Sibillie S, Irfan S, Khan E. Antibiotic susceptibility of pathogens isolated from patients with community acquired respiratory tract infections in Pakistan - The Active Study. J Ayub Med Coll Abbottabad 2008; 20: 7-9.

3. Irfan M, Hussain SF, Mapara K, Memon S, Mogri M, Bana M. Community acquired pneumonia: risk factors associated with mortality in a tertiary care hospitalized patients. J Pak Med Assoc 2009; 59: 448-52.
4. Choudhry S, Khan EA, Raja NU. Streptococcus Pneumoniae: Frequency, Susceptibility, Clinical Features and Outcome at a Tertiary Care Hospital. Infectious Diseases Journal of Pakistan 2011; 20: 264-8.
5. Malik AS, Khan MI. Profiles of community acquired pneumonia cases admitted to a Tertiary Care Hospital. Pak J Med Sci 2012; 28: 75-8.
6. Zubairi ABS, Zafar A, Salahuddin N, Haque AS, Waheed S, Khan JA. Atypical pathogens causing community acquired pneumonia in adults. J Pak Med Assoc 2012; 62: 653-6.
7. Raza MZ, Ahmed A, Ahmed F, Ghani A, Rizvi N. Seasonal incidence of community acquired pneumonia and its mortality in Karachi- A multi-centric hospital based study International Journal of Environmental Sciences 2012; 3: 885-94.
8. Azam M, Aftab M, Suleman T, Ashraf AS, Shafi F. Efficacy of Levofloxacin in Hospital admitted cases of Community Acquired Pneumonia (CAP). Pakistan Journal of Medical and Health Sciences 2012; 6: 929-32.
9. multidimensional image display and analysis. Proc SPIE. 1992;1660:694–711.
10. Black-Shinn JL, Kinney GL, Wise AL, Regan EA, Make B, Krantz MJ, et al. Cardiovascular disease is associated with COPD severity and reduced functional status and quality of life. COPD. 2014;11:546–551.
11. Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, Calverley P, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Respir Crit Care Med. 2007;176:532–555.