



Prevalence of Recurrent Hospital Admission in Children with Recurrent Wheezing in Babylon Province

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Abstract

Edited by: Ksenija Bogoeva-Kostovska
Citation: Falah S, Mukhlif SF, Degan A. Prevalence of Recurrent Hospital Admission in Children with Recurrent Wheezing in Babylon Province. Open Access Maced J Med Sci. 2022 Jan 20; 10(B):168-172. <https://doi.org/10.3889/oamjms.2022.8223>
Keywords: Prevalence; Recurrent hospital admission; Children; Recurrent wheezing; Babylon province
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Received: 10-Dec-2021
Revised: 04-Jan-2022
Accepted: 10-Jan-2022
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Funding: This research did not receive any financial support
Competing Interests: The authors have declared that no competing interests exist
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BACKGROUND: Occurring of recurrent wheezing attacks signify a significant healthcare problem and considered one of the most common causes of emergency unit admission and hospitalizations.

AIM: The aim of study is to determine the associations of recurrent hospital admissions in children with recurrent wheezing.

METHODS: Cross-sectional descriptive study of 102 children with recurrent wheezy chest. Data collected from admitted patients with recurrent wheezing by direct interview with the patients' families. Patients were 6 months to 5 years old. Data collected including age, gender, place of living whether urban or rural, prematurity, no. of people at home, history of NCU admission, history of ICU admission, exclusive breast feeding for 1st 6 months, anemia, GERD, history of atopy, exposure to smoking, inhaler use, and CXR findings.

RESULTS: About 79.41% of children have 1-3 times admission in hospital, significant association between the no. of hospitalization and History of ICU admission, children with more than 3 times admission to hospital present with GERD with significant association. Significant association with more than 3 times admission to hospital have previous history of exposure to smoking, inhaler use and X-ray finding.

CONCLUSION: One to three years old children is the most common age they have recurrent wheezing, most children with recurrent wheezy chest have more than 3 times hospitalization, most babies have previous history of ICU admission, GERD and exposure to smoking.

Introduction

Occurring of recurrent wheezing attacks signify a significant healthcare problem and considered one of the most common causes of emergency unit admission and hospitalizations. 1-3 children have at minimum one severe wheezing attack beforehand the age of 3 years [1]. Repeated wheezing can cause a chief financial problematic subsequent from the healthcare cost equivalent with the illness [2], [3]. Whereas the most public reasons of repeated wheezing is "asthma, gastroesophageal reflux disease (GER), foreign body aspiration, bronchopulmonary dysplasia (BPD), bronchiolitis obliterans, an immunodeficiency, primary ciliary dyskinesia, vocal cord dysfunction, cardiac and structural etiologies" [1]. Early life wheezing represents a common condition described by airways obstruction [4]. Wheezing is a common problem internationally, bronchiolitis and asthma being the most common causes of wheezing in preschool children [1], [5]. Infants with recurrent wheezing their parents always ask the doctor if their baby will develop asthma in future. Appropriate documentation of children at danger of developing asthma at school age may expect long-term consequences and recover management and

protective method, but the opportunity to recognize these children at preschool age still inadequate [1]. While most of the patients predictable to recover and to be symptom-free at the age of 6 years and the bulk of them continue asymptomatic at the age of 11–16 years [6]. The aim of study is to determine the associations of recurrent hospital admissions in children with recurrent wheezing.

Methods

Cross-sectional descriptive study of 102 children with recurrent wheezy chest, the study done at Babylon Teaching Hospital for Children and Maternity, along a period from October 2020 to June 2021. Data collected from admitted patients with recurrent wheezing by direct interview with the patients' families. Patients were 6 months to 5 years old. Data collected including age, gender, place of living whether urban or rural, prematurity, no. of people at home, history of NCU admission, history of ICU admission, exclusive breast feeding for 1st 6 months, anemia, GERD, history of atopy, exposure to smoking, inhaler use, and CXR findings. Exclusion criteria include:

1. Patients with chronic lung disease
2. Patients with cerebral palsy on nasogastric tube feeding
3. Patients less than 6 months of age
4. Patients with first time admission

Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean, median and SD for continuous data. Chi-square used for assessed association between variables, T test used for evaluation differences between mean and median of continues variables. $p \leq 0.05$ is considered significant.

Results

Cross-sectional study of 102 children with recurrent wheezing, (52.9%) of them at age group, 1–3 years old, (54%) of children are males, (51%) of babies in current study live in urban area, (93.1%) of children have more than 3 persons live with them in house, (13.7%) of babies are premature, also in current study show (48%) of them have previous history of neonatal care unit (NCU) admission, this study show (16.7%) of children have previous history of intensive care unit (ICU) admission, just (35.3%) of them have history of breast feeding exclusive for 6 months, present study show that (36.3%, 31.4%, 42.2%, 30.4%, 33.3%, 9.8%, and 5.9%) of children have anemia, GERD, history of atopy, exposure to smoking, inhaler use, abnormal chest X-ray and congenital heart disease, respectively, as shown in Table 1.

Figure 1 shows the children distribution according to no. of hospitalization. (79.41%) of children has 1–3 times admission in hospital.

There is significant association between the no. of hospitalization and history of ICU admission, (71.4%) of children with more than 3 times admission to hospital have previous history of intensive care unit, also this study show (90%) of children with more than 3 times admission to hospital present with GERD with significant association. Significant association of (71.4%) of children with more than 3 times admission to hospital have previous history of exposure to smoking; the results of this study show (61.9%) of babies that have no. of hospitalization more than 3 times inhaler use. 57.1% of children with more than 3 times admission to hospital show significant hyperinflation X-ray finding (Table 2).

Discussion

In the present study, most of children with recurrent wheezy chest are at age group 1–3 years

Table 1: Frequency and percentage of variables in the present study

Variables	Frequency	Percentage
Age (year)		
<1	10	9.8
1–3	54	52.9
3–5	38	37.3
Gender		
F	46	45.1
M	56	54.9
Place of living		
Rural	50	49.0
Urban	52	51.0
No. of people in home		
3 and less	7	6.9
>3	95	93.1
Prematurity		
Yes	14	13.7
No	88	86.3
History of NCU admission		
Yes	49	48.0
No	53	52.0
History of ICU admission		
Yes	17	16.7
No	85	83.3
History of breast feeding exclusive for 6 months		
Yes	36	35.3
No	66	64.7
Anemia		
Yes	37	36.3
No	65	63.7
GERD		
Yes	32	31.4
No	70	68.6
History of atopy		
Yes	43	42.2
No	59	57.8
Exposure to smoking		
Yes	31	30.4
No	71	69.6
Inhaler use		
Yes	34	33.3
No	68	66.7
Chest X-ray finding		
Hyperinflation	21	20.6
Hyperinflation and pneumonia	7	6.9
Normal	71	69.6
Pneumonia	3	2.9
Heart disease		
No	96	94.1
PDA	1	1.0
Small ASD	2	2.0
Small PDA	1	1.0
Small VSD	2	2.0

old, and most of them were boys live in urban areas this supported by studies have stated that boys have high risk of early insistent wheezing and allergic sensitization and most of babies at age 14 months [1], [5], [7]. Furthermore, Sebnem *et al.*

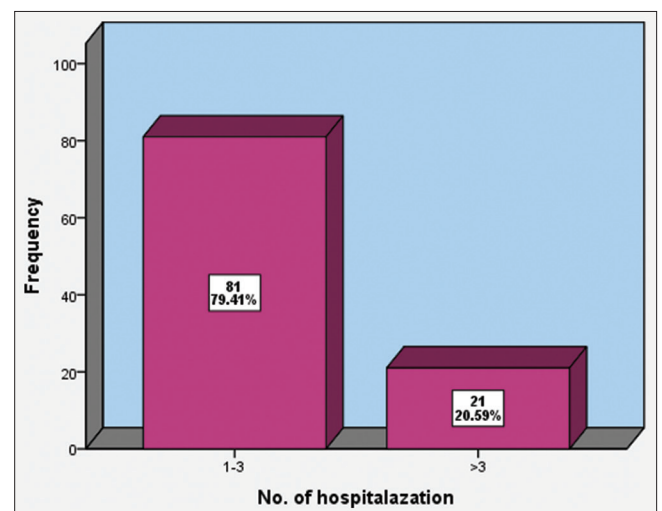


Figure 1: Children distribution according to no. of hospitalization

supported current results that no. of people live with children are more than 4 [1]. The present study reveal that 79% of patients admitted one to 3 times to hospital due to recurrent wheezing and shortness of breath this results also compatible with results done by Sebnem *et al.* that show no. of admission to hospital are 2 [1]. In the present study there is no significant association between (weight, age, gender and living place, prematurity) of children and no. of recurrent admission to hospital, this is agreed with other results show no significant association [1], [8]. Breastfeeding defends against respiratory tract

infections during early life. Whereas there are systematic studies significant, that breastfeeding act as defense against wheezing, while other studies have not seen any association. In the present study, we unsuccessful to recognize any association between breastfeeding and repeated wheezing, due to little sample size. This results agreed with other results have the same value [9], [10]. Smoking has a strong relationship with repeated wheezing [11], [12]. In the present study, we find significant association between recurrent hospitalization of babies and exposure to smoking (71%) of children with more than 3 times admission have exposure to smoking. British Cohort Study supported our results show a strong association between maternal smoking and the incidence of wheezing during early children's life [13]. During prenatal period, maternal smoking has effects on the fetus lung function and increases the danger of wheezing at 3 years of life [14]. In the present study, there is no association between recurrent hospitalization and presence of anemia in babies, other results show association between anemia and lower respiratory infections. Iron deficiency anemia disturbs the immune response and alterations the metabolism of pathogens. A low tissue hemoglobin level weakens tissue oxygenation and signifies a danger for respiratory infections in children [15], [16]. These differences due to small sample size taken in our results. In the present study, there is highly significant association between more than 3 times admission and GERD considered as risk factors of recurrent hospitalization due to recurrent wheezing 19 babies more than 3 times admission have history of GERD, this is supported by many studies that show significant association. A study discovering the association between the reappearance of respiratory symptoms and GER, observed GER in 35% of the patients. An obvious lowering in wheezing attack observed 3–6 months after anti-reflux treatment. Patra *et al.* demonstration that 42% of the wheezy patients under the age of 1 year had positive GER investigations. They description that GER is a significant cause of recurring wheezing in patients under 2 years of age and commend GER examinations in patients with severe occurrences having an onset under the age of 1 year [17], [18]. In current study, we find significant association between recurrent hospitalization of babies and inhaler uses, salbutamol syrup remnants in use for the management of wheezing and babies that have more than 3 times admission to hospital associated with inhaler used, this is agreed with other studies that show the same association [1], [19]. In present study, there is no significant association between recurrent hospitalization of babies and babies' history of neonatal care unit admission and cardiac disease, but significant association between recurrent hospitalization of babies and babies' history of intensive care unit admission, (71%) of babies with more than 3 times admission have positive history of

Table 2: Association between variables in current study and no. of hospitalization

Variables	No. of hospitalization		p-value
	1-3	>3	
Weight (kg)			
Mean \pm SD	12.97 \pm 3.2	14.37 \pm 4	0.096
Age (years)			
<1	10 (12.3%)	0 (0%)	0.19
1-3	43 (53.1%)	11 (52.4%)	
3-5	28 (34.6%)	10 (47.6%)	
Total	81 (100%)	21 (100%)	
Gender			
Female	37 (45.7%)	9 (42.9%)	1.000
Male	44 (54.3%)	12 (57.1%)	
Total	81 (100%)	21 (100%)	
Place of living			
Rural	36 (44.4%)	14 (66.7%)	0.088
Urban	45 (55.6%)	7 (33.3%)	
Total	81 (100%)	21 (100%)	
Prematurity			
Yes	9 (11.1%)	5 (23.8%)	0.16
No	72 (88.9%)	16 (76.2%)	
Total	81 (100%)	21 (100%)	
History of NCU admission			
Yes	42 (51.9%)	7 (33.3%)	0.15
No	39 (48.1%)	14 (66.7%)	
Total	81 (100%)	21 (100%)	
History of ICU admission			
Yes	2 (2.5%)	15 (71.4%)	0.0001
No	79 (97.5%)	6 (28.6%)	
Total	81 (100%)	21 (100%)	
Breast feeding			
Yes	29 (35.8%)	7 (33.3%)	1.000
No	52 (64.2%)	14 (66.7%)	
Total	81 (100%)	21 (100%)	
Anemia			
Yes	30 (37%)	7 (33.3%)	0.8
No	51 (63%)	14 (66.7%)	
Total	81 (100%)	21 (100%)	
GERD			
Yes	13 (16%)	19 (90%)	0.0001
No	68 (84%)	2 (9.5%)	
Total	81 (100%)	21 (100%)	
History of atopy			
Yes	36 (44.4%)	7 (33.3%)	0.46
No	45 (55.6%)	14 (66.7%)	
Total	81 (100%)	21 (100%)	
Exposure to smoking			
Yes	16 (19.8%)	15 (71.4%)	0.0001
No	65 (80.2%)	6 (28.6%)	
Total	81 (100%)	21 (100%)	
Inhaler use			
Yes	21 (25.9%)	13 (61.9%)	0.004
No	60 (74.1%)	8 (38.1%)	
Total	81 (100%)	21 (100%)	
Chest X-ray			
Hyperinflation	9 (11.1%)	12 (57.1%)	0.0001
Hyperinflation and pneumonia	1 (1.2%)	6 (28.6%)	
Normal	69 (85.2%)	2 (9.5%)	
Pneumonia	2 (2.5%)	1 (4.8%)	
Total	81 (100%)	21 (100%)	
No. of people			
3 and less	7 (8.6%)	0 (0%)	0.34
>3	74 (91.4%)	21 (100%)	
Total	81 (100%)	21 (100%)	
Heart disease			
No	76 (93.8%)	20 (95.2%)	0.27
PDA	0 (0%)	1 (4.8%)	
Small ASD	2 (2.5%)	0 (0%)	
Small PDA	1 (1.2%)	0 (0%)	
Small VSD	2 (2.5%)	0 (0%)	
Total	81 (100%)	21 (100%)	

p \leq 0.05 (significant).

intensive care unit admission, this is similar to study done in UK also show the same association [20]. Furthermore, in present study, most children frequently admitted to hospital due to recurrent wheezing have hyperinflation finding in X-ray (57%), this agreed with Halaby *et al.* that show the babies with recurrent wheezing that frequently admitted to hospital is due to bronchitis or asthma this appears as hyperinflation on chest X-ray [21].

Conclusion

One to three years old children is the most common age they have recurrent wheezing, most of them are males and they live in urban area, most children with recurrent wheezy chest have more than 3 times hospitalization, most babies with recurrent admissions due to recurrent wheezing attack have previous history of ICU admission, have GERD and have high exposure to smoking. Due to shortness of breath, children who use inhaler have more times hospitalization, with hyperinflation X-ray finding.

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