

Clinical evaluation of wheezy chest in children below 2 years of age in Hawler governorate

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Abstract

Background and objectives: Acute respiratory tract infection is a leading cause of childhood morbidity & mortality in developing countries .respiratory distress with wheezing in infants is quite common & presents substantial diagnostic problems. The aim is to determine the clinical characteristics of wheezy chest in children below 2 years of age in Raparin pediatric hospital in Hawler Governorate

Methods: a prospective study conducted between 1st of January till 1st of June 2007 in Ra-preen hospital , three hundreds children of 1-24 months old admitted with respiratory distress & acute wheezing were recruited & 62 children with no respiratory distress were also studied as control cases. Chest x-ray, total & differential WBC counts were undertaken for all of them.

Results: of the 300 cases, 191 were due to bronchiolitis .thier age were between 1-6 months (47.23 %), male was the most common gender affected (67.67%).Fever with temperature above 37.7 C° indicate pneumonia (68.9%) more likely rather than other 2 diseases (asthma ,bronchiloitis). One hundred percent of cases of asthma had history of previous attack of wheeze & +ve family history of atopy.Among bronchopneumonia patients,77% had opacity in chest x-ray(CXR) while 39.9% of bronchiolitis cases had normal CXR. In 84.8 % of cases with bronchiolitis WBC count were normal with only 4.2% had lymphocytosis ,while 11.5% of bronchopneumonia patients had leukocytosis with 24.6% of these cases had neutrophilia.

Conclusion: It can be concluded from this study that bronchiolitis ,bronchopneumonia & asthma can be differentiated up to reasonable extent on the basis of clinical features supported by simple available investigations..

Keywords: Wheezy child ,Bronchiolitis ,Bronchopneumonia ,Asthma

Introduction

Respiratory distress with wheezing in infants is quite common & presents substantial diagnostic problems¹; 20% of children under 5 years wheeze at some time & asthma is the commonest cause of wheezing. ² Bronchiolitis is usually caused by viral infection, most commonly respiratory syncytial virus (RSV). RSV infection are responsible for more than half of all cases of the illness & are most widespread in the winter & early spring .There is no evidence of a bacterial cause for bronchiolitis. ^{3,4,5} Bronchopneumonia refers to inflam-

mation of lung that is centered in the bronchioles & lead to the production of mucopurulent exudates that obstructs some small airways ⁴, viral infections are more common but bacterial infection are more severe⁵. Asthma is a chronic disease of reversible airway obstruction characterized by bronchial hyper responsiveness, inflammation & mucus secretion. ^{3,5,7} In bacterial infections such as pneumonia the fever is usually high while in bronchiolitis it is rarely above 38 °C ^{2,8} Chest x-ray findings like overinflated lung fields suggest likely diagnosis of asthma while hyperinfla-

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tion with patchy infiltrates & atelectasis suggest bronchiolitis & lobar consolidation suggest bacterial pneumonia. WBC (White blood cells) count > 20 000 with neutrophilia suggest bacterial pneumonia^{8,9} while normal WBC & differential count is the usual finding in bronchillitis.³

Methods

This prospective study was conducted among 300 children selected randomly of 1 - 24 months old of both sexes in pediatric teaching hospital presenting with respiratory distress & chest wheezing during the period from 1st of January – 1st of June 2007. Cases of foreign body inhalation, congestive cardiac failure, congenital heart disease, and lobar pneumonia, congenital malformations of the airway, croup and pulmonary tuberculosis were excluded after detailed history & clinical examination. A sample size of 300 was estimated to describe the clinical characteristics of wheezy child in children by detailed history & physical examination. General examination & respiratory system examination were performed. Corrected axillary temperature was taken for all patients at time of examination during 1st 24 hours of admission & temperature of $\geq 37.7^{\circ}\text{C}$ considered to be febrile¹⁰. Erect chest X-ray (CXR), Total & differential WBC including absolute neutrophil & lymphocyte count were done for all cases. Sixty two control cases with no dyspnea & with no evidence of infection were taken randomly from pediatric surgical unit preoperatively mostly for inguinal hernia, circumcision, undescended testis, hydrocele etc. Total & differential count including absolute count & chest x-ray were done for all cases. The data were collected & entered into SPSS version 11.5; parametric tests were used for normally distributed & non parametric tests for skewed data. P value less than 0.05 considered significant. Many recruited cases were excluded after questionnaires were completed due to inadequate blood sample or parental refusal of take blood sample for their children.

Results

Most cases were initially diagnosed as bronchiolitis as shown in (Figure 1) All conditions were common in the first 6 months of life as shown in (Figure 2) & most cases were male as in (Figure 3) all were statistically highly significant ($p= 0.00$). Difference in temperature readings were statistically significant ($p= 0.00$), High temperature ($\geq 37.7^{\circ}\text{C}$ or 100F) found in 68.8% of pneumonia patients at time of examination in the hospital as shown in (Figure 4) & nearly all cases had history of cough as shown in (Figure 5) ($p =0.01$). Most patients with wheezy chest had another first degree relative with ARI as shown in table.6 & was statistically significant compared to control ($p= 0.00$). History of previous attack of wheeze & positive family history of atopy in other family members of first degree found in 100% of cases of asthma as shown in (Figure 7) & (Figure 8) which both are statistically significant (both $p =0.00$). As shown in (Figure 9), the most common radiological finding among patients with pneumonia is opacity in CXR while most patients with asthma & bronchiolitis have normal CXR. Most of patients have normal WBC count as shown in (Figure 10), with normal differential count of neutrophil, lymphocyte, eosinophil in most patients but increase in the frequency of patients with neutrophilia in bronchopneumonia cases, & increase in frequency of patients with eosinophilia in asthma cases as shown in (Figure 1).

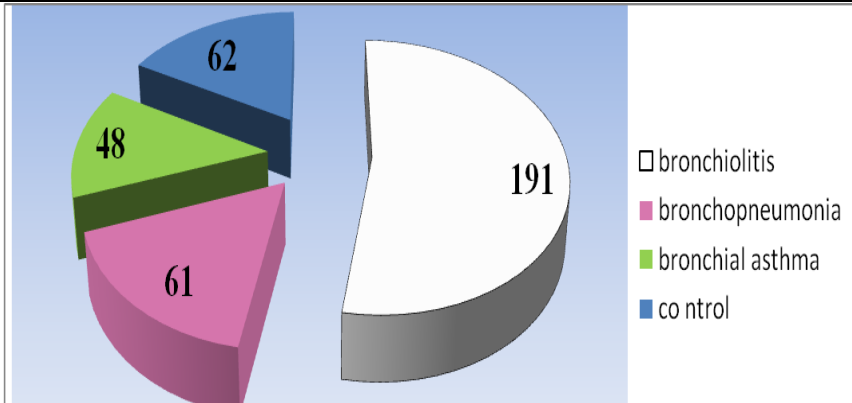


Figure 1: Provisional diagnosis of wheezy child.

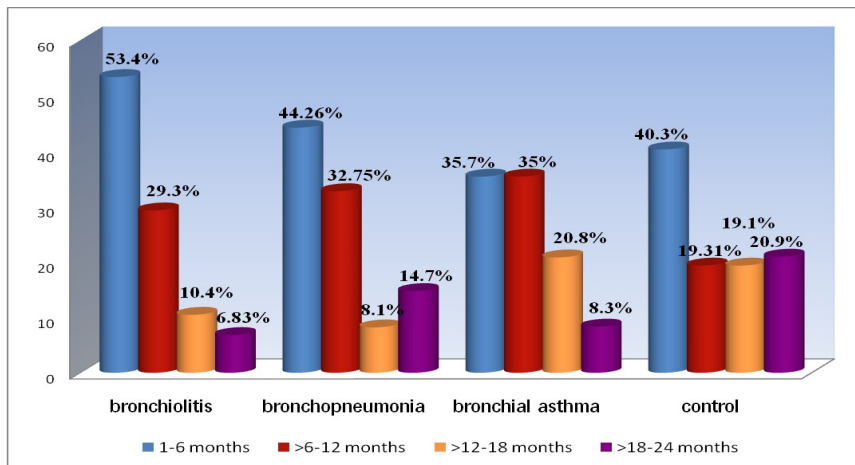


Figure 2: Age distribution of wheezy child & control cases

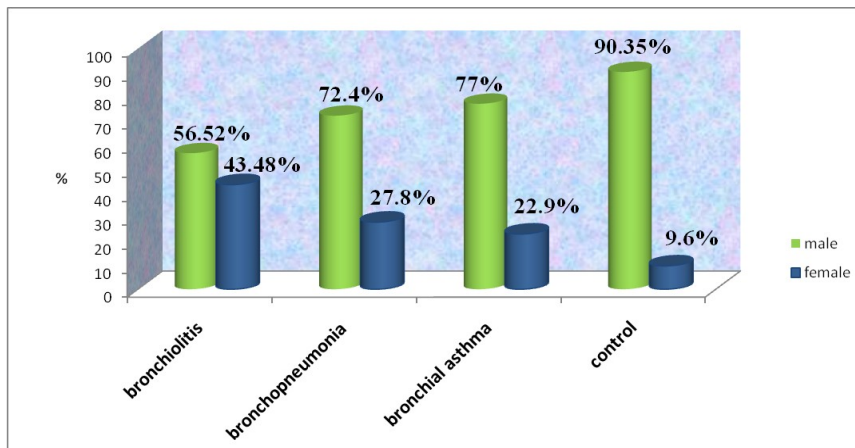


Figure 3: Gender distribution of wheezy child & control cases

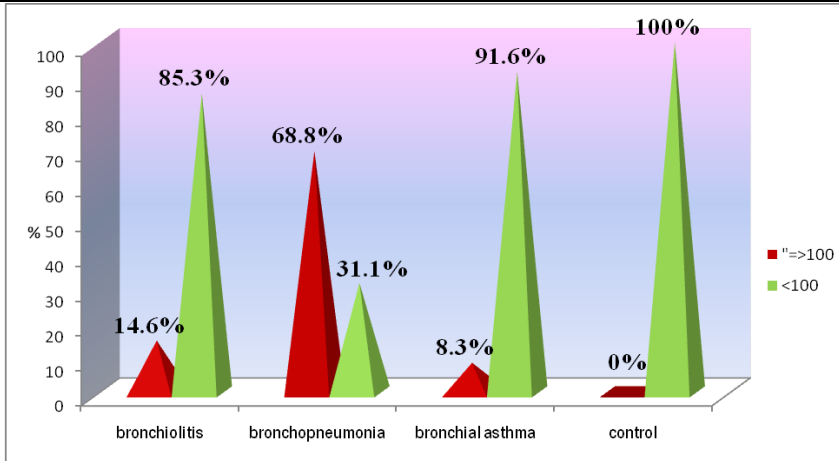


Figure.4 : temperature at time of examination of wheezy child & control cases

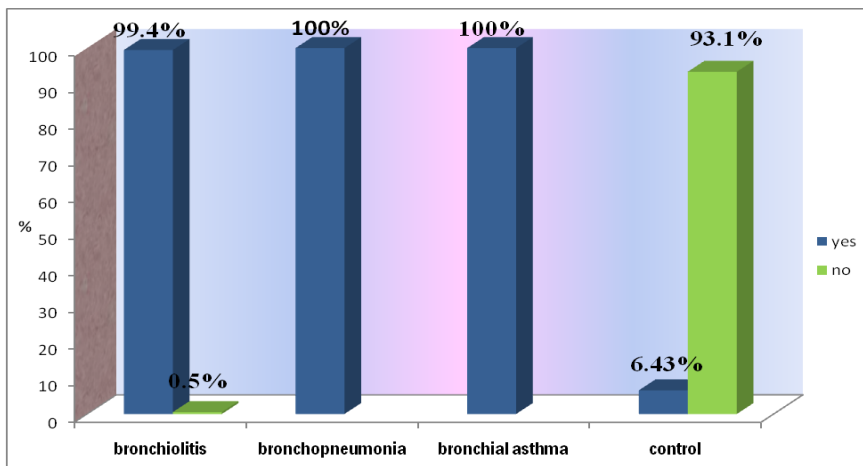


Figure.5: Cough in wheezy child & control cases

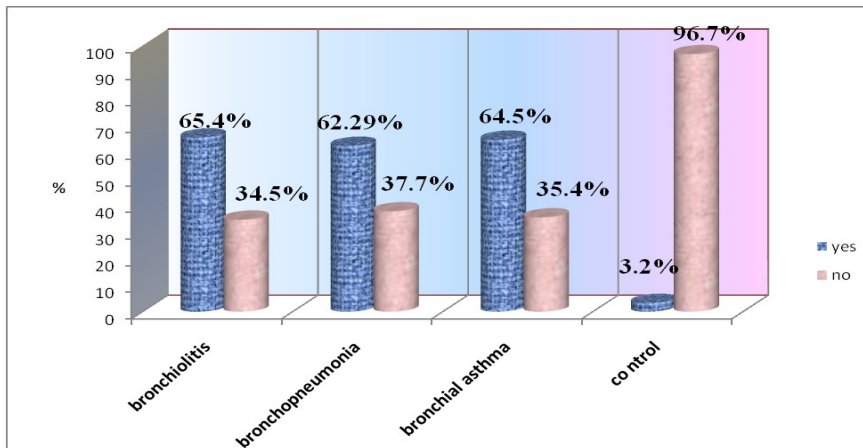


Figure 6: Family history of ARI in other family members

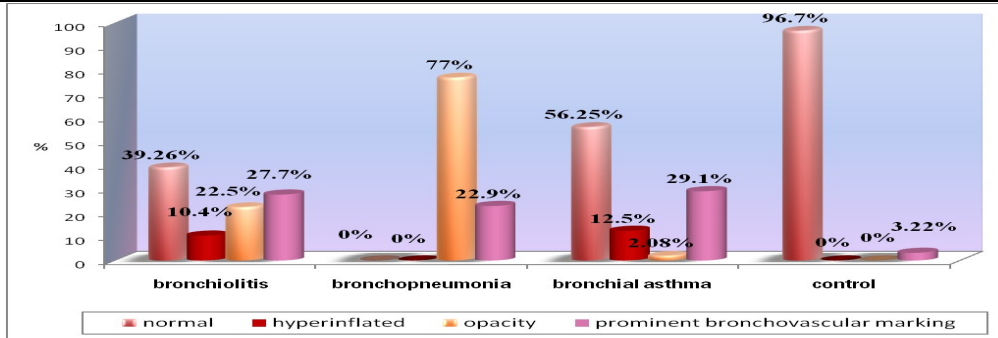


Figure 7: Previous history of wheeze in wheezy child

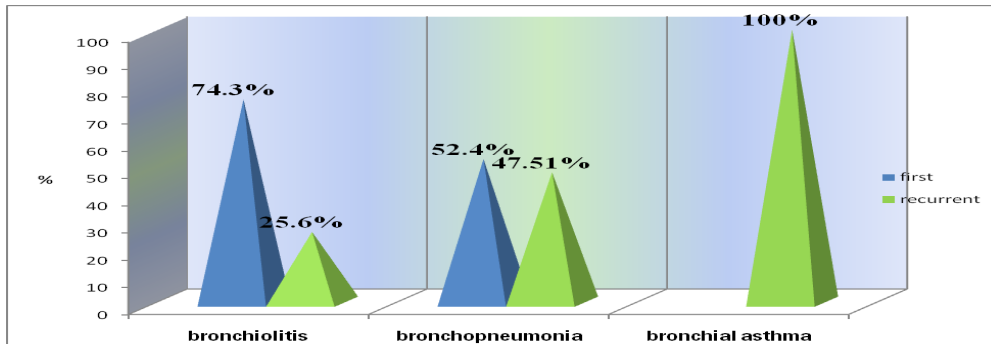


Figure 8: Family history of atopy in wheezy child & control cases

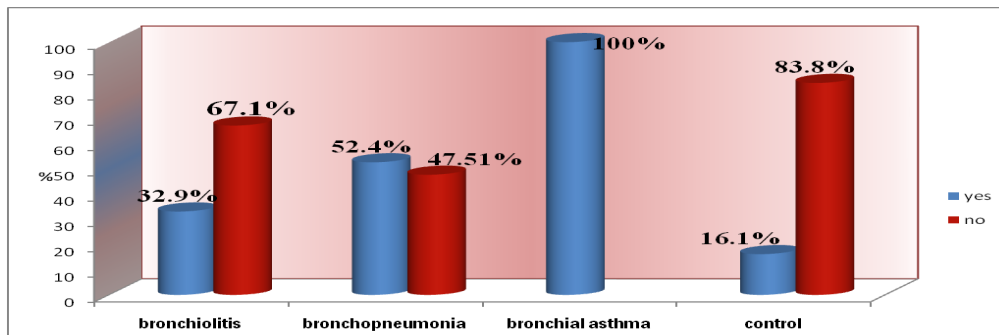


Figure 9: X-ray findings in Wheezy child & control cases

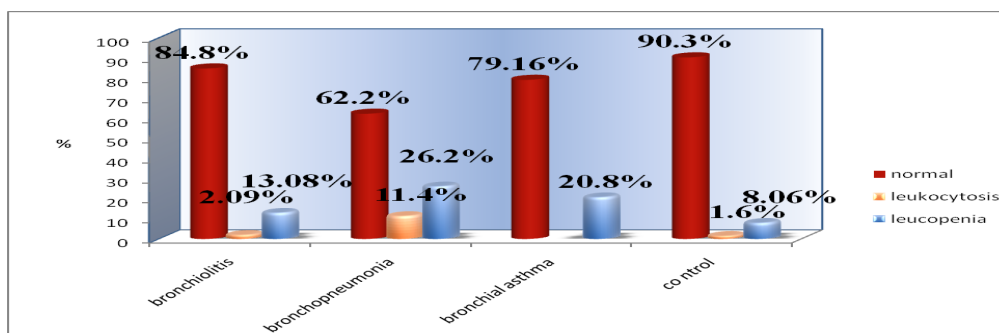


Figure 10 : Total WBC count in wheezy child & control cases

Table 1: differential WBC of wheezy child & control cases.

		Bronchiolitis	Pneumonia	Asthma	Control	Total
Absolute lymphocyte count						
Normal	Count	157	39	33	53	282
	%	82.19%	63.93%	68.75%	85.48%	77.9%
Lymphocytosis	Count	8	3	2	1	14
	%	4.19%	4.91%	4.17%	1.61%	3.86%
Lymphopenia	Count	26	19	13	8	66
	%	13.61%	31.14%	27.08%	12.9%	18.23%
Total	Count	191	61	48	62	362
	%	100%	100%	100%	100%	100%
Absolute neutrophil Count						
Normal	Count	174	40	44	53	311
	%	91.09%	65.57%	91.66%	85.48%	85.91%
Neutrophilia	Count	5	15	0	0	20
	%	2.62%	24.57%			5.52%
Neutropenia	Count	12	6	4	9	31
	%	6.28%	9.83%	8.33%	14.51%	8.56%
Total	Count	191	61	48	62	362
	%	100%	100%	100%	100%	100%
Absolute eosinophil Count						
Normal	Count	180	59	41	54	334
	%	94.24%	96.72%	85.41%	87.09%	92.26%
Eosinophilia	Count	11	2	7	8	28
	%	5.75%	3.27%	14.58%	12.9%	7.73%
Total	Count	191	61	48	62	362
	%	100%	100%	100%	100%	100%

Note: % taken within the initial provisional diagnosis

DISCUSSION:

The study group were 1 month to 24 months old & bronchiolitis constitute 53.4% & most were between 1-6 months ,this agrees with other studies ^{3,4,7,11} where peak incidence of bronchiolitis were betw-

een 3-6 months of age. In this study, 85.3% of bronchiolitis cases had no fever while 68.9% of bronchopneumonia cases had fever & this result agrees with another study ¹ which shows 88% of bronchopneumonia patients had fever & 67.7% of bronchiolitis patients had no fever. A history of

cough was more common with 99.5% in bronchiolitis & 100% in bronchopneumonia & bronchial asthma, this nearly confined to a study done in Erbil where cough found in 100% of patients with bronchiolitis, bronchopneumonia & bronchial asthma. & this confirms that cough is major symptom for children with wheezy chest.¹² Most cases of bronchiolitis had history of URTI in other family members. older family members are a common source of infection but may experience only minor respiratory symptoms⁵. Recurrent attacks or past history of similar wheezing episodes was observed in 100% infants who had bronchial asthma which is similar to other studies.^{1,13} All cases of bronchial asthma had family history of atopy in this study. Family history of asthma or other allergic disorders was observed to be an important criteria for diagnosis of bronchial asthma as shown by Naresh et al.¹ Chest X-ray findings of bronchiolitis (39.3% normal, 10.5% hyperinflation, 22.5% opacity & 27.7% prominent bronchovascular markings) fit with another study¹ were 35.3% ,44.2% & 20.5% had opacity ,hyper inflation & prominent bronchovascular markings respectively. In patients with broncho-pneumonia (77% opacity , 23% prominent bronchovascular markings), this result is lower than a study¹ showed 100% opacity. In bronchial asthma (56.3% normal ,12.5% hyperinflation, 2.1% opacity & 29.2% prominent bronchovascular markings) which also confined with a study¹ showed 25% hyperinflation , 31.2% prominent bronchovascular markings & 43.8% had normal. Most cases of bronchiolitis had normal total WBC count which was in agreement with Goodman² in which white blood count were normal while 11.5% of bronchopneumonia & no one of bronchial asthma had leukocytosis. Only few cases of bronchiolitis ,asthma & pneumonia had lymphocytosis which is also in agreement with Naresh et al¹ who showed lymphocytosis only in 5.8% for bronchiolitis & 0% for broncho-pneumonia & bronchial asthma .Relatively, broncho-pneumonia more likely than asthma &

bronchiolitis to have neutrophilia , these results coincide with Korppi M et al¹⁴ & Naresh et al¹ regarding bronchiolitis & bronchial asthma but not for bronchopneumonia (100% had neutrophilia) compared to our result 24.6%. Eosinophilia present in only 14.6% of patients with asthma compared to 68.7% showed in a study done in India¹ at 2001.

Conclusions:

Presence of fever, neutrophilia & opacities in the chest X ray point to the diagnosis of bronchopneumonia while absence of fever with normal leukocyte count or lymphocytosis point towards bronchiolitis in young children with respiratory distress & chest wheezing. Recurrent attacks with positive family history of bronchial asthma & allergic disorders & eosinophilia suggest diagnosis of bronchial asthma in young childrens with respiratory distress & chest wheezing .

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