

A Comparative Study to Determine the Effect of Bronchitis in Children on Episodes of Respiratory Infections

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Abstract: This paper aims to determine the effect of bronchitis in children on episodes of respiratory infections. In this research, 174 children from different hospitals in Iraq were included, distributed over ages ranging from 2-8 years, and the most frequent work in this study was for the age of 6 years for 35 patients in the patient's group and 20 cases in the control group. In this study, 174 children were recruited, and they were divided into two groups, 100 children in the patient group and 74 in the control group. Patients were evaluated using several scales as (Score Acute respiratory illness Group patient CARIFS) and as (assessment outcomes of patient study according to cough scores). the results were found on days 7 and 20 of illness, children with bronchitis had significantly higher median CARIFS when compared with children control at 30.6 ± 2.3 for a 2-year-old, and the study discovered an inverse relationship between the quality of life in addition to the initiation of symptoms of respiratory infections with the length of the period for patient children with a statistical significance p -value < 0.05 .

Keywords: Bronchitis, Respiratory Infections Acute bronchitis pathophysiology.

INTRODUCTION

Acute bronchitis, from a pathophysiological point of view, refers to acute inflammation of the bronchial mucosa. Clinically, it is not well defined, but it is a respiratory tract infection of viral etiology that usually lasts no more than two weeks. Most authors agree that coughing, with or without expectoration, is the most common symptom [Collins, P.L. *et al.*, 2007; Toivonen, L. *et al.*, 2016; Mufson, M.A. *et al.*, 1985]

Respiratory viruses are responsible for most cases of acute bronchitis.

In children over five years of age, it can also be caused by Mycoplasma pneumonia and Chlamydia pneumoniae [Cane, P.A. *et al.*, 1991; Storch, G.A. *et al.*, 1991]

Other accompanying signs or symptoms of greater or lesser frequency are fever, malaise, hoarseness, chest pain, and shortness of breath. [Peret, T.C. *et al.*, 1998; Korppi, M. *et al.*, 2004]

Respiratory syncytial virus (RSV) is the most frequently detected virus in children with bronchiolitis, followed by rhinovirus, bocavirus (HBoV), adenovirus, metakinesis (hMPV), influenza viruses less frequently. [Escobar, G.J. *et al.*, 2010; Carroll, K.N. *et al.*, 2009]

The manifestations of infection are due to the direct cellular effect of the virus on the cells of the respiratory epithelium and the immune response of the host. [Nair, H. *et al.*, 2013]

After a brief incubation period, the clinical picture begins with upper respiratory symptoms such as runny nose and cough, and are usually not very high. In a period of 1 to 4 days, the cough becomes more persistent, with the appearance of irritability, lack of appetite, and shortness of breath [Chen, J. *et al.*, 2009]

Acute respiratory infections, which are among the leading causes of death among children in most developing countries, represent the next challenge that health services will face with regard to comprehensive child care, as the death rate from preventable diseases, vaccines, and diarrheal diseases has decreased significantly in recent years. [Stern, D.A. *et al.*, 2008; W.H.O, 2016]

The impact on mortality through a control program is primarily dependent on the appropriate management of ARI cases through early identification of children with ARI and early diagnosis of pneumonia, as well as correct and effective therapeutic management. [Harterter, H.K. *et al.*, 2000]

MATERIAL AND METHOD

Collection Sample

The current clinical was a cross-sectional comparison, randomized to children aged between 2-8 years, where information and demographic data were collected from different hospitals in Iraq to patients with bronchitis with cough for 100 patients and a control group for 74 controls

A study was conducted according to clinical practice guidelines and involved 174 patients. The study protocol, patient information, and informed consent form were approved by the ethics committee with a full-year study period ranging from (9-8-2020 to 9-9-2021)

Written informed consent was obtained from all patients prior to commencing all study-related activities.

METHODOLOGY

In this study, 174 children were recruited, and they were divided into two groups, 100 children in the patient group and 74 in the control group.

Patients were evaluated using several scales as Score Acute respiratory illness Group patient CARIFS.

Where the scale consisted of 18 items, the most prominent of which was the measure of cough severity in addition to the functional criteria for patients, and the scale score was 40 (0-10 indicates no problem) (10-20 simple problems) (20-30 moderate problems) (30-40) big problems.

As assessment outcomes of patient study according to cough scores

Where the cough diary included several questions, and it was evaluated from 5, as the entire degree of evaluation increased, indicating the presence of host problems, in addition to the frequent coughing of patients).

The data were analyzed according to spss IBM soft 22, where the true value and standard regression were found, in addition to the identification of the type of statistical relationships between the two groups.

RESULTS

Table 1: Distribution of patients according to age

Age	Patient frequency	Control frequency	P-value
2	5	3	0.66
3	8	6	0.04
4	10	14	0.66
5	20	15	0.05
6	35	20	0.001
7	12	10	0.87
8	10	6	0.77
Total	100	74	174

P-value: a number calculated from a statistical test

Table 2: Distribution of patients according to sex

Age	Patient frequency		Control frequency	
	Boys	Girls	Boys	Girls
2	4	1	1	2
3	5	3	4	2
4	6	4	10	4
5	13	7	9	6
6	20	15	14	6
7	9	3	5	5
8	5	5	3	3
Total	62	38	46	28

Table 3: Results of Score Acute respiratory illness Group patient

Age	D 20 (MEAN SD)	7 DAY (MEAN SD)	1 DAY (MEAN SD)
2	30.6±2.3	20.1±6.6	18.1±4.1
3	25.2±5.5	19.2±4.4	15.6±3.3
4	27.3±3.9	17.5±2.2	13.5±5.2
5	35±4.4	15±5.5	12.2±3.9

6	33±3.1	18±2.5	13.9±2.2
7	30.5±1.1	16.5±3.3	12.2±1.0
8	29±2.2	15.5±6.4	11.4±2.6

Mean ±SD: Mean ±Standard deviation

Table 4: Results of Score Acute respiratory illness Group control

Age	D1 (MEAN SD)	7 DAY (MEAN SD)	20 DAY (MEAN SD)
2	5.5±3.3	4.4±2.1	3.9±1.2
3	10.1±2.2	3.9±1.1	4.4±0.8
4	7.1±1.1	5.5±2.2	4.5±0.9
5	8.2±2.7	7.5±1.1	5.9±2.6
6	9.9±2.4	8.3±3.2	7.7±1.4
7	5.8±2.7	4.1±2.9	3.9±0.8
8	6.6±3.1	3.7±1.1	3.1±0.9

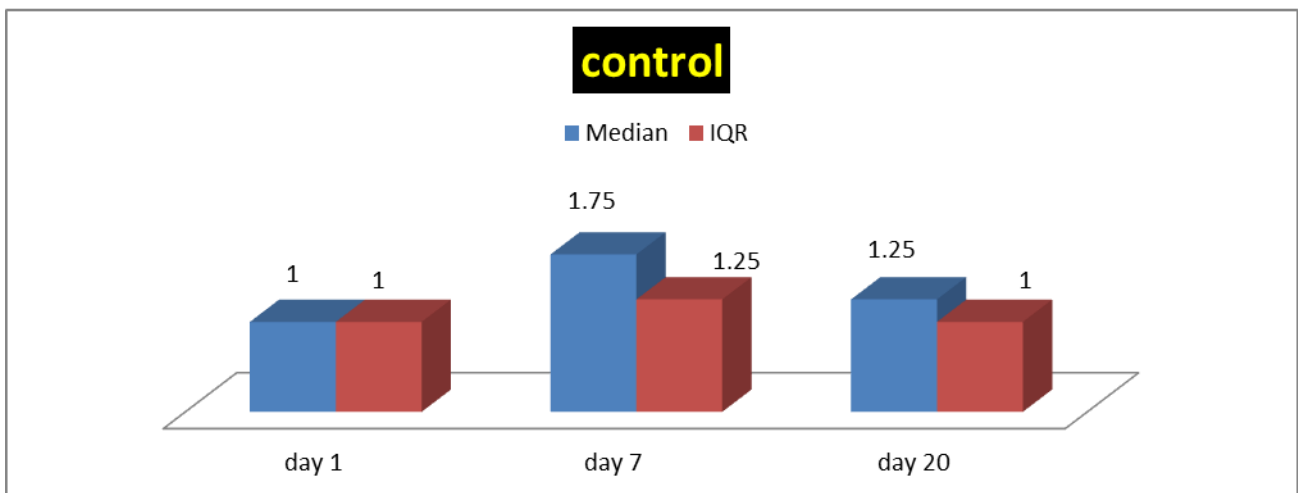
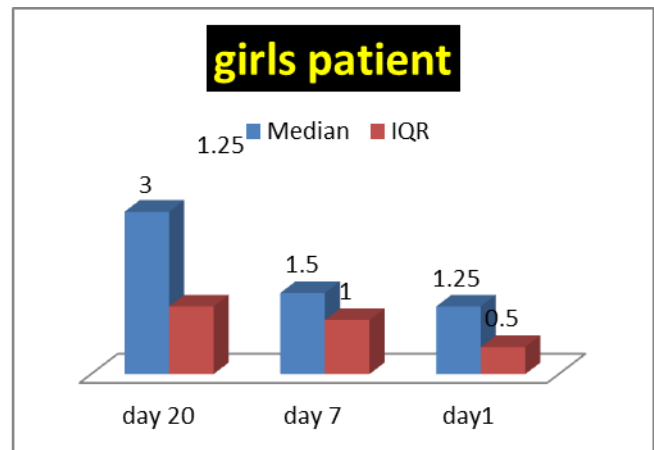
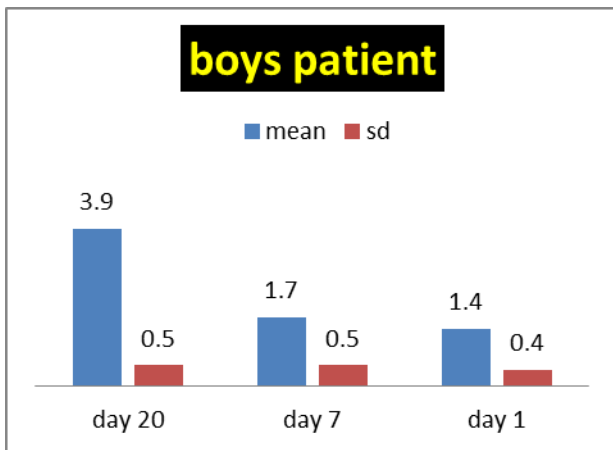


Fig 1: Outcomes of patient study according to cough scores

IQR = The interquartile range (IQR)

Table 5: Spearman rank correlations between Score Acute respiratory illness with severity

Items	Vas scale(quality of life)	CARIFS patient	CARIFS control
R correlation	1.00	-0.34	0.44
s-sig	----	0.28***	0.05
N		174	

VAS: Visual Analogue Scale, CARIS: Canadian Acute Respiratory Illness and Flu Scale

Table 6: Person rank correlation between cough scores and Child function items

Items	Child function items	cough scores patient	cough scores control
R correlation	1.00	-0.067	0.9*
s-sig	----	0.11*	0.001
N		174	

DISCUSSION

In this research, 174 children from different hospitals in Iraq were included, distributed over ages ranging from 2-8 years, and the most frequent work in this study was for the age of 6 years for 35 patients in the patient's group and 20 cases in the control group.

The patients were divided into two groups (patients 100 patients and 74 controls), and in this study, it was found that the prevalence of boy's patients is clearly more than girls for 62 patients in the group of patients and 46 in the control group

In this study, the CARIFS scale was used to find out the effect of the severity of the disease, acute respiratory infection, on the patients of this study.

The severity of respiratory tract infection was assessed for three stages (1 day - 7 days - 20 days), and it was found that the acute respiratory infection severity scale increased to pediatric patients between the age of 2-4 years, where the value of the standard regression and the mean was 30.6 ± 2.3 then The value gradually decreased at seven days and became 20.1 ± 6.6 for two years of age

As for the control group, wide differences were found in the severity of the disease according to the CARIFS scale, as the percentages ranged between 5-10 over all ages, and statistical differences were found between the two groups with a statistical significance p value < 0.05 .

An identical study was found to our study to Cannes and Weizen 2015, where 180 children were collected and distributed into two groups, 100 boys and 80 girls. 4-7 years and a positive relationship was found with the CARIFS scale, and this proves the validity of our study.

Several studies indicated a close association between bronchitis and respiratory disease and an important risk factor for complications in children, and its presence was independently associated with twice the risk at the age of 2-8 years.

In young and adult individuals, studies have shown similar results in patients with long-term follow-up. It should be noted that bronchitis has been

found to be directly correlated with episodes of respiratory infections.

Age at the onset of atopy can be a very influential factor in the incidence of bronchitis. In an Australian study, the development of atopy at an early age (before six years) was an important predictor of bronchitis progression.

inflammation in the bronchial wall develops; bronchospasm and shortness of breath increase, obstructive syndrome and chronic impairment of pulmonary ventilation develop.

The disease, in most cases, becomes complicated by persistent viral infections of the respiratory tract and the influence of external problem factors. [De Francisco, A. *et al.*, 1998; Behrman, R.E. *et al.*, 1996]

In Figure 1, the outcomes of the patient study were evaluated according to cough scores, where the study revealed that there were similar levels between the group of sick boys compared to girls for 3.9 ± 0.5 , $three \pm 1.25$, respectively, and when comparing the patient's group with the control group, it was observed Low coughing, and this generates an inverse relationship between the two groups. [Gern, J.E. *et al.*, 2005]

The significance level and the statistical relationship were confirmed outcomes of patient study according to cough scores through Spearman rank correlations between Score Acute respiratory illness with incision [Thomsen, S.F. *et al.*, 2009; Stensballe, L.G. *et al.*, 2009; Poorisrisak, P. *et al.*, 2020], And an inverse relationship was found with the group of patients at $r=-0.34$ with a p-value of 0.28^{***} And when analysing person rank correlation between cough scores and Child function items cough scores patient with $R = -0.067$

CONCLUSION

This study aimed to determine the effect of bronchitis in children on episodes of respiratory infections.

We conclude from this study there is an inverse relationship between the quality of life in addition to the severity of symptoms of respiratory infections with the length of the period for sick

children with a statistical significance p-value < 0.05.

Note

Interquartile range (IQR)

Describes the middle 50% of values when ordered from lowest to highest. To find the interquartile range (IQR), first, find the median (middle value) of the lower and upper half of the data. These values are quartile 1 (Q1) and quartile 3 (Q3). The IQR is the difference between Q3 and Q1.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Ismail, M.S., Hussein, A.M., Sadeq, V.Q. and Abdulkafi, A.Q. "A Comparative Study to Determine the Effect of Bronchitis in Children on Episodes of Respiratory Infections." *Sarcouncil journal of Medical sciences* 1.9 (2021): pp 17-22