Bronchitis among pediatric patients in Diyala: Description of prevalence, associated cause and risk factors

Done by

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Abstract

Background: Bronchitis is the inflammation of the bronchi (bronchial tubes) that carry air to the lungs. The inflammatory reactions may be caused by virus (e.g. Respiratory Syncytial Virus, Parainfluenza and Influenza Virus, Adenovirus, Measles Virus), as well as allergens, airborne particles, smoking and environmental pollutants. Bronchitis can be acute and short lived or chronic, In symptomatic bronchitis, the common symptoms are coughing, wheezing, breathlessness, chest congestion, mucus secretion, sore throat, chills and fever. In asymptomatic bronchitis not all of the above mentioned symptoms are noticed in all patients.keeping away from environmental pollutants, antibiotic treatment (in case of a secondary infection) and respiratory exercise may improve bronchitic conditions. Controversy remains regarding the usefulness of therapeutic agents like corticosteroids, β-agonists and anticholinergic for the treatment of bronchitis. Antiviral and immunoglobulin agents were also used by several investigators but with little success. A better understanding of the cellular and molecular mechanism of bronchitis can help to promote new drug development. The current study focus on the description of all the causes and risk factors that possible

Method: The study retrospectively evaluated 84 patients who had diagnosed with bronchitis in AL-Batoul Hospital for Obstetrics and Gynecology in Baquba/ Diyala/ Iraq between October 2023 to December 2023 .67 of them were less than 6 year old and 17 of them were between 6 to 12 year old . Data were collected using an especially designed questionnaire, history, and laboratory investigations

Results: There was 63 male and 21 female in the study, 54 of them were living in urban places with a higher pollution rate most of them had a family history of bronchitis which had a great impact on getting the infection. Smoking consider the most causative reason for developing a bronchitis and that seen in the study as 48 in the first age group and 12 in the second group had a family member who smoke. Winter was the most common season for developing bronchitis. Most of the infection was viral infection and mostly all the patients suffered from cough and

wheezing and almost all of them get treating with bronchodilator and antibiotics.

Conclusion: Bronchitis is one of the most serious disease of pediatric and cause hospitalization of the child so a complete history and accurate investigation is need to confirm the diagnosis of the disease and starting the right treatment to help the patient get better. Parents need to be educated about the disease and it risk factors and causes in order to avoid them as much as possible to prevent the child from getting the disease.

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((Chapter One))
Review of Literature

1.1. Introduction

Bronchitis, an inflammation of the bronchial tubes or bronchi, is a common element in various respiratory ailments. It encompasses distinct categories based on factors like duration - acute or chronic. Acute bronchitis develops rapidly, often with severe symptoms, but typically resolves within a few weeks. It can be caused by various respiratory viruses or bacterial infections. In contrast, chronic bronchitis is rare in children and can range from mild to severe, lasting for months to years. It leads to ongoing inflammation and excessive mucus production in the bronchial tubes, increasing the risk of bacterial infections such as pneumonia. Different types of inflammation and associated syndromes, like acute bronchitis and protracted bacterial bronchitis, contribute to the complexity of bronchitis.

Bronchitis occurs when the linings of the larger airways become inflamed, leading to swelling and redness. These airways, called bronchial tubes, connect the windpipe to the lungs and play a crucial role in mucus production, protecting the respiratory organs and tissues. Pediatricians regularly encounter bronchitis in children as part of their practice, with respiratory infections being the primary reason for medical visits among children. Infants and young school-age children often experience bronchitis multiple times each year. (Irwin et al, 2006).

These occurrences tend to increase when children start daycare or nursery school, exacerbated by the mix of cold outdoor air and dry indoor heating, making the mucous lining more vulnerable to winter pathogens. The progression of bronchitis in children, even with bronchial obstruction complications, is significantly affected by genetic predisposition, especially with a family history of bronchial asthma and allergies. Exposure to tobacco smoke also poses a significant health hazard that should not be overlooked. (brodzinski H, Ruddy RM, 2009).

1.2. Aim of the study

The aim of the study was to estimate the prevalence, risk factors and causes of bronchitis among pediatric patients that preset in AL-Batoul Hospital for Obstetrics and Gynecology in Baquba/ Diyala/ Iraq.

1.3. Causes of Bronchitis

Acute bronchitis is primarily caused by viruses, accounting for approximately 90% of cases. The most common viral culprits include respiratory syncytial virus, parainfluenza virus, influenza virus, adenovirus, rhinovirus, metapneumovirus, and human bocavirus. Bacterial-induced acute bronchitis is rare, constituting only about 10% of cases. However, in around 15% of viral bronchitis cases, a secondary bacterial infection may occur. (Bundesvereinigung *et al,* 2011).

1.3.1. Respiratory syncytial virus (RSV) (Deis *et al,* 2010)

- It belongs to the Paramyxoviridae family.
- Two serological groups, A and B, are distinguished from each other.
- The virus's pathogenicity depends significantly on two glycoproteins on its surface: glycoprotein G facilitates docking with host cells, such as pneumocytes, while glycoprotein F is responsible for endocytosis into the cell.

1.3.2. Parainfluenzavirus (DGPI, 2009)

- It is categorized within the Paramyxoviridae family.
- Transmission of the virus occurs through droplet or smear infection.
- The typical incubation period ranges from 3 to 6 days.
- By the age of 2, nearly all children have experienced at least one parainfluenza infection.

• During infancy and early childhood, parainfluenza virus commonly leads to acute laryngotracheobronchitis, characterized by typical croup symptoms.

1.3.3. Influenzavirus (Ramanuja S, Kelkar PS, 2010)

- It is classified within the Orthomyxoviridae family, with three types: A, B, and C, although A and B are the most significant for human infections.
- The typical incubation period ranges from 1 to 4 days.

- Influenza shows a high incidence during the winter months.
- Epidemics often originate in nurseries, kindergartens, or schools.
- Children with respiratory tract illnesses, heart failure, or compromised immune systems are at particularly high risk for severe complications.

1.3.4. Adenovirus (Ramanuja S, Kelkar PS, 2010)

- It belongs to the Adenoviridae family.
- Transmission occurs through droplet or smear infection.
- The incubation period ranges from 2 to 10 days.
- Most diseases caused by adenovirus occur between the ages of 6 months and 5 years, typically presenting as a common cold.
- Adenovirus infections can lead to complex clinical outcomes, including severe obstruction, pneumonia, or persistent bronchial hyperreactivity lasting for months.

1.3.5. Rhinovirus (Deis JN, 2010)

- It is classified within the Picornaviridae family.
- Rhinovirus is primarily transmitted via aerosol.
- The typical incubation period ranges from 2 to 5 days.
- During the early years of life, the frequency of infection with the virus is approximately 1 to 2 times per year. While rhinovirus infections in adults commonly result in a common cold, infants and young children frequently develop obstructive bronchitis as a complication.

1.3.6. Metapneumovirus (Ramanuja S, Kelkar PS, 2010)

- It belongs to the Paramyxoviridae family.
- Transmission occurs through droplet and smear infections.
- The incubation period is typically 4 to 6 days.

- Around one quarter of infants are infected with the metapneumovirus during their first year of life, and by the time children start school, nearly everyone has experienced an infection with this widespread virus.Most prevalent symptoms are rhinitis and bronchitis.

1.3.7. Human bocavirus (Mejza *et al,* 2017)

• It is classified within the Parvoviridae family.

• The virus is primarily transmitted through droplet or smear infection.

• Clinically, acute respiratory symptoms are the most prominent. While chronic bronchitis can have various causes, the most significant factor is exposure to cigarette smoke, whether through active smoking or passive inhalation. Although bacterial and viral infections typically cause acute bronchitis, repeated exposure to infections can lead to chronic bronchitis.

• The main viruses responsible are Influenza types A and B.

• Common bacterial agents include Staphylococcus, Streptococcus, and Mycoplasma pneumonia.

Individuals with a history of respiratory conditions like asthma, cystic fibrosis, or bronchiectasis are more likely to develop chronic bronchitis. Those frequently exposed to environmental pollutants such as dust or airborne chemicals like ammonia and sulfur dioxide also face an increased risk of chronic bronchitis. Chronic gastroesophageal reflux, although less common, is a well-documented cause of chronic bronchitis. (Mejza *et al*, 2017).

1.4. Symptoms

A thorough medical history should be gathered, including information about exposure to harmful substances and smoking. Symptoms of bronchitis typically include the following:

1- **Cough:** The primary symptom of bronchitis is coughing. Initially, it tends to be dry and unproductive. As mucus production increases, the cough becomes more effective in clearing the airways. In some cases, severe coughing fits can lead to vomiting (Sethi S, Murphy TF, 2008).

2- **Sputum Production:** Bronchitis can result in the production of sputum, which can vary in color from clear to yellow, green, or even blood-tinged.

3- **Fever:** While not very common in bronchitis, fever can be present, especially when accompanied by a cough. It may suggest the possibility of influenza or pneumonia. (Sethi S, Murphy TF, 2008).

4- **Nausea, Vomiting, and Diarrhea:** Although rare, bronchitis may lead to symptoms like nausea, vomiting, and diarrhea.

5- **General Malaise and Chest Pain:** In severe cases, bronchitis can cause chest pain. Pain may be due to inflammation of the trachea or pleura. Pain can also result from the friction between inflamed visceral and parietal pleura (Knutson D, Braun C, 2002).

6- **Dyspnea, Tachypnea, and Cyanosis:** Bronchial obstruction due to mucus, bronchial mucosal edema, or bronchial muscle spasms can lead to rapid breathing (tachypnea) and shortness of breath (dyspnea). Signs of dyspnea may include flaring of the nostrils, use of accessory respiratory muscles, an upright posture, and wheezing or rales heard during auscultation (Ramanuja S, Kelkar PS, 2010).

7- **Sore Throat**

8- **Runny or Stuffy Nose**

9- Headache Muscle Aches

10- Extreme Fatigue

1.5. Gender and Age

In terms of gender-specific incidence, bronchitis affects males more than females. Acute (typically wheezy) bronchitis occurs most commonly in children younger than 2 years, with another peak seen in children aged 9-15 years. Chronic bronchitis affects people of all ages but is more prevalent in persons older than 45 years (Koehoorn *et al,* 2008).

1.6. Seasons

Bronchitis in children often encountered in the cold season because the winter-spring weather is very suitable for the development of disease-causing viruses. Besides, if the child has weak resistance or the body is infected with cold, the disease-causing factors are more susceptible to attack. That is why the peak of the disease often falls in the cold season (Heymann *et al*, 2004).

1.7. Diagnosis

Bronchitis may be suspected in patients with an acute respiratory infection with cough; yet, because many more serious diseases of the lower respiratory tract cause cough, bronchitis must be considered a diagnosis of exclusion.

Studies that may be helpful include the following (Knutson D, Braun C, 2002):

- ❖ Complete blood count (CBC) with differential
- ❖ Procalcitonin levels (to distinguish bacterial from nonbacterial infections)
- ❖ Sputum cytology (if the cough is persistent)
- ❖ Blood culture (if bacterial superinfection is suspected)
- ❖ Chest radiography (if the patient is elderly or physical findings suggest pneumonia)

❖ Bronchoscopy (to exclude foreign body aspiration, tuberculosis, tumors, and other chronic diseases)

❖ Influenza tests

❖ Spirometry

❖ Laryngoscopy (to exclude epiglottitis)

1.8.Complication

Complications are extremely rare and should prompt evaluation for tracheobronchial aspiration, anomalies of the respiratory tract, or immunodeficiency (Seaman AM, 2016). Complications may include the following:

• Bronchiectasis

• Bronchopneumonia

• Acute respiratory failure

1.9. Prevention

To help prevent the spread of viruses and bacteria that can lead to bronchitis and other illnesses. Additionally, it's essential to:

➢ Avoid close contact with individuals who are sick.

➢ Maintain good overall hygiene, including regular bathing and washing of clothes and bedding.

➢ Stay up-to-date on vaccinations, especially for flu and pneumonia.

➢ Maintain a healthy lifestyle with a balanced diet, regular exercise, and adequate sleep to support a strong immune system (Shield *et al,* 2008).

1.10.Treatment of bronchitis

By far the majority of cases of bronchitis stem from viral infections. This means that most cases of bronchitis are short-term and require nothing more than the treatment of symptoms to relieve discomfort. Intake of acetaminophen (Feverol, Panadol, Tylenol) or aspirin can alleviate patients with fever and muscle

aches. Drinking fluids is very important because fever causes the body to lose fluids faster. Lung secretions will be thinner and easier to clear when the patient is well hydrated. A cool mist vaporizer or humidifier can help decrease bronchial irritation. An over the counter cough suppressant may be helpful. Bronchodialator inhalers will help open airways and decrease wheezing (Mukherjee TK, 2009).

1.10.1. Effects of β2-agonists

Reviews concluded that β2-agonists produce only a modest short-term improvement; their use has no effect on hospitalization rate. There is insufficient evidence to support the use of epinephrine for bronchiolitis. The combination of ipratropium and a β2-agonist produced some improvement, but there is not enough evidence to support the uncritical use of anticholinergic therapy for wheezing infants (Mukherjee TK, 2009).

1.10.2. Effects of Corticosteroids

Systemic glucocorticoids have been widely prescribed for use in infants and young children with acute viral bronchiolitis but the actual benefit of this intervention requires clarification. Controversy remains regarding the exact efficacy of systemic corticosteroids for acute bronchiolitis (Patel H, 2008).

1.10.3. Effects of Antibiotics

It is unclear as to whether antibiotics are beneficial in the treatment of bronchiolitis and acute bronchitis in infants and young children. These conditions are usually caused by viruses. However, antibiotics are prescribed only if there is a likelihood of a secondary bacterial infection (Friis B, 1984). However, since it is difficult to distinguish between viral and bacterial infection, antibiotic therapy may be a good practice particularly in vulnerable groups such as young children or in patients showing sign of deterioration (Welsh Medicine Resources Center, 1994; Becker L, 1998). Antibiotic therapy results in a shorter duration of cough and decreased likelihood of persisting cough (Smucny JJ, 1998; Smucny JJ, 2000).

Bent S, 1999 also showed that antibiotic therapy decreased the duration of cough by 12 hours.

((Chapter Two))

Materials and Methods

2.1. Study design

This is a prospective randomized study to evaluate the prevalence and the possible risk factors that contribute to with bronchitis among pediatrics. The study was evaluated between October 2023 and December 2023 in AL-Batoul Hospital for Obstetrics and Gynecology in Baquba/ Diyala/ Iraq.

2.1.1. Patients selection

Data from (84) child (63) male and (21) female who attempted AL-Batoul hospital suffering from bronchitis were selected for the study.

Detailed socio-demographical information's, medical history, symptoms and possible risk factors together with other information were collected. Information about smoking habits and alcohol habits family member were obtained to evaluated the health of the patient. All these information were obtained using special designed data sheet (appendix 1).

2.2 Study groups

The eligible patients and subjects were allocated into two main groups:

Group 1:include (67) pediatric patient who were diagnosed having bronchitis under 6 years old.

Group 2: include (17) pediatric patient who were diagnosed having bronchitis between age of six to twelve years.

2.3 Statistical analysis

Analysis of data was carried out using (spss program; Version 24). Analysis of data were done using Fisher's exact test of independent to assess if there is an association between two variable. If the p value was <0.05 the result is significant and if the p value was > 0.05 the result is not significant.

((Chapter Three))

Results

3.1. Socio-demographic characteristics for the pediatric patients with bronchitis

The current study was done to evaluate the prevalence, associated cause and the risk factors of bronchitis among Iraqi children. Table (3-1), show the distribution of socio-demographic characteristics among the study population. (84) child was involved in the study, most of them were male 63 (75%) and 21 (25) female and most of them were under 6 years old 67 (80%) and only 17 (20%) were between 6-12 year old. It was found that most of the study population parents had primary level of education 28 (33%), 15 (18%) had secondary level of education, 20 (24%) were college educated, 15 (18%) were uneducated and only 6 (7%) had post-graduation education. For the economic state of the study population 46 (55%) were working and had a job and 35 (42%) were un-employed and just 3(3%) were retired. According to the collected data most of the study population were living in the urban places 54 (64%) and 30 (36%) were living in the rural places.

Table (3-1): Socio-demographic parameters for pediatric patients with bronchitis

Characteristics	frequency	Percentage %
Gender		
Male	63	75%
Female	21	25%
Total	84	100%
Age		
less than 6 yrs.	67	80%
6-12 yrs.	17	20%
Total	84	100%
level of parents education		
Non-educated	15	18%
Primary	28	33%
Secondary	15	18%
College	20	24%
Post-graduated	6	7%
Total	84	100%

Residence status		
Rural	30	36%
Urban	54	64%
Total	84	100%
Socio-economic state		
Un-employed	35	42%
Retired	3	3%
Work	46	55%
Total	84	100%

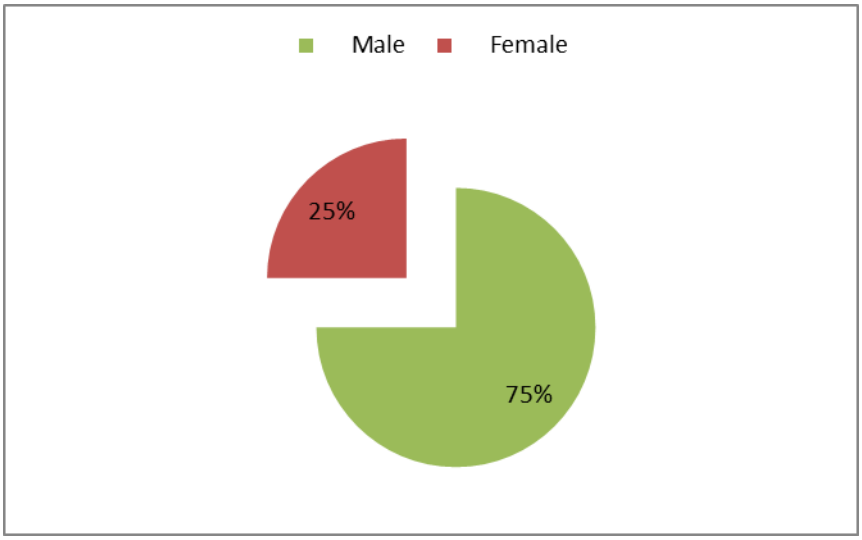

Figure (3-1): Percentage of male and female of the study

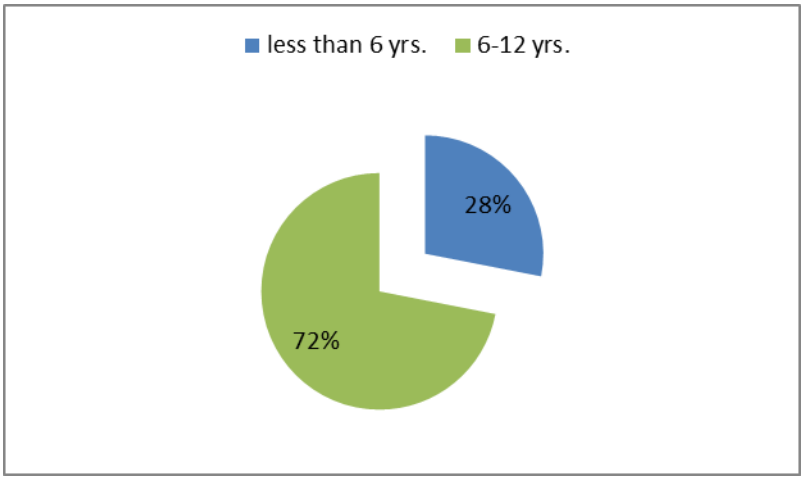

Figure (3-2): Distribution of the age group of the study

3.2. Distribution of bronchitis in pediatric patients according to the related risk factors

Table (3-2), show the distribution of bronchitis according to the related risk factors to see which is the most risk factor that associated with bronchitis and the study population was divided into two groups according to their age, family history considers on of the most common risk factor and it show that 34 (51%) out of 67 children under 6-year-old had a sibling who had bronchitis, 7 (10%) had father who had bronchitis and 6(9%) had mother who had bronchitis, also 17 (25%) had no history of bronchitis and 7 (40%) out of 17 child between 6-12 year old had a sibling with bronchitis . According to the statistical analysis p value was 0.120 which is>0.05 so these results is not significant. Smoking is one of the most associated risk factors of bronchitis and having a family member who smoke can help with the development of bronchitis in the child and the study show that 48 (72%) out of 67 of the child under 6 years had a family member who smoke and 12 (71%) out of 17 children between 6-12-year-old had a family member who smoke and only 5 (29%) out of child between 6-12-year-old doesn't have any family member who smoke. According to the statistical analysis these result is not significant as the p value >0.05. family history of asthma also considers one of the associated risk factors and it was found that 12 (18%) out of 67 children under 6-year-old and 7 (41%) out of children between 6-12-year-old had a history of asthma and the statistical analysis of these data show it is not significant because the p value >0.05. The collected data show that 53(79%) out of children under 6-year-old and 15 (88%) out of children between 6- 12-year-old exposure to second hand smoke which help in developing bronchitis in children, these result not significant as the p value > 0.05.

Table (3-2): Distribution of bronchitis in pediatric patients according to the related risk factors

Characteristics	**less than 6 yrs**		**6-12 yrs**		**Statistical analysis**
	frequency	**%**	**frequency**	**%**	
Family history					P value
Father	7	10%	3	18%	0.120
Mother	6	9%	3	18%	
Both parents	3	5%	2	12%	
Sibling	34	51%	7	40%	
None	17	25%	2	12%	
Total	67		17		
Smoking family member					1.000
Yes	48	72%	12	71%	
No	19	28%	5	29%	
Total	67	100%	17	100%	
Alcohol family member					0.2024
Yes	0	0%	1	6%	
No	67	100%	16	94%	
Total	67	100%	17	100%	
History of asthma					0.0542
Yes	12	18%	7	41%	
No	55	82%	10	59%	
Total	67	100%	17	100%	
History of allergy					0.4442
Yes	11	16%	1	6%	
No	56	84%	16	94%	
Total	67	100%	17	100%	
Chronic sinus issue					1.000
Yes	2	3%	0	0%	
No	65	97%	17	100%	
Total	67	100%	17	100%	
Exposure to outer pollution					0.7015
Yes	9	13%	3	18%	
No	58	87%	14	82%	
Total	67	100%	17	100%	

Living in crowded environment					0.4022
Yes	23	34%	8	47%	
No	44	66%	9	53%	
Total	67	100%	17	100%	
Exposure to secondhand smoke					0.5064
Yes	53	79%	15	88%	
No	14	21%	2	12%	
Total	67	100%	17	100%	

3.3. Distribution of bronchitis symptoms and season between study groups

Table (3-3) show the distribution of bronchitis symptoms between the two study groups and also the most common season of developing bronchitis and it was found that most common season for developing bronchitis is winter 55 (83%) out of children under 6-year-old and 14 (82%) out of children between 6-12-year-old had it in winter and 9 (13%) out of 67 children under 6-year-old and 1 (6%) out of 17 children between 6-12-year-old had it in autumn. These results were not significant as the p value > 0.05. Most common symptoms of bronchitis was cough as 55 (96%) of children under 6 years and 16 (94%) out of 17 children between 6-12 years old had it and these result was not significant as the p value > 0.05. Sore throat was the second most common symptom as 31 (46%) had it and 36 (54%) don't have it out of 67 children under 6 years old while 9 (53%) of children between 6-12 years old had sore throat and 8 (47%) don't, the statistical results of these data was not significant as the p value > 0.05. 20 (30%) out of 67 children under 6 years old had wheezing and 47 (70%) don't while 3 (18%) out of 17 children between 6-12 years old had wheezing and 14 (82%) don't. these results were not significant as the p value > 0.05. 10 (15%) of children who are between 6-12 years old had headache and 9(53%) out of 17 children between 6-12 year had headache and 8 (47%) don't while the children under 6 years old 57 (85%)

don’t suffer from headache. The statistical results of these data was significant as the p value < 0.05.

Table (3-3): distribution of bronchitis symptoms and season between study groups

Characteristics	**Less than 6 yrs.**		**6-12 yrs.**		**Statistical analysis**
Seasons	**Frequency**	**%**	**Frequency**	**%**	**P value**
Winter	55	83%	14	82%	0.1253
Spring	1	1%	1	6%	
Summer	2	3%	1	6%	
Autumn	9	13%	1	6%	
Total	67	100%	17	100%	
Cough					
Yes	55	96%	16	94%	0.5486
No	2	4%	1	6%	
Total	67	100%	17	100%	
Sore throat					0.7866
Yes	31	46%	9	53%	
No	36	54%	8	47%	
Total	67	100%	17	100%	
Body ache					0.2980
Yes	11	16%	5	29%	
No	56	84%	12	71%	

Total	67	100%	17	100%	
Fatigue					0.1820
Yes	12	18%	6	35%	
No	55	82%	11	65%	
Total	67	100%	17	100%	
Wheezing					0.3778
Yes	20	30%	3	18%	
No	47	70%	14	82%	
Total	67	100%	17	100%	
Headache					0.0021
Yes	10	15%	9	53%	
No	57	85%	8	47%	
Total	67	100%	17	100%	
Other symptoms					0.4006
Yes	24	36%	4	24%	
No	43	64%	13	46%	
Total	67	100%	17	100%	

3.4. Distribution of bronchitis in pediatric according to causes and diagnosis test

In order to evaluate the cause of bronchitis table (3-4), show that the most common cause was viral infection in the two age group of the study population, 43 (65%) out of 67 children under 6 years old and 7 (41%) out of 17 children between 6-12 years old had viral infection that cause them bronchitis and 21 (31%) of children under 6 year had bacterial infection while 9 (53%) of children between 6-12 year had bacterial infection also, the statistical data show that these

results are not significant as the p value > 0.05. many tests are done to diagnosis of bronchitis chest x-ray is one of the most common tests, 54(81%) out of 67 children under 6 years old and 15 (88%) out of 17 children between 6-12 years old was diagnosed with bronchitis by chest x-ray test, these results are not significant as the p vale > 0.05. 53 (79%) out of 67 children under 6 years old and 17 (100%) out of 17 children between 6-12 years old had a blood culture test and these results were not significant as the p value > 0.05. 54 (77%) out of 67 children under 6 years old and 11 (65%) out of 17 children between 6-12 years old had a complete blood count test, and these results were not significant as the p value was > 0.05.

Table (3-4): Distribution of bronchitis in pediatric according to causes and diagnosis test

Characteristics	**less than 6 yrs.**		**6-12 yrs.**		**Statistical analysis**
Causes	**Frequency**	**%**	**Frequency**	**%**	**P value**
Viral bronchitis	43	65%	7	41%	0.1365
Bacterial bronchitis	21	31%	9	53%	
Chronic bronchitis	3	4%	1	6%	
Total	67	100%	17	100%	
Diagnosis test					
Chest x-ray					0.7247
Yes	54	81%	15	88%	
No	13	19%	2	12%	
Total	67	100%	17	100%	
Blood culture					0.0624
Yes	53	79%	17	100%	
No	14	21%	0	0%	
Total	67	100%	17	100%	
Complete blood count					0.1974
Yes	54	77%	11	65%	
No	13	23%	6	35%	
Total	67	100%	17	100%	
Urea and electrolyte					0.5078

analysis					
Yes	13	23%	5	29%	
No	54	77%	12	71%	
Total	67	100%	17	100%	
Urine culture					0.7395
Yes	13	23%	4	24%	
No	54	77%	13	76%	
Total	67	100%	17	100%	
Other diagnosis criteria					1.0000
Yes	11	16%	2	12%	
No	56	84%	15	88%	
Total	67	100%	7	100%	

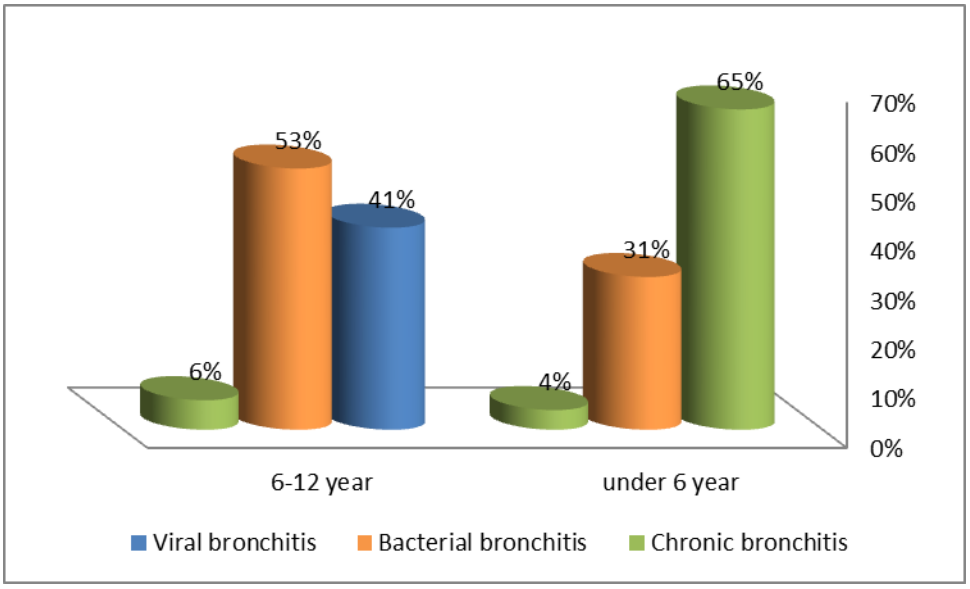

Figure (3-3): Cause of bronchitis in both age group

3.5. Distribution of bronchitis treatment in different study groups

In order to see which is the most common treatment been used in the treatment of bronchitis and according to table (3-5), bronchodilator was given to 52 (78%) out of 67 children under 6 years old and 17 (100%) out of 17 children

between 6-12 years old, these results was significant as the p value <0.05. Hypertonic saline was also given to 50 (75%) of children under 6 years old and 15 (88%) of children between 6-12 years old out of 67 children under 6 years old and 17 children between 6-12 years old. Nebulizer epinephrine was given to only 13 out of 67 children under 6 years old and 0 out of 17 children between 6-12 years old and these was non-significant results as the p value > 0.05. corticosteroid was given to 32 (48%) out of 67 children under 6 years old and 13 (76%) children between 6-12 years old and it was a non-significant results as the p value > 0.05. antiviral was given to only 4(6%) out of 67children under 6 years old and no child between 6-12 years old had antiviral treatment. Montilukast was given to only 4 (6%) out of 67 under 6 years old and 5 (29%) out of 17 between 6-12 years old and it was significant results as the p value < 0.05. Antibiotics was mostly given treatment as it was given to 64 (96%) child out of 67 under 6 years old and 17 (100%) out of 17 children between 6-12 years old also these results were not significant as the p value> 0.05.

Table (3-5): Distribution of bronchitis treatment in different study groups

Characteristics	**less than 6 yrs.**		**6-12 yrs.**		**Statistical analysis**
Treatment	**Frequency**	**%**	**frequency**	**%**	**P value**
Bronchodilator					
Yes	52	78%	17	100%	0.0335
No	15	22%	0	0%	
Total	67	100%	7	100%	
Hypertonic saline					
Yes	50	75%	15	88%	0.3362
No	17	25%	2	12%	
Total	67	100%	17	100%	
Nebulizer epinephrine					

Yes	13	19%	0	0%	0.0612
No	54	81%	17	100%	
Total	67	100%	17	100%	
Corticosteroid					
Yes	32	48%	13	76%	0.0550
No	35	52%	4	24%	
Total	67	100%	17	100%	
Antiviral					
Yes	4	6%	0	0%	0.000
No	63	94%	17	100%	
Total	67	100%	17	100%	
Montilukast					
Yes	4	6%	5	29%	0.000
No	63	94%	12	71%	
Total	67	100%	17	100%	
Antibiotics					
Yes	64	96%	17	100%	1.000
No	3	4%	0	0%	
Total	67	100%	17	100%	
Additional treatment					
Yes	18	27%	1	6%	0.1024
No	49	73%	16	94%	
Total	67	100%	17	100%	

((Chapter Four))

Discussion, Conclusion and Recommendation

4.1 Socio-demographic characteristics for the pediatric patients with bronchitis

The present study found that male percentage 75% is more than female 25% preponderance information of pediatric bronchitis this is agreed with Nguyen SN, study which showed that pediatric bronchitis occurs with a male to female.

The same study also agree with the prevalence of age of the bronchitis and show that it occur more in pediatric under 6 years old.

The present study results found that the residence place has an important impact as the infection in urban places was (64%) which is higher than rural places which was (36%) that because the urban places is more crowded and has higher pollution percentage and more smoker people which consider the most important causes for developing bronchitis. This agree with a study done by Atay Ö which showed that children who live in urban places were more susceptible for developing bronchitis than children who live in rural places.

4.2 Distribution of bronchitis in pediatric patients according to the related risk factors

It has been found that family history has an important impact on bronchitis in both groups. As it considered one of the most important risk factor for developing the disease, according to our results it was found that most of pediatric with bronchitis have a sibling who diagnosed with the same disease also it was seen that one of the parents was suffering from bronchitis in both age group, this result agree with a study done by McConnochie KM, which showed there is a related relationship between bronchitis in children and family history.

Smoking considered the most important risk factor for developing bronchitis, so having a family member who smoke make the child more susceptible for developing bronchitis and that was approved by our results as most of the children in both age group had a family member who smoke, this agree with a study done

by Atay Ö which show that children who had a smoker family member developed bronchitis more.

History of asthma and allergy also is one of the risk factors for developing bronchitis, our study population was small so because of that it was seen that not all of the children had history of asthma and allergy.

Exposure to second hand smoke and being in crowded environment maybe one of the related risk factors for developing bronchitis and that was approved by our study and agree with a study done by Atay Ö which showed that children who live in crowded environment and exposure to pollution air had more chance in developing bronchitis.

4.3 Distribution of bronchitis symptoms and season between study groups

Winter considered the best season for developing bronchitis due to decrease in temperature and increase humidity as they are the best environment for virus to grow and that was approved by our study as the winter was the most season that the child developed bronchitis in it, this is agree with the study done by Fauroux B which showed that winter was the best season for developing bronchitis.

Symptoms of bronchitis is similar in all children the child developed cough, wheezing, fever, fatigue, headache muscle ache, sore throat and vomiting and diarrhea. These are the most common symptoms of bronchitis and it may slightly different from child to other but according to our study cough was the most seen symptoms followed by sore throat and wheezing, also (24) children under 6 year old and (4) child between 6-12 year old suffered from other symptoms which was diarrhea and vomiting. These result agree with a study done by Atay Ö which proved that coughing was the most frequent complaint among all agents and was

present in all patients. The second most common symptom was restlessness (95%) and the third was wheezing (89.1%).

4.4 Distribution of bronchitis in pediatric according to causes and diagnosis test

Virus infections are the leading cause of bronchiolitis in children worldwide and that what was approved by our study and agree with a study done by Nguyen SN and may other studies that had been done in this topic, also a study done by A.Nicolai which proved that RSV is well recognized as the most common virus in acute bronchiolitis in infants hospitalized. Staphylococcus, Streptococcus, and Mycoplasma pneumonia are the dominant badterial agent that cause bronchitis in children and in our study there was (21) child under 6 year old and (9) between 6-12 year had bacterial bronchitis.

To help the doctors in diagnosing of the disease a complete medical history need to be taken and several tests need to be done, chest x-ray is the most common and useful test and that was seen in our results, as it give a complete image for the lung and will help the doctor in using antibiotics for the patient. Complete blood count and blood culture also help in investigating of the bronchitis, urine culture also may help in the investigation of the disease, these results agree with a study done by Christakis DA which said that 72% of the total study patient get chest x-ray and the other had blood culture test and urine culture test.

4.5 Distribution of bronchitis treatment in different study groups

Bronchitis in children need to be done immediately to prevent the spread of the infection, so it was seem that almost all the patients in both age group received bronchodilator because they help in dilates the bronchi and bronchioles, decreasing resistance in the respiratory airway and increasing airflow to the lungs.

It is unclear as to whether antibiotics are beneficial in the treatment of bronchiolitis and acute bronchitis in infants and young children. These conditions are usually caused by viruses. However, antibiotics are prescribed only if there is a likelihood of a secondary bacterial infection so antibiotic treatment was started if the patient had a high fever, showed consolidation in their chest x-ray or had high acute phase reactants.

Corticosteroids were started if the patient had a severe episode or did not respond to the bronchodilator. Steroids can help reduce inflammation in the bronchial tubes, making it easier to breathe and reducing symptoms such as coughing and wheezing.

The value of antiviral agents in acute, transient infections seems limited. To be effective, they have to be given early, ideally within 1 or 2 days of diseases onset and that what limited its use in treating bronchitis.

The results of our study agree with a study done by Atay Ö which show that all the patients were given bronchodilators, 86 (85.1%) were given antibiotics, and 52 (51.5%) were given systemic steroid treatment, also a study done by King VJ agree with these results.

4.6 Conclusion

1- Bronchitis is one of the most serious disease of pediatric and cause hospitalization of the child so a complete history and accurate investigation is need to confirm the diagnosis of the disease and starting the right treatment to help the patient get better.

2- Parents need to be educated about the disease and it risk factors and causes in order to avoid them as much as possible to prevent the child from getting the disease.

3- The parents should try to get their kids away from crowded environment and smoker people as much as possible

4.7 Recommendation

Bigger and longtime studies need to be done in this topic in order to increases the awareness about the disease and doing a workshops or advertisement by health care specials to increase the knowledge about bronchitis and save children lives.