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Review Article

**ROLES OF FAMILY PHYSICIANS IN THE MANAGEMENT OF
ACUTE BRONCHITIS IN PRIMARY CARE**

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Abstract:

Acute bronchitis is one of the commonest medical problems managed by health services, and one of the important clinical questions is how to diagnose it in primary care, and differentiate from other disease and careful step of management to resolve disease. In this review we discuss management strategies by family doctor. Electronic databases (PubMed/ Embase) were searched up to NOVEMBER, 2018, for relevant literature in the management of Acute bronchitis in primary care by family doctors. Acute bronchitis is a widespread disease identified by fever and coughing that is usually wheezy in nature which may or may not be productive. The condition occurs when the bronchi end up being inflamed because of either viral or microbial infection. Signs normally last for 2 weeks, however the connected cough can last for as much as 8 weeks. Acute bronchitis needs to be separated from acute inflammation of the tiny airways- asthma or bronchiolitis- which normally provides as modern coughing accompanied by wheezing, tachypnea, respiratory distress, and hypoxemia. It ought to also be distinguished from bronchiectasis, a unique phenomenon associated with irreversible dilatation of bronchi and chronic cough. The diagnosis of acute bronchitis is developed in a patient that has the unexpected beginning of coughing, with or without sputum expectoration, and without evidence of pneumonia, the common cold, acute asthma, or an acute exacerbation of chronic bronchitis.

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INTRODUCTION:

Acute bronchitis is a clinical term meaning a self-limited inflammation of the large air passages of the lung that is defined by cough without pneumonia. The ailment influences approximately 5% of adults annually, with a greater incidence observed during the wintertime and fall than in the summer and spring [1].

Viruses are usually taken into consideration the root cause of acute bronchitis but have been isolated in a minority of patients [1], [2]. Those separated in acute bronchitis (from one of the most to the least usual in large series) include influenza A and B infections, parainfluenza infection, respiratory syncytial infection, coronavirus, adenovirus, and rhinovirus. Human metapneumovirus has been recognized as a causative agent [1]. A recent French research study involving grownups that had been vaccinated against influenza revealed a viral cause in 37% of 164 situations of acute bronchitis, of which 21% were rhinovirus [2]. Thus, the yield of specific pathogens differs according to several factors, including the existence or absence of an epidemic, the season of the year, and the influenza vaccination standing of the populace.

Bacterial species commonly implicated in community-acquired pneumonias are separated from the sputum in a minority of patients with acute bronchitis [1]. Nevertheless, the function of these species in the disease or its attendant symptoms continues to be vague, due to the fact that bronchial biopsies have not shown bacterial invasion. In many cases, atypical microorganisms are important causes, including *Bordetella pertussis*, *Chlamydia pneumoniae*, and *Mycoplasma pneumoniae* [1]. Some information has actually suggested that *B. pertussis* may underlie 13 to 32% of circumstances of coughing long lasting 6 days or longer, although in a recent possible study, *B. pertussis* consisted of only 1% of cases of acute respiratory disease [3].

Acute bronchitis is one of the commonest medical problems managed by health services, and one of the important clinical questions is how to diagnose it in primary care, and differentiate from other disease and careful step of management to resolve disease. In this review we discuss management strategies by family doctor.

METHODOLOGY:

Electronic databases (PubMed/ Embase) were

searched up to NOVEMBER, 2018, for relevant literature in the management of Acute bronchitis in primary care by family doctors, we retracted most evidence based review, trails, and randomized control studies discussing the Acute bronchitis in primary care, furthermore we searched references column of each identified study for more relevant articles that did not show up by previous search method. English language restriction for published studies was applied.

DISCUSSION:

- **PATHOBIOLOGY**

Acute bronchitis is thought to mirror an inflammatory reaction to infections of the epithelium of the bronchi. Epithelial-cell desquamation and denuding of the airway to the level of the basement membrane layer in association with the existence of a lymphocytic cellular infiltrate have actually been demonstrated after influenza A tracheobronchitis; microscopical examination has revealed enlarging of the bronchial and tracheal mucosa corresponding to the inflamed areas [4]. Such pathological findings are consistent with records of proximal reduced airway inflammation confined to the bronchi, as identified by positron-emission tomography with 18F-fluorodeoxyglucose as a tracer, in the setting of acute bronchitis [4].

Nonetheless, there are wide variations in the physiological distribution of numerous microorganisms that create acute respiratory disease. In a study including volunteers subjected to rhinovirus infections, for example, virus was identified in specimens of caused sputum obtained from all the subjects, in approximately one third of bronchial biopsy samplings, in almost a quarter of bronchoalveolar lavage specimens, and in greater than a third of bronchial brushing samplings [5]. Such data indicating viral infection of the lower airways may assist to explain the relationship observed in between rhinovirus infection (and various other assumed top breathing viral infections) and worsening of asthma [6]. Hence, although its name suggests only large-airway disease, acute respiratory disease might be accompanied by an array of signs and symptoms, depending on the degree of viral participation of the large and small respiratory tracts.

- **DIAGNOSIS**

MEDICAL HISTORY:

Coughing is the primary and specifying sign of acute

bronchitis. The primary diagnostic factor to consider in patients with presumed acute bronchitis is eliminating much more major causes of coughing, such as asthma, exacerbation of chronic obstructive pulmonary disease, heart failure, or pneumonia. The diagnoses that have one of the most overlap with acute respiratory disease are top respiratory system tract infections and pneumonia. Whereas acute respiratory disease and the common cold are self-limited health problems that do not require antibiotic treatment, the standard treatment for pneumonia is antibiotics.

Besides coughing, various other symptoms and signs of acute respiratory disease consist of sputum generation, dyspnea, nasal congestion, headache, and fever [7]. The initial couple of days of an acute bronchitis infection may be indistinguishable from the common cold. Patients may have substernal or upper body wall surface pain when coughing. Fever is not a normal seeking after the initial few days, and presence of a fever greater than 100 ° F (37.8 ° C) should prompt factor to consider of influenza or pneumonia. Generation of sputum, also purulent, prevails and does not correlate with microbial infection [8].

Since the cough connected with bronchitis is so bothersome and slow to resolve, patients usually look for therapy. Patients and clinicians may take too lightly the time needed to fully recover from acute bronchitis [9]. The duration of acute bronchitis - relevant cough is usually a couple of weeks, with a pooled estimate of 18 days in one organized review [9]. This corresponds to outcomes of a prospective test, which found that patients who had a cough for at least 5 days had an average of 18 days of coughing [9].

PHYSICAL EXAMINATION:

On physical checkup, patients with acute bronchitis might be mildly ill-appearing, and high temperature exists in concerning one-third of patients [10]. Lung auscultation might expose wheezes, along with rhonchi that typically improve with coughing. It is essential to eliminate pneumonia. High fever; modest to serious ill-appearance; hypoxia; and indications of lung consolidation, such as decreased breath sounds, bronchial breath sounds, crackles, egophony, and boosted tactile fremitus, are worrying for pneumonia. Pneumonia is not likely in nonfrail older grownups

that have typical essential indications and regular lung exam findings [11].

DIAGNOSTIC TESTING:

Clinical screening is typically not shown in the analysis of acute bronchitis. Leukocytosis exists in about 20% of patients; significant leukocytosis is more probable with a microbial infection than with bronchitis [12]. Although fast testing is available for some respiratory system microorganisms, it is typically not essential in the regular ambulatory care patient [12]. Testing for influenza and pertussis may be thought about when the suspicion is high and therapy would affect the program of the illness.

Biomarkers may help in recognizing patients who could take advantage of anti-biotics. Studies using C-reactive protein degrees to lead antibiotic usage in patients with respiratory system infections are inconclusive, although an elevated C-reactive protein level was connected with an increased probability of pneumonia in a large health care trial [13]. A clinical decision regulation for pneumonia was created and prospectively confirmed by Swiss scientists, who found that pneumonia could be dismissed in patients with a C-reactive healthy protein degree of less than 50 mcg per mL and no dyspnea or daily high temperature [14]. Procalcitonin screening may work in the distinction of pneumonia and acute bronchitis, however it is not commonly available in medical settings. A big primary care trial of patients with lower respiratory tract infections found that procalcitonin testing added no benefit to a design that included signs, symptoms, and C-reactive healthy protein levels [13].

Indication for chest Radiography

In patients with symptoms of acute bronchitis, imaging is mostly made use of to eliminate pneumonia. Evidence-based guidelines from the American College of Chest Physicians state that imaging is not required in patients with acute respiratory disease symptoms who have normal crucial indications and normal lung test findings [15]. Patients with pneumonia typically have tachypnea, tachycardia, or dyspnea [13]. An exception to this guideline is patients older than 75 years, that might offer with even more subtle signs of pneumonia and are much less most likely to have fever or tachycardia [15].

Table 1. Indications for Chest Radiography in Adult Patients with Symptoms of Acute Bronchitis [15].

Dyspnea, bloody sputum, or rusty sputum color
Pulse > 100 beats per minute
Respiratory rate > 24 breaths per minute
Oral body temperature > 100°F (37.8°C)
Focal consolidation, egophony, or fremitus on chest examination

- TREATMENT**

Antibiotics

Although many authorities have actually argued that antibiotics have no function in the treatment of acute respiratory disease, these agents continue to be the primary treatment provided to patients. Medical care physicians in the United States have actually dealt with acute respiratory disease with a wide range of antibiotics, despite the fact that scant proof exists that prescription antibiotics offer any type of substantial

benefit over placebo (table 2) [16]. Placebo-controlled research studies using doxycycline, erythromycin and trimethoprim-sulfamethoxazole [HYPERLINK](https://www.aafp.org/afp/1998/0315/p1270.html)

"<https://www.aafp.org/afp/1998/0315/p1270.html>" have fallen short to reveal consistent significant advantage for antibiotic therapy in acute bronchitis [17]. Also, when patients with *M. pneumoniae* infection can be identified utilizing a quick recognition system, therapy with erythromycin has provided only minimal advantage [17].

Table 2. Trials of Antibiotics in the Treatment of Acute Bronchitis [16].

<i>STUDY</i>	<i>ANTIBIOTIC</i>	<i>SAMPLE SIZE</i>	<i>RESULTS</i>
Stott and West (1976)	Doxycycline	212	No benefit on any outcome
Williamson (1984)	Doxycycline	74	No benefit on any outcome
Brickfield, et al. (1986)	Erythromycin	52	No benefit on any outcome
Dunlay, et al. (1987)	Erythromycin	63	Reduced use of cough medicines and fewer abnormal lung examinations on follow-up in treated patients
Franks and Gleiner (1984)	Trimethoprim with sulfamethoxazole	67	Fewer days of coughing, fewer days off work and reduced use of decongestants in treated patients

<i>STUDY</i>	<i>ANTIBIOTIC</i>	<i>SAMPLE SIZE</i>	<i>RESULTS</i>
King, et al. (1996)	Erythromycin	91	Earlier return to work in treated patients

Regularly, antibiotics are recommended mostly to meet patient assumptions. While medical professionals might comprehend that antibiotics are ineffective for acute respiratory disease, they suggest them anyway, fearing that failing to do so will certainly leave patients less satisfied. Nonetheless, one study found that patient fulfillment with care did not depend on the receipt of an antibiotic prescription [18]. As long as physicians explained the rationale for treatment, patients that expected prescription antibiotics and did not obtain them were just as satisfied as those who were provided anti-biotics.

Another explanation for the frequent prescription of antibiotics is the lack of difference in between acute and chronic bronchitis. Chronic bronchitis is characterized by consistent and irreversible inflammatory changes in the bronchial tree, with these changes resulting in chronic cough, daily sputum generation and shortness of breath. Patients with underlying chronic bronchitis might occasionally become infected with a variety of organisms that create modifications in their common breathing signs and symptoms. In such instances, the evidence concerning the performance of antibiotic treatment varies.

Although some studies reveal that antibiotic treatment is valuable in patients with exacerbations of chronic respiratory disease, various other research studies are much less persuading [19]. Antibiotic efficiency trials that do not differentiate between acute respiratory disease and exacerbations of chronic respiratory disease include in the

complication. Mistaken beliefs about the function of bacteria in acute respiratory disease and the prevalent technique of treating this ailment with anti-biotics may originate from research studies that consisted of patients with chronic respiratory disease who were mislabeled as having acute respiratory disease [20].

Bronchodilators

The pulmonary function findings in moderate asthma and acute bronchitis are comparable. Therefore, it has been hypothesized that bronchodilating agents might provide symptomatic alleviation to patients with bronchitis.

Three researches have actually reviewed the efficiency of bronchodilators in the therapy of acute respiratory disease (table 3) [21-23]. These studies all demonstrated considerable relief of signs and symptoms in patients with bronchitis that received oral albuterol (4 mg four times daily), inhaled albuterol (2 puffs four times daily) or fenoterol (not offered in the United States). Compared with patients who obtained placebo, those who were treated with albuterol were more probable to have quit coughing within a week of the initiation of therapy [21-23]. The patients who were treated with inhaled albuterol likewise returned to work quicker. The results of incorporating albuterol with an antibiotic have also been assessed. In among these studies, no benefit was shown from adding erythromycin to the therapy program of patients who were already obtaining albuterol.

Table 3. Studies of Bronchodilators for Acute Bronchitis or Cough [21-24]

<i>STUDY</i>	<i>STUDY POPULATION</i>	<i>STUDY SIZE</i>	<i>MEDICATION USED</i>	<i>DURATION OF THERAPY</i>	<i>MAIN DIFFERENCE NOTED WITH DRUG THERAPY</i>
Melbye, et al. (1991)[21]	Adults with bronchitis	73	Fenoterol aerosol vs. placebo	Seven days	Improvement in general symptom score

<i>STUDY</i>	<i>STUDY POPULATION</i>	<i>STUDY SIZE</i>	<i>MEDICATION USED</i>	<i>DURATION OF THERAPY</i>	<i>MAIN DIFFERENCE NOTED WITH DRUG THERAPY</i>
					Faster resolution of abnormal lung findings
					Improvement in the forced expiratory volume in one second (FEV ₁)
Hueston (1991)[22]	Adults with bronchitis	34	Oral albuterol vs. erythromycin	Seven days	Reduction in the percentage of patients who were coughing after one week
					Trend toward improved well-being
Hueston (1994)[23]	Adults with bronchitis	46	Albuterol aerosol vs. placebo (with and without an antibiotic)	Seven days	Reduction in the percentage of patients who were coughing after one week
					More patients returned to work by day 4 of treatment
Littenberg, et al. (1996)[24]	Acute nonspecific cough	104	Albuterol aerosol vs. placebo	Seven days	No benefits

Another research study in patients with undifferentiated cough discovered no beneficial result from albuterol therapy [24]. The investigators that conducted this research did not try to choose patients with efficient cough and/or obstructive symptoms. Due to the numerous sources of cough, the study populace probably consisted of patients with acute respiratory disease along with several other conditions, including sinus problems, top respiratory system infection and asthma. The results of this study

show that bronchodilators are most likely to be efficient just when bronchial inflammatory modifications exist.

Till much better clinical data are offered, doctors have to depend on an accurate history and the scientific image of efficient cough and wheezing to direct them in the use of bronchodilator treatment.

Other Therapy

The few randomized, placebo-controlled trials that have actually checked out the result of β_2 -agonists provided orally or by aerosol for cough associated with acute bronchitis have actually included several of patients and have actually had combined outcomes [21-23]. In these studies, amongst patients without preexisting lung illness, regular coughing scores and the possibility of persistent coughing after 7 days did not differ significantly between the dynamic treatment and placebo groups. Nonetheless, in one trial, a subgroup of patients with evidence of air movement restriction had considerably reduced scores for symptoms on day 2 after treatment with β_2 -agonists [25]. A current Cochrane Review of five tests involving 418 adults showed that even among patients with air flow blockage, the prospective benefit of β_2 -agonists is not well sustained and need to be balanced against the damaging impacts of treatment [20]. In practice, a short test (7 days) of inhaled or oral corticosteroids might be reasonable for troublesome coughing (i.e., cough continuing for more than 20 days), however there are no medical test data to support this method. Information from medical tests are likewise not offered to support the use of mucolytic or antitussive agents.

- **Possible Complication of Bronchitis: Adult-Onset Asthma**

Serologic proof of previous infection with *C. pneumoniae* has actually been identified in some adults with new-onset asthma [17]. Consequently, significant focus has been focused on whether adult-onset asthma is often come before by a chlamydial respiratory system infection. Both *Chlamydia trachomatis* and *C. pneumoniae* have actually been cultured from the sputum of kids with asthma. However, no prevalence researches have actually analyzed the frequency with which patients that have respiratory system ailments such as bronchitis are infected with *Chlamydia* species and the portion of these patients that proceed to asthma.

The reversibility of bronchial inflammation when chlamydial infections are treated is uncertain. In one small open-label research of patients in a single technique, bronchial obstruction was reversed in regarding one fifty percent of the patients that obtained antibiotic therapy [15]. The patients who reacted to anti-biotics had a tendency to have serologic proof of acute infection or infection for a much shorter period of time compared with the patients that did not react to antibiotic therapy. While this proof is still preliminary, it suggests that early treatment of persistent wheezing with agents effective against *Chlamydia* species may avoid the development of asthmatic signs in adults. Further

studies that confirm the efficiency of antichlamydial treatment would certainly be useful in assisting treatment decisions.

CONCLUSION:

Acute bronchitis is a widespread disease identified by fever and coughing that is usually wheezy in nature which may or may not be productive. The condition occurs when the bronchi end up being inflamed because of either viral or microbial infection. Signs normally last for 2 weeks, however the connected cough can last for as much as 8 weeks. Acute bronchitis needs to be separated from acute inflammation of the tiny airways- asthma or bronchiolitis- which normally provides as modern coughing accompanied by wheezing, tachypnea, respiratory distress, and hypoxemia. It ought to also be distinguished from bronchiectasis, a unique phenomenon associated with irreversible dilatation of bronchi and chronic cough. The diagnosis of acute bronchitis is developed in a patient that has the unexpected beginning of coughing, with or without sputum expectoration, and without evidence of pneumonia, the common cold, acute asthma, or an acute exacerbation of chronic bronchitis. Because pneumonia is not generally a self-limited disorder and has substantial morbidity and mortality when not adequately dealt with, the difference in between these two respiratory infections is particularly crucial. This is especially pertinent in the senior populace, in which a high index of suspicion is necessary due to the fact that pneumonia in persons in this age group is associated with a lower frequency of respiratory and nonrespiratory symptoms at the time of presentation.

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