



A study on prescribing trends in respiratory tract infections in a tertiary care hospital

Mohammed Abdul Ali², Mohammed Abdul Aala¹, Omer wasiq³, Syed Mujtaba Pasha⁴, Mohammed Mukaram⁵, Omar Sohail Ahmed⁴

¹Department of Pharmacology, Sultan-ul-uloom college of pharmacy, Hyderabad, India.

²Department of hospital and clinical pharmacy, Anwar-ul- uloom college of pharmacy, Hyderabad, India.

³Department of Pharmaceutics, Sultan-ul-uloom college of pharmacy, Hyderabad, India.

⁴Department of Pharmacology, Nalanda college of pharmacy, Hyderabad, India.

⁵Department of Pharmaceutics, Nalanda college of pharmacy, Hyderabad, India.

ABSTRACT

The drug utilization pattern of respiratory tract infections to assess the rational prescribing pattern at tertiary care teaching hospital, endorsing drugs by mark names may undermine a portion of the objectives of fundamental solution idea. Recommending by nonexclusive name causes the clinic drug store to have a superior stock control. This will likewise assist the drug store with purchasing drugs on contract premise, as the quantity of brands is less, in this manner decreasing the perplexity among drug specialists while apportioning. Bland medications are regularly more temperate than the marked ones. With respect to recommending of FDCs, Potential points of interest of FDC's incorporate lessened reactions, expanded patient consistence, cooperative energy and expanded adequacy and decreased cost, potential impediments incorporate unbendable settled measurements proportion, contrary pharmacokinetics, expanded harmfulness, doctor and drug specialist's obliviousness.

Keywords: Diseases; infection; respiratory tract.

ISSN: Awaiting
Research Article

Corresponding Author

Name: Omar Sohail Ahmed
Email: Omarbinahmed@gmail.com
Contact: + 91-9701839944

Article Info

Received on: 15-02-2019

Revised on: 26-03-2019

Accepted on: 28-03-2019



Copyright © 2019, Omar Sohail Ahmed, et al. A study on prescribing trends in respiratory tract infections in a tertiary care hospital, Production and hosting by Rubatosis Publications. All rights reserved.

INTRODUCTION

Respiratory tract infection (RTI) refers to any of a number of infectious diseases involving the respiratory tract. An infection of this type is normally further classified as an upper respiratory tract infection (URI

or URTI) or a lower respiratory tract infection (LRI or LRTI). Lower respiratory infections, such as pneumonia, tend to be far more serious condition than upper respiratory infection, such as the common cold.

TYPES

Upper respiratory tract infection: Although some disagreement exists on the exact boundary between the upper and lower respiratory tracts, the upper respiratory tract is generally considered to be the airway above the glottis or vocal cords. This includes the nose, sinuses, pharynx, and larynx.

Typical infections of the upper respiratory tract include tonsillitis, pharyngitis, laryngitis, sinusitis, otitis media, certain types of influenza, and the common cold. [1] Symptoms of URIs can include cough, sore throat, runny nose, nasal congestion, headache, low grade fever, facial pressure and sneezing.

The upper respiratory tract includes the sinuses, nasal passages, pharynx, and larynx. These structures direct the air we breathe from the outside to the trachea and eventually to the lungs for respiration to take place.

An upper respiratory tract infection, or upper respiratory infection, is an infectious process of any of the components of the upper airway.

Infection of the specific areas of the upper respiratory tract can be named specifically. Examples of these may include rhinitis (inflammation of the nasal cavity), sinus infection (sinusitis or rhinosinusitis) - inflammation of the sinuses located around the nose, common cold (nasopharyngitis) - inflammation of the nares, pharynx, hypopharynx, uvula, and tonsils, pharyngitis (inflammation of the pharynx, uvula, and tonsils), epiglottitis (inflammation of the upper portion of the larynx or the epiglottis), laryngitis (inflammation of the larynx), laryngotracheitis (inflammation of the larynx and the trachea), and tracheitis (inflammation of the trachea).

Upper respiratory infections are one of the most frequent causes for a doctor visit with varying symptoms ranging from runny nose, sore throat, cough, to breathing difficulty, and lethargy. In the United States, upper respiratory infections are the most common illness leading to missing school or work.

Although upper respiratory infections can happen at any time, they are most common in the fall and winter months, from September until March. This may be explained because these are the usual school months when children and adolescents spend a lot of time in groups and inside closed doors. Furthermore, many viruses of upper respiratory infection thrive in the low humidity of the winter.

Moreover, unique living beings require shifting time of beginning from when they enter the body to when side effects happen (hatching time). A portion of the basic pathogens for upper respiratory contamination and their particular hatching times are the accompanying *Thinoviruses*, 1-5 days; *Group A streptococci*, 1-5 days; *Influenza and parainfluenza infections*, 1-4 days; *Respiratory syncytial infection (RSV)*, 7 days; *Whooping hack (pertussis)*, 7-21 days; *Diphtheria*, 1-10 days; and *Epstein-Barr infection (EBV)*, 4 a month and a half.

The lower respiratory tract comprises of the trachea (wind pipe), bronchial tubes, the bronchioles, and the lungs.

Lower respiratory tract contaminations are by and large more genuine than upper respiratory diseases. LRIs are the main source of death among all irresistible diseases.^[2] The two most basic LRIs are bronchitis and pneumonia.^[3] Influenza influences both the upper and lower respiratory tracts, however more unsafe strains, for example, the profoundly vindictive H5N1 tend to tie to receptors somewhere down in the lungs.^[4]

Lower respiratory tract disease (LRTI), while regularly utilized as an equivalent word for pneumonia, can likewise be connected to different sorts of con-

tamination including lung sore and intense bronchitis. Side effects incorporate shortness of breath, shortcoming, fever, hacking and exhaustion.

There are various side effects that are normal for bring down respiratory tract contaminations. The two most normal are bronchitis and edema.^[3] Influenza influences both the upper and lower respiratory tracts.

Anti-infection agents are the main line treatment for pneumonia; in any case, they are not compelling or shown for parasitic or viral contaminations. Intense bronchitis commonly settle without anyone else with time.

In 2015 there were around 291 million cases.^[1] These brought about 2.74 million passages down from 3.4 million passages in 1990. This was 4.8% of all passing's in 2013.

Bronchitis portrays the swelling or irritation of the^[5] bronchial tubes. Furthermore, bronchitis is depicted as either intense or interminable relying upon its introduction and is additionally portrayed by the causative operator. Intense bronchitis can be characterized as intense bacterial or viral contamination of the bigger aviation routes in sound patients with no history of repetitive disease.^[3] It influences more than 40 grown-ups per 1000 every year and comprises of transient aggravation of the real bronchi and trachea.^[6] Most regularly it is caused by viral disease and consequently anti-microbial treatment isn't demonstrated in immunocompetent individuals.^{[7][5]} Viral bronchitis can once in a while be dealt with utilizing antiviral prescriptions relying upon the infection causing the contamination, and medicines, for example, calming medications and expectorants can help alleviate the symptoms.^{[8][5]} Treatment of intense bronchitis with antimicrobials is normal yet questionable as their utilization has just direct advantage weighted against potential reactions (sickness and spewing), expanded obstruction, and cost of treatment in a self-constraining condition.^{[6][9]} Beta2 agonists are some of the time used to ease the hack related with intense bronchitis. In an ongoing methodical audit it was found there was no proof to help their use.^[5]

Intense Exacerbations of Chronic Bronchitis (AECB) are every now and again due to non-infective causes alongside viral ones. Half of patients are colonized with *Haemophilus influenzae*, *Streptococcus pneumoniae* or *Moraxella catarrhalis*.^[3] Antibiotics have just been appeared to be viable if every one of the three of the accompanying indications are available: expanded dyspnoea, expanded sputum volume and purulence. In these cases 500 mg of Amoxycillin orally, like clockwork for 5 days or 100 mg doxycycline orally for 5 days ought to be used.^[3]

Causes

Regular Bacterial Infections:

- Haemophilus influenzae
- Staphylococcus aureus
- Klebsiella pneumonia

Atypical Bacterial Infections:

- Legionella pneumophila
- Mycoplasma pneumoniae
- Chlamydia pneumoniae
- Chlamydia psittaci

This rundown is deficient; you can help by extending it.

Parasitic contaminations:

- Respiratory cryptosporidiosis

Viral contaminations:

- Adenovirus
- Influenza A infection
- Influenza B infection
- Human parainfluenza infections
- Human respiratory syncytial infection
- SARS coronavirus
- Middle East respiratory disorder coronavirus and Dengue pneumonia

Treatment: Anti-toxins don't help the many lower respiratory contaminations which are caused by parasites or infections. While intense bronchitis regularly does not require anti-infection treatment, anti-infection agents can be given to patients with intense intensifications of ceaseless bronchitis.^[15] The signs for treatment are expanded dyspnoea, and an expansion in the volume or purulence of the sputum. ^[16] The treatment of bacterial pneumonia is chosen by thinking about the age of the patient, the seriousness of the ailment and the nearness of hidden ailment. Amoxicillin and doxycycline are appropriate for huge numbers of the lower respiratory tract diseases found as a rule rehearse.

Prevention: Vaccination helps prevent bronchopneumonia, mostly against influenza viruses, adenoviruses, measles, rubella, streptococcus pneumoniae, haemophilus influenzae, diphtheria, bacillus anthracis, chickenpox, and bordetella pertussis.^[17]

Diagnosis: A 2014 precise survey of clinical preliminaries does not bolster utilizing routine quick popular testing to diminish anti-toxin use for kids in crisis departments.^[5] It is misty if fast popular testing in the crisis office for kids with intense febrile respiratory diseases lessens the rates of anti-microbial utilize, blood testing, or pee testing.^[5] The relative hazard decrease of chest xbeam usage in kids screened with quick popular testing is 77% contrasted and controls.^[5] In 2013 specialists built up a breath analyzer that can speedily analyze lung infections.^{[6][7]}

MATERIAL AND METHODS

Trail condition: Respiratory tract infection

Trail type: Observational trail

Inclusion criteria: All the sufferers above 16 years newly recorded HIV sufferers on of either sex.

Exclusion criteria: We barred the patients who had gotten past treatment with anti-infection agents, the individuals who presented satisfied criteria for hospitalization, those with any conditions requiring the guide of different Persons for sedate organization, the individuals who had extreme touchiness to antimicrobial were excluded.

METHODOLOGY

This medication usage consider was led by Pharmacology division in Institute of Medical and Health Sciences to break down medication use design in respiratory diseases, in the wake of taking consent from the institutional morals board of trustees. A sum of 58 remedies of analyzed respiratory tract contamination cases were gathered from healing center and arbitrarily assessed for recommending design utilizing WHO tranquilize pointers. These pointers including number of medications per doctor prescribed, drugs recommended by mark names, settled dosage mixes, drugs from basic pharmaceutical rundown and medication details

Statistical analysis

Every one of the information incorporated into the database were encoded to guarantee privacy. The information contained in the chip were exchanged to the PC and handled with Power View program v. 1.3.2. (Aardex Ltd). Numerous openings of the compartment inside a time of under 15 min were not tallied. Elucidating measurements were utilized to depict the diverse adherence parameters saw in this

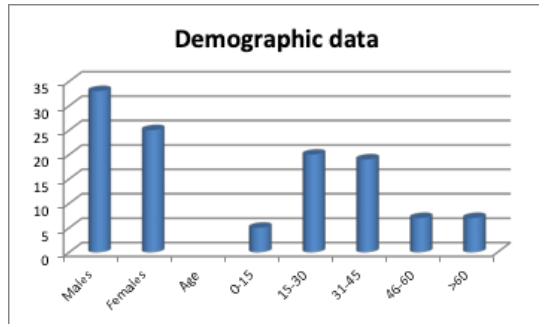
To examine we utilized Chi-square tests to analyze extents. The affectability, specificity, and positive and negative prescient estimations of oneself announced adherence question were resolved with a two-way possibility table, utilizing the adherence parameters given by MEMS as the best quality level. A calculated relapse display was built to distinguish factors essentially and freely connected with fantastic adherence. The factors were incorporated into the model on the off chance that they were related with a high score (with a p-estimation of < 0.05).

RESULTS AND DISCUSSION

An aggregate of 58 remedies were gathered from the healing facility. 33 (56.41%) patients were male and 25 (43.59%) were female, male: female proportion was 1:0.252 patients were >45 years, the most ordinarily influenced age gathering of patients (Table 1). The respiratory tract contaminations pervasiveness, 22 (38.46%) patients were analyzed as unending obstructive aspiratory sickness (COPD), 18 (30.76%) pneumonic tuberculosis, 10 (16.41%) bronchial asthma, 5 (8.20%) pneumonia and 3 (6.15%) of upper respiratory tract disease (URTI) individually (Figure 1).

Table 1: Demographic profile

	Parameters	Number (%)
SEX	Males	33
	Females	25
AGE	0-15	5
	15-30	20
	31-45	19
	46-60	7
	>60	7

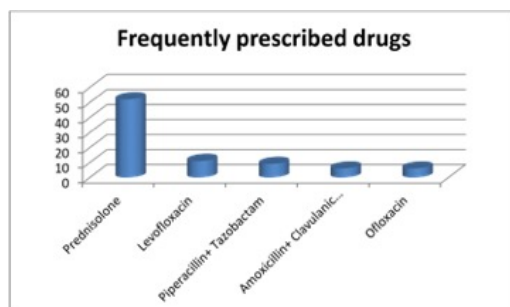
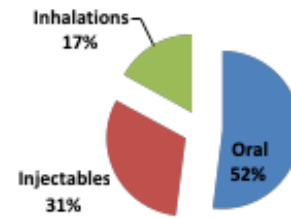

Figure 1: Demographic profile

Out of 126 recommended drugs, 42 (56.56%) anti-toxins, 17 (13.80%) bronchodilators, 16 (12.93%) corticosteroids, 8 (6.22%) stomach settling agents and 13 (10.41%) from the different class. The most usually endorsed corticosteroid was prednisolone 113(90.0%), and anti-infection agents were Levofloxacin 23 (18.40%), Piperacillin in addition to tazobactam 20(15.80%), Amoxicillin in addition to clavulanic corrosive 14 (11.11%) and Ofloxacin 13 (10.67%) individually (Table 2).

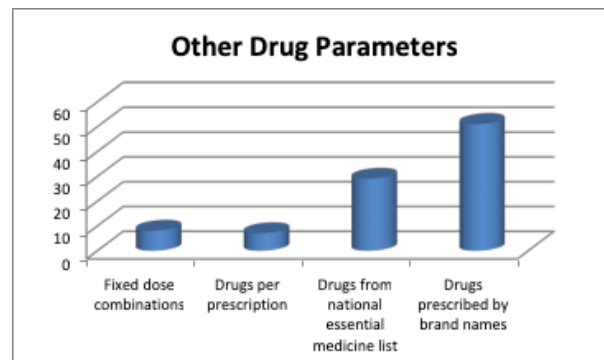
Table 2: Most frequently prescribed drugs

Drugs	Numbers
Prednisolone	52
Levofloxacin	11
Piperacillin+ Tazobactam	9
Amoxicillin+ Clavulanic acid	6
Ofloxacin	6

Medication plans endorsed, 66(52.61%) oral, 39 (30.62%) injectable and 21 (16.75%) inhalational (Figure 3). 17 (13.24%) settled measurements mix was recommended, 8.32 medications were endorsed per remedy, 62 (49.47%) drugs were from the national fundamental rundown of prescriptions 2015 and 112 (88.72%) drugs were recommended by mark names.


Figure 2: Most frequently prescribed drugs
Different drug formulations

Figure 3: Different drug formulations
Table 3: Other drug utilization parameters analyzed

Other Parameters	Number (%)
Fixed dose combinations	8
Drugs per prescription	7
Drugs from national essential medicine list	29
Drugs prescribed by brand names	51


Figure 4: Other drug utilization parameters analyzed

DISCUSSION

As of late, the examinations on medicate use have turned into a potential apparatus to be utilized in the assessment of social insurance frameworks. Medication use ponders used to investigate the diverse parts of the utilization of medications and to actualize methods for enhancing restorative quality. A sum of 585 patients of respiratory tract contaminations (RTIs) were incorporated into the investigation, 56.41% were guys, which is like the examination by Erabelly P et al where 51.11% of the patients were guys. 5 In present examination the most well-known maladies were perpetual obstructive aspiratory sickness (COPD), Pulmonary tuberculosis, Bronchial asthma, Pneumonia and upper respiratory tract diseases (URTIs), which is like the past studies.5,6 The most regularly influenced patients were has a place with >45 years old gathering, which is in connection with the prior investigation by Mahajan HM et al.6 The anti-microbials were most usually endorsed drugs which is in agreement to different past studies.5-8 In the present examination, the most ordinarily recommended anti-microbials was levofloxacin, in ponder by Pandit PR et al amoxicillin, though in contemplate by Errabelly P et al cephalosporins was the most normally recommended antibiotic.5,8 The most

generally endorsed settled measurements mix (FDC) in present investigation was Piperacillin+ Tazobactam, which is rather than the investigation by Mahajan et al, where the most widely recognized FDC was Amoxicillin+ clavulanic acid.⁶ In present investigation 52.61% oral, 30.62% injectable and 16.75% inhalational drugs were endorsed, while in another examination 86% medications were endorsed by oral and 14% by nasal route.⁹ Number of medications per remedy was 8.32 which is as opposed to the examination by Gogoi S et al where normal number of medications per solution was 6.92.⁷ In the present investigation 49.47% medications from national basic run-down of prescriptions 2015 were endorsed, while in past investigation 66.7% medications were recommended from NLEM.⁶ In the present examination the 88.72% medications were endorsed by mark name, which is as per the investigation by Mungrue K et al, where every one of the medications were endorsed by mark names.¹⁰ Prescribing by mark names might be a proof of enthusiastic limited time systems by pharmaceutical ventures. Recommending drugs by mark names may undermine a portion of the objectives of fundamental solution idea. Endorsing by bland name encourages the doctor's facility drug store to have a superior stock control. This will likewise assist the drug store with purchasing drugs on contract premise, as the quantity of brands is less, along these lines diminishing the perplexity among drug specialists while apportioning. Nonexclusive medications are regularly more sparing than the marked ones. As to recommending of FDCs, Potential favorable circumstances of FDC's incorporate decreased reactions, expanded patient consistence, cooperative energy and expanded viability and diminished cost, potential inconveniences incorporate unyielding settled measurement proportion, contradictory pharmacokinetics, expanded poisonous quality, doctor and drug specialist's numbness.

CONCLUSION

At the investigation site the prescribers are not having any standard anti-infection endorsing rules for RTIs nor are they following any standard rules accessible. Subsequently there is a need of instructive projects with a specific end goal to bring sane utilization of antimicrobials that requires improvement of standard rules for anti-microbial medicine

REFERENCES

1. Eccles MP, Grimshaw JM, Johnston M, et al. (2007). "Applying psychological theories to evidence-based clinical practice: identifying factors predictive of managing upper respiratory tract infections without antibiotics". *Implement Sci.* 2: 26. doi:10.1186/1748-5908-2-26. PMC 2042498. PMID 17683558.
2. Robert Beaglehole; et al. (2004). *The World Health Report 2004 - Changing History* (PDF). World Health Organization. pp. 120–4. ISBN 92-4-156265-X.
3. Antibiotic Expert Group. *Therapeutic guidelines: Antibiotic*. 13th ed. North Melbourne: Therapeutic Guidelines; 2006.
4. van Riel D, Munster VJ, de Wit E, et al. (April 2006). "H5N1 Virus Attachment to Lower Respiratory Tract". *Science*. 312 (5772): 399. doi:10.1126/science.1125548. PMID 16556800.
5. Jump up to:a b c Doan, Quynh; Enarson, Paul; Kisson, Niranjana; Klassen, Terry P.; Johnson, David W. (2014-09-15). "Rapid viral diagnosis for acute febrile respiratory illness in children in the Emergency Department". *The Cochrane Database of Systematic Reviews* (9): CD006452. doi:10.1002/14651858.CD006452.pub4. ISSN 1469-493X. PMID 25222468.
6. *Breath Test Could Sniff Out Infections in Minutes*. *Scientific American*. 11 January 2013. Retrieved 5 February 2013.
7. Zhu, Jiangjiang; Bean, Heather D; Wargo, Matthew J; Leclair, Laurie W; Hill, Jane E (2013). "Detecting bacterial lung infections:invivoevaluationofinvitrovolatile fingerprints". *Journal of Breath Research*. 7 (1): 016003. doi:10.1088/1752-7155/7/1/016003. PMC 4114336. PMID 23307645.
8. Smith, JD; MacDougall, CC; Johnstone, J; Copes, RA; Schwartz, B; Garber, GE (17 May 2016). "Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis". *CMAJ : Canadian Medical Association Journal*. 188 (8): 567–74. doi:10.1503/cmaj.150835. PMC 4868605. PMID 26952529.
9. Mohan H. *The Respiratory system*. Text book of Pathology, 4th ed. New Delhi: Jaypee Brothers Medical Publishers (Pvt) Ltd. 2000:438-9.
10. Prescribing of antibiotic for self-limiting respiratory tract infections in adults and children in primary care. *Nice Clinical Guidelines in UK*. 2008;8:69.
11. Khan IA, Shobha Rani RH, Subramanyam G. Efficacy and safety of azithromycin with various cephalosporins used in treatment of lower respiratory tract infection. *Indian J Pharm Pract*. 2009;1(2):53-61.
12. Gujar A, Tiwari P. Antimicrobial drug use in hospitalized children. *CRIPS* 2008;9(1):2-6. Beg MA et al. *Int J Res Med Sci*. 2017 Jun;5(6):2588-2591 *International Journal of Research in Medical Sciences* | June 2017 | Vol 5 | Issue 6 Page 2591
13. Errabelly P, Ramavath V, Afreen A, Sanaboina A. Analysis of the prescribing pattern of antibiotics

- in respiratory tract infections at department of medicine at a tertiary care teaching hospital. *IJPSR*. 2015;6(7):2693-97.
14. Mahajan HM, Date AP, Badwaik RT, Borkar AS, Wanmali SS, Gohad GV. Analysis of pattern of antimicrobial use in RTIs in a tertiary care hospital of central india-A drug utilization study. *J Cont Med A Dent*. 2014;2(3):59-64.
 15. Gogoi S, Saikia PP. A study on prescribing pattern of antibiotics for upper respiratory tract infections by general practitioners in rural areas of Assam. *IJSR*. 2015;4(5):60-2.
 16. Pandit PR, Kokanii V, Bhawe KA. Prescribing pattern of antimicrobials used for the treatment of acute respiratory tract infections in children. *IJARSAT*. 2016;18(1):171-75.
 17. Tiwari P, Ahlawat R, Gupta G. Prescription patients of upper respiratory tract infection at a pediatric outpatient clinic in Punjab. *Indian J Pharm Pract*. 2014;7(2):26-32.
 18. Mungrue K, Brown T, Hayes I Ramroop S, Thurston P, Pereira LP. Drugs in upper respiratory tract infections in pediatric patients in north Trinidad. *Pharm Pract*. 2009;7(1):29-33.
 19. Gupta N, Ansari KU. Fixed dose drug combinations: their uses, regulations and future prospects. *Antiseptic*. 1991;88:384-387
 20. Osler W Recent advances in medicine. *Science*. 1891;17170- 171
 21. McCaig LFHughes JM Trends in antimicrobial drug prescribing among office-based physicians in the United States. *JAMA*. 1995;273214- 219
 22. Gonzales RSteiner JFSande MA Antibiotic prescribing for adults with colds, upper respiratory tract infections, and bronchitis by ambulatory care physicians. *JAMA*. 1997;278901- 904
 23. Mainous AG IIIHueston WJClark JR Antibiotics and upper respiratory infection: do some folks think there is a cure for the common cold? *J Fam-Pract*. 1996;42357- 361
 24. Hamm RMHicks RJBemben DA Antibiotics and respiratory infections: are patients more satisfied when expectations are met? *J FamPract*. 1996;4356- 62
 25. Jacoby GA Prevalence and resistance mechanisms of common bacterial respiratory pathogens. *Clin Infect Dis*. 1994;18951- 957
 26. Cohen ML Epidemiology of drug resistance: implications for a post-antimicrobial era. *Science*. 1992;2571050- 1055
 27. Seppala HKlaukka TVuopio-Varkila J et al. The effect of changes in the consumption of macrolide antibiotics on erythromycin resistance in group A streptococci in Finland. *N Engl J Med*. 1997;337441- 446
 28. Kristinsson KG Effect of antimicrobial use and other risk factors on antimicrobial resistance in pneumococci. *Microb Drug Resist*. 1997;3117- 123
 29. Williamson HA A randomized, controlled trial of doxycycline in the treatment of acute bronchitis. *J FamPract*. 1984;19481- 486
 30. Verheij THermans JKaptein AMulder J Acute bronchitis: course of symptoms and restrictions in patients' daily activities. *Scand J Prim Health Care*. 1995;138- 12
 31. Cate TRCouch RBFleet WFGriiffith WRGerone PJKnight V Production of tracheobronchitis in volunteers with rhinovirus in a small-particle aerosol. *Am J Epidemiol*. 1965;8195- 105
 32. Monto ASCavallaro JJ The Tecumseh study of respiratory illness, II: patterns of occurrence of infection with respiratory pathogens, 1965-1969. *Am J Epidemiol*. 1971;94280- 289Google Scholar
 33. Foy HM Infections caused by *Mycoplasma pneumoniae* and possible carrier state in different populations of patients. *Clin Infect Dis*. 1993;17 ((suppl 1)) S37- S46
 34. Grayston JTAldous MBEaston A et al. Evidence that *Chlamydia pneumoniae* causes pneumonia and bronchitis. *J Infect Dis*. 1993;1681231- 1235
 35. Boldy DARSkidmore SJAyres JG Acute bronchitis in the community: clinical features, infective factors, changes in pulmonary function and bronchial reactivity to histamine. *Respir Med*. 1990;84377- 385
 36. Evans ASAllen VSueltmann S *Mycoplasma pneumoniae* infections in University of Wisconsin students. *Am Rev Respir Dis*. 1967;96237- 244
 37. Thom DHGrayston JTWang SPKuo CCAltman J *Chlamydia pneumoniae* strain TWAR, *Mycoplasma pneumoniae*, and viral infections in acute respiratory disease in a university student health clinic population. *Am J Epidemiol*. 1990;132248- 256