

International Journal of Research in Pharmacy and Science

Assessment of the Prescribing Pattern of Antibiotics with Corticosteroids in Infective Acute Exacerbation of Chronic Bronchitis - A Case Series

Soti Varun K.^{1*}, Sarangi B.¹, Deb Binayak², Alekya K.³, Thomas S.⁴, Elango K.⁴

¹Department of Pharmacology, Dr. K.N.Modi Institute of Pharmaceutical Education & Research, Modinagar, Uttar Pradesh, India

²Department of Pharmacology, NIMS Institute of Pharmacy, NIMS University, Jaipur, Rajasthan, India

³Department of Pharmacology, Long Island University, Brookville, New York, USA

⁴Department of Pharmacology, JSS College of Pharmacy, Ooty, Tamil Nadu, India

ABSTRACT

Chronic bronchitis has significant impact on morbidity.. The present study was conducted to assess the prescribing pattern of antibiotics along with systemic corticosteroids and the rationality of treatment in AECB patients. A six months retrospective study was conducted by assessing eighty one cases admitted to medical wards at a government secondary care hospital in Nilgiris, Tamil nadu. The average age of patients reported 50.58 years treated for duration of 11.58 days. 88.89% were smokers, 82.71% alcoholic and 59.25% tobacco/pan masala chewers. The most prescribed antibiotic was Cefotaxime. Others include- Cefixime, Ceftriaxone, Cephalexin, Amoxicillin, Ampicillin, Garamycin and Azithromycin. Most frequently prescribed systemic corticosteroids were Dexamethasone and Prednisolone. An average of 2.19 antibiotics was prescribed for AECB management. Increase in duration of treatment for individual patient was due to non-specific prescription. The prescribing of corticosteroids along with antibiotics could not reduce treatment duration because microbial inflammation was not controlled with antibiotics prescribed for them. It concluded that prescribing pattern of drugs is irrational. The increasing levels of antibacterial resistance among common respiratory tract pathogens implicated in AECB may threaten use of many currently recommended treatment options and has highlighted the need for alternative antibacterial agents.

KEYWORDS: Chronic bronchitis, prescribing pattern, antibiotics, corticosteroids, treatment

***Corresponding author**

Mr. Varun K. Soti

Assistant Professor, Department of Pharmacology

Dr. K.N. Modi Institute of Pharmaceutical Education & Research

Modinagar, Ghaziabad

Uttar Pradesh, India

Email: varunsoti@gmail.com

Phone no.: +91-9027511993

INTRODUCTION

Chronic bronchitis is one of the major causes of morbidity in developed countries and count among the principal causes of death worldwide. It is a condition characterized by a cough and excessive secretion of mucus in the tracheobronchial tree. This condition may be diagnosed when a patient reports production of sputum on most days during at least three consecutive months for more than two successive years^{1, 2}. Acute exacerbations of chronic bronchitis are characterized by an increase in cough, a change in the purulence or volume of sputum, or worsening dyspnoea. In patients with AECB, symptoms may worsen due to a bacterial super infection, a condition termed acute bacterial exacerbations of chronic bronchitis (ABECB). They have considerable impact on health care system³. The role of bacterial infection in exacerbations of chronic bronchitis and the use of sputum cultures to reach an etiological diagnosis to guide clinical management in this setting are subjects of current debate.^{4, 5, 6}

The gram positive bacteria i.e. *Streptococcus pneumoniae*, *Haemophilus influenza* and *Moraxella catarrhalis* account for over half the bacteria isolated in respiratory samples from patients with exacerbated chronic bronchitis and the figure may even reach 75%. Over 90% of patients with exacerbated chronic bronchitis are treated with antibiotics.^{7, 9, 10} The use of systemic corticosteroids along with antibiotics to treat infective acute exacerbations of chronic bronchitis (AECB) has become the common clinical practice in the recent years.^{6, 8, 11, 12} However patients are not cured completely due to the reason of developing resistance or irrational use of antibiotics. Therefore the present study was undertaken to assess the prescribing pattern of antibiotics along with systemic corticosteroids and rationality of the treatment given to patients suffering from acute exacerbations of chronic bronchitis.

EXPERIMENTAL

A six months retrospective study was conducted by reviewing the cases admitted to the medical wards between the periods of December 2009 to June 2010 at the Government Headquarters Hospital, Ooty. Based on the study criteria 81 cases were reviewed. The inclusion criteria were:

- a) male patients aged above 18 years and below 65 years suffering from chronic bronchitis reported with AECB;
 - b) bronchitis patients reported with comorbid conditions like respiratory and cardiovascular problems.
- The outpatients reported with AECB were excluded.

RESULTS AND DISCUSSION

The average age of the study patients reported with AECB was observed to be 50.58 years who were treated for an average duration of 11.58 days in the hospital. Out of 81 patients 88.89% were present smokers, 82.71% were alcohol consumers and 59.25% tobacco/pan masala chewers. The demographic characters of the patients are given in Table 1.

Table 1 : Demographic Characteristics of the Study Patients

S. No.	Social habits	Number of cases (n=81)
1	Smoking	
	Present smoker	72
	Past smoker	07
	Occasional smoker	02
2	Alcohol consumption	
	Present drinker	67
	Past drinker	12
	Occasional drinker	02
3	Tobacco/Pan masala chewer	
	Present chewer	48
	Past chewer	30
	Occasional chewer	03
4	Education Status	
	Uneducated	04
	Up to 5 th grade	17
	In between 5 th -12 th grade	42
	More than 12 th grade	18
5	Profession (in terms of monthly income)	
	No income(dependant)	02
	Up to Rupees 1000	07
	In between Rupees 1,000-5,000	25
	In between Rupees 5,000-20,000	32
	More than Rupees 20,000	15

Patients were observed to have co-morbid conditions like cardiovascular and respiratory problems. Two cases were diagnosed with hypertension and one case of known diabetes mellitus along with hypertension. Long standing pulmonary obstruction was found to have led to heart failure in one of the cases where patients had symptoms of failing heart like pedal oedema and dyspnoea with chest pain.

The most commonly prescribed antibiotic was Cefotaxime followed by Amoxicillin, Ampicillin, Garamycin, Cephalexin, Ceftriaxone and Azithromycin. The antibiotics were given along with corticosteroids to control the inflammation. Dexamethasone and Prednisolone were the frequently prescribed systemic corticosteroids.

The study findings suggest that during the treatment period, an average of four antibiotics were prescribed for AECB management. Antibiotic prescription needs to be based on culture sensitivity data which was not available in the case report forms reviewed. This could be the reason for irrational prescribing of antibiotics for treating infection.

Past medication history was not collected before prescribing the drugs for the current clinical presentation. Different antibiotic classes were used in infective exacerbation expecting involvement of multiple types without identifying the strains. Cephalosporins like cefotaxime, cephalexin need to be tested for resistant strains individually in the population of Nilgiris. The wide use of cefotaxime as prophylactic antibiotic and its irrational use for various other indications due to its wide spectrum activity could be a reason of developing resistance. The treatment duration was found to be increasing due to non-specific prescription for individual patient.

Although the patients were prescribed with systemic corticosteroids, duration of treatment could not be reduced due to the reason that microbial inflammation was not controlled with antibiotic prescribed for them.

CONCLUSION

The study findings suggest that there is irrationality in the prescribing pattern of drugs in infective AECB. The management should focus on not only symptomatic relief but also include preventive aspects such as patient education regarding self-management, smoking cessation, follow-up, and vaccination. The gradual increase in antibacterial resistance to antibiotics such as macrolides, cephalosporins and β -lactams may jeopardize the recommended mode of treatment and augurs novel therapeutic intervention in the AECB management.

REFERENCES

1. American Thoracic Society. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 1995; 152: S77–S121.
2. McGuire A, Irwin DE, Fenn P. The excess cost of acute exacerbations of chronic bronchitis in patients aged 45 and older in England and Wales. *Value Health.* 2001; 4: 370–375.

3. Sethi S. Infectious exacerbations of chronic bronchitis- diagnosis and management. *J Antimicrob Chemother.* 1999; 43(Suppl A): 97–105.
4. Anthonisen NR, Manfreda J, Warren CP et al. Antibiotic therapy in exacerbations of chronic obstructive pulmonary disease. *Ann Intern Med.* 1987; 106: 196–204.
5. Sethi S. Infectious etiology of acute exacerbations of chronic bronchitis. *Chest.* 2001; 117(5 Suppl 2): 380S–5S.
6. Rosell A, Monso E, Soler N. Microbiologic determinants of exacerbation in chronic obstructive pulmonary disease. *Arch Intern Med.* 2005; 165: 891–7.
7. Ball P. Epidemiology and treatment of chronic bronchitis and its exacerbations. *Chest.* 1995; 108(Suppl 2): 43S–52S.
8. Saint S, Bent S, Vittinghoff E *et al.* Antibiotics in chronic obstructive pulmonary disease exacerbations- a meta-analysis. *JAMA.* 1995; 273: 957–60.
9. Allegra L, Blasi F, de Bernardi B *et al.* Antibiotic treatment and baseline severity of disease in acute exacerbations of chronic bronchitis- a re-evaluation of previously published data of a placebo controlled randomized study. *Pulm Pharmacol Ther.* 2001; 14: 149–55.
10. Nouria S, Marghli S, Belghith M *et al.* Once daily oral ofloxacin in chronic obstructive pulmonary disease exacerbation requiring mechanical ventilation- a randomised placebo controlled trial. *Lancet.* 2001; 358: 2020–5.
11. Niewoehner DE. The role of systemic corticosteroids in acute exacerbation of chronic obstructive pulmonary disease. *Am J Respir Med.* 2002; 1: 243–8.
12. Wilson R, Allegra L, Huchon G. Short-term and long-term outcomes of moxifloxacin compared to standard antibiotic treatment in acute exacerbations of chronic bronchitis. *Chest.* 2004; 125: 953–64.