# The Preventive Effect of a Bacterial Extract (Broncho-Vaxom) in Chronic Bronchitis Complicated With COPD: A Clinical Trial

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## Abstract

**Objective** To investigate the effect of oral immunostimulant Broncho-Vaxom on the frequency and severity of acute exacerbation in patients with chronic bronchitis accompanied with chronic obstructive pulmonary disease (COPD).

**Methods** Ninety patients with chronic bronchitis complicated with COPD were randomly divided into A and B groups. Forty-nine subjects in group A received oral capsules containing 7mg of Broncho-Vaxom while 41 in group B received similar capsules with placebo. Both groups took one capsule daily for first 10 days each month for 3 consecutive months. Frequency of acute exacerbation, symptom scores and lung function were recorded for the following one year.

**Result** There was a significant decrease ($p<0.01$) in the number of acute exacerbation, duration and severity, as well as shortening the course of antibiotics administration and the dosage of bronchodilator and mucolytic ($p<0.05$) in group A when comparing with group B. Symptom scores for cough, sputum, dyspnea as well as physical signs on auscultation of chest also improved significantly ($p<0.05$) in group A as compared with group B. Bacterial clearance rate from sputum culture in those who received no antibiotics for the first 3 month was significantly higher ($p<0.01$) in group A than in group B.

**Conclusion** Orally administered Broncho-Vaxom was associated with a decrease in the number of acute exacerbation, and a decrease in the use of antibiotics and symptomatic relief medications in patients with chronic bronchitis accompanied with COPD. It was also associated with a decrease in the scores of symptoms. Without causing any apparent adverse effect, it might also help to eradicate the pathogenic bacteria in the airways.

## Introduction

The chronic obstructive pulmonary disease (COPD) is termed as a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles and gases[1]. Mostly, COPD develops from chronic bronchitis (CB), in which, respiratory tract infections (RTIs) are the most frequent factor contributing to acute exacerbations. Antibiotics are considered to be effective in the management of those infections. However, repeated and/or over-dose uses of antibiotics have led to the development of genetic mutations in pathogenic germs and insensitivity or resistance to antibiotics in some common bacteria. It is seemingly important to improve the immune function in CB patients regarding prevention of acute respiratory tract infections. Broncho-Vaxom (OM-85 BV) is a lyophilized extract from 8 bacteria species frequently responsible for upper respiratory tract infections. The present study was to investigate the benefits of OM-85 BV in prophylaxis of acute exacerbation in CB patients complicated with COPD.

## Patients and Methods

Ninety patients aged 55-82, comprising 49 males and 41 females, were included in this study. All of them fulfilled the case definition and diagnosis criteria of CB and COPD. The patients were randomized to receive Broncho-Vaxom (Group A, n=49, 27 males and 22 females, aged 67±4 yrs) or placebo (Group B, n=41, 22 males and 19 females, aged 65±5 yrs) according to figure 1. Additional treatments including Theophylline and antibiotics were allowed as required.

All patients were evaluated before treatment and at 3-, 6- and 12-month intervals after treatment for symptom scores, pulmonary rales ratings, acute exacerbation (episodes, days and severity), use of antibiotics,need for Combivent and mucolytic, FVC, FEV1, bacterial culture of the first spit of morning sputum after mouth-rinsing in patients free of antibiotics throughout months 1 to 3, and any possible adverse effects. The severity of acute exacerbation was rated as: 1=mild, sum of scores of cough + sputum + dyspnea + rales ranged 1-4; 2=moderate, sum of scores ranged 5-8; 3=severe, sum of score ranged 9-12. All these data for evaluation were collected in the morning before 12 o'clock.

## Results

**Acute exacerbations and use of antibiotics**
Followed up for one year, patients in OM-85 BV group experienced less episodes, days and severity of acute exacerbation as compared with their condition during the year before the study as well as with that of patients in the other group, who showed no improvements ($P<0.01$). Similar result was also observed with the use of antibiotics ($P<0.01$, Fig 1).

**Use of symptom controller medication**
Use of Combivent MDI and Gelomyrtol Forte in Group A was less as compared with that in Group B at 3-, 6- and 12-month intervals post-treatment ($P<0.05$, Tab 1).

**Clinical symptoms and signs**
As compared with Group B, significant improvements were found in Broncho-Vaxom group in symptom of sputum expectoration as assessed at 3-, 6- and 12-month intervals post-treatment ($P<0.01$), cough and pulmonary rales at months 3 and12 ($P<0.05$), and dyspnea at month 12 ($P<0.05$, Fig 2).

**Pulmonary ventilation function**
There was no improvement among patients in either group with regards to pulmonary ventilation function (FVC and FEV1) before treatment and at 3-, 6- and 12-month intervals after treatment ($P>0.05$). The two groups were also similar in FCV and FEV1 at all these time points ($P>0.05$).

**Results of sputum culture**
The positive rate of sputum bacterial culture before treatment in Group A was 37.3% vs 36.8% in Group B, with no significant difference between each other. Sixteen out of the 18 patients in Group A were positive in sputum culture before treatment, and 15 of them were improved in numbers of bacterial colonies or became germ-negative after 3-month treatment with Broncho-vaxom. On the contrary, the 5 patients in Group B with positive bacterial culture result before the trial showed no improvement over the same period. ($P<0.05$ by corrected chi-square between-group test)

**Tab1. Symptom controller medication in the two groups ( $\bar{x}\pm s$ )**

| | Before | | Month 3 | | Month 6 | | Month 12 | |
|---|---|---|---|---|---|---|---|---|
| | Group A | Group B | Group A | Group B | Group A | Group B | Group A | Group B |
| [1] Protheo (mg/d) | 400±0 | 400±0 | 400±0 | 400±0 | 400±0 | 400±0 | 400±0 | 400±0 |
| [2] Becotide (g/d) | 600±0 | 600±0 | 600±0 | 600±0 | 600±0 | 600±0 | 600±0 | 600±0 |
| [3] Combivent (puff/d) | 10.1±2.4 | 9.8±1.7 | 7.1±3.4* | 8.9±2.6 | 7.0±2.6* | 8.3±2.5 | 7.6±2.2* | 9.0±2.3 |
| [4] Gelomyrtol Forte (g/d) | 0.81±0.4 | 0.85±0.2 | 0.43±0.2** | 0.89±0.4 | 0.45±0.1* | 0.87±0.3 | 0.62±0.2 | 0.76±0.1 |

[1] Theophylline sustained release tablets
[2] Beclomethasone dipropionate metered dose inhaler
[3] Ipatropin/Salbutamol metered dose inhaler(50/120 μg per puff)
[4] Myrtol capsule
Compared with group B *:$p<0.05$, **:$p<0.01$.

## Conclusion

Oral administered Broncho-Vaxom may reduce the incidence of acute exacerbation and the severity of each episode, shorten the exacerbation days and decrease the antibiotic use in chronic bronchitis complicated with COPD. Symptoms of patients were also relieved and the use of symptom controller medication reduced during treatment with BV. Broncho-Vaxom might also help to clear the pathogenic bacteria from the airways.

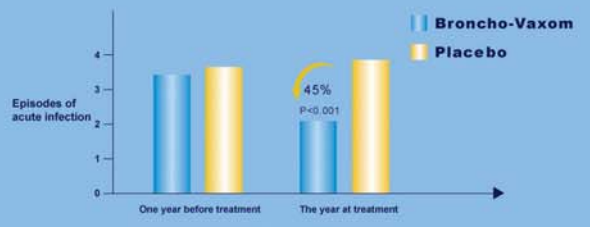


Fig 1

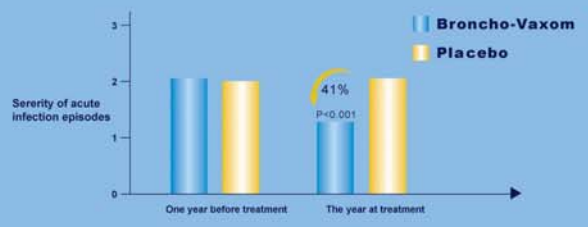


Fig 2