TREATMENT OF ACUTE BRONCHITIS IN ADULTS WITH A PELARGONIUM SIDOIDES PREPARATION (EPs® 7630): A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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Background: Acute bronchitis is a widespread medical problem, and, although predominantly caused by viruses, antibiotics are still prescribed unnecessarily. Therefore, it is of utmost importance to evaluate the use of alternative treatments for acute bronchitis.

Objective: To evaluate the efficacy and safety of a *Pelargonium sidoides* preparation (EPs 7630 is a registered trademark of Dr. Willmar Schwabe GmbH & Co. KG, Karlsruhe, Germany) compared with placebo in patients with acute bronchitis.

Design: Randomized, double-blind, placebo-controlled trial using a design with planned interim analyses.

Setting: Six outpatient clinics.

Patients: One hundred twenty-four adults with acute bronchitis present ≤48 hours, Bronchitis Severity Score (BSS) ≥five points, and informed consent.

Intervention: EPs 7630 or placebo (30 drops three times daily) for seven days.

Measurements: The primary outcome criterion was the change of BSS on day seven.

Results: The decrease of BSS from baseline to day seven was 7.2 ± 3.1 points with EPs 7630 (n = 64) and 4.9 ± 2.7 points with placebo (n = 60). The 95% confidence interval for the difference of effects between the two treatment groups (EPs 7630 minus placebo) was calculated as (1.21, 3.56) showing a significant improvement of EPs 7630 compared with placebo on day seven ($P < .0001$). For each of the five individual symptoms, rates of complete recovery were considerably higher in the EPs 7630 group. Within the first four days, onset of treatment effect was recognized in 68.8% of patients in the EPs 7630 group compared with 33.3% of patients in the placebo group ($P < .0001$). Health-related quality of life improved more in patients treated with EPs 7630 compared with placebo-treated patients. Adverse events occurred in 25 of 124 patients (EPs 7630: 15/64 patients, placebo: 10/60 patients). All adverse events were assessed as nonserious.

Conclusions: EPs 7630 was superior in efficacy compared with placebo in the treatment of adults with acute bronchitis. It may therefore offer an effective alternative for acute bronchitis unless antibiotics are clearly indicated.

Key words: Acute bronchitis, double-blind, placebo-controlled, clinical trial, EPs 7630, *Pelargonium sidoides* preparation, herbal medicine, randomized controlled trial

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INTRODUCTION

Acute bronchitis is one of the most frequent infections encountered in general practice and takes a top place under the notifications of days off work.[1,2] It is predominantly caused by a viral infection with RNA viruses, particularly the respiratory syncytial virus (RSV), followed by coxsackie, influenza, parainfluenza, and ECHO viruses or adenoviruses. Treatment of acute bronchitis is primarily symptomatic. Although acute bronchitis is treated with antibiotics in up to 70% of cases, the duration of the disease is not substantially shortened by this practice.[3-6] The risks associated with initial antibiotic treatment include gastrointestinal adverse effects, allergic reactions, and development of resistant bacteria leading to a longer duration of treatment and relapse.[7,8] An alternative treatment of acute bronchitis with potential efficacy is the preparation from *Pelargonium sidoides* (marketed in Germany as Umckaloabo; manufacturer: ISO Pharmaceuticals, Ettlingen, Germany) (Umckaloabo is a registered trademark of Dr. Willmar Schwabe GmbH & Co. KG, Karlsruhe, Germany). The liquid herbal drug preparation from *Pelargonium sidoides* root is also referred to as EPs 7630 (EPs 7630 is a registered trademark of Dr. Willmar Schwabe GmbH & Co. KG, Karlsruhe, Germany) and is an approved drug in Germany, in the Commonwealth of Independent States (CIS), in the Baltic states, in Turkey, in Brazil, and in Mexico for the treatment of upper respiratory tract infections. Recent investigations have provided some explanation of the mechanism of action of EPs 7630, which is thought to be related to antimicrobial[9] and immune-modulatory[10,11] properties. Antimicrobial and immune-modulatory effects have been demonstrated for polymeric polyphenols (eg, catechin, gallocatechin, gallic acid), the principal

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constituents of EPs 7630, and for coumarines (eg, umckalin). The immune-modulatory activities are mediated mainly by the release of tumor necrosis factor (TNF-α) and nitric oxides (iNO), the stimulation of interferon β (INF-β), and the increase of natural killer cells (NK) activity.[11]

To date, successful treatment of acute bronchitis with *Pelargonium sidoides* has been reported in several observational studies[12,13] and a controlled study with children.[14] In a recently published randomized placebo-controlled trial with adults,[15] EPs 7630 was superior in efficacy compared with placebo, clearly reduced the severity of symptoms, and shortened the duration of sick leave by nearly two days. The present clinical trial was designed to evaluate the efficacy and safety of EPs 7630 compared with placebo in patients with acute bronchitis.

METHODS

The trial adhered to the Declaration of Helsinki 1964; the Revisions of Tokyo 1975, Venice 1983, Hong Kong 1989, and Somerset-West 1996; and the Guideline for Good Clinical Practice (GCP) 1997 CPMP/ICH/135/95).[16,17]

Patients

Approval by the ethics commission of the Russian State Research Institute of Pulmonology was given in February 2000. From April 2000 to March 2001, the trial was conducted at six urban primary care outpatient clinics. Patients, who met the following inclusion criteria, were deemed suitable for the trial: age $\geq$18 years, acute bronchitis with a Bronchitis Severity Score (BSS[15]) $\geq$five points, and duration of complaints $\leq$48 hours. The diagnosis of acute bronchitis was additionally confirmed on clinical symptoms as described elsewhere.[7,18]

Exclusion criteria were as follows: indication for antibiotic treatment (eg, suspected pneumonia) or treatment with antibiotics during the past four weeks before inclusion in the trial; allergic bronchial asthma; tendency to bleed; severe heart, renal, or liver diseases; immunosuppression, known or supposed hypersensitivity to the investigational medication; concomitant medication that might impair the study results (eg, antibiotics) or supposed interactions of the concomitant medication with the investigational medication; participation in another clinical trial during the past three months; patients who are known or suspected by their mental capability to be noncompliant; or patients unable to understand the nature, meaning, and consequences of the trial.

Study Design

The study was a multicenter, prospective, randomized, parallel-group, double-blind, placebo-controlled clinical trial. It was planned according to a group sequential adaptive that allows for early stopping and sample size recalculation in case of continuation.[19-21] The primary objective was to evaluate the efficacy and safety of EPs 7630 compared with matched placebo in patients with acute bronchitis. The primary outcome criterion for assessing the efficacy of EPs 7630 compared with placebo was the change of BSS on day seven. BSS scores the most important features of acute bronchitis, namely, cough, sputum, rales/rhonchi, chest pain during coughing, and dyspnea. Each symptom was assessed by the investigator using a verbal five-point rating scale ranging from zero to four (zero: absent; one: mild; two: moderate; three: severe; four: very severe). Secondary outcome criteria were as follows: BSS $<$five points at study end, decrease of BSS $\geq$five points between baseline and study end, onset of treatment effect, consumption of paracetamol, change of individual symptoms of BSS, patients' health status using the health-related quality of life questionnaires (SF-12 Health Survey, EQ-5D).[22-27] Furthermore, treatment outcome, both by the patient and the investigator, using the Integrative Medicine Outcome Scale (IMOS) consisting of a five-point rating scale ("complete recovery," "major improvement," "slight to moderate improvement," "no change," "deterioration"),[15] and satisfaction with treatment were assessed, utilizing the Integrative Medicine Patient Satisfaction Scale (IMPSS), a five-point scale, comprising the ratings "very satisfied," "satisfied," "neutral," "dissatisfied," "very dissatisfied."[15] The safety of treatment was assessed with respect to frequency, nature, and severity of adverse events (AEs) to tolerability assessed by investigators and by patients using a verbal four-point rating scale and the results of laboratory tests including leukocytes, erythrocyte sedimentation rate, γ-glutamyl transpeptidase, aspartate aminotransferase, alanine aminotransferase, Quick test, and partial thromboplastin time (PTT).

After completing informed consent, eligible patients were randomly allocated to one of two treatment groups according to a list generated on a computer by block randomization. For the patients who were not enrolled, all reasons were documented. With enrollment, every patient was assigned the lowest patient number for randomization that was available at the respective center and received the investigational medication with the respective patient number. The research staff was blinded to treatment allocation assignment and the data that were collected at all time points.

At baseline visit (day zero), demographic data, symptoms typical for acute bronchitis, history of present illness, and clinical findings including laboratory results as well as macroscopic and microbiologic examination of sputum were obtained. The study medication and patient diary were provided to the patient at baseline. Following enrollment, examinations occurred on days three through five and day seven. At each contact, the investigator assessed the clinical status of the patients, reviewed the patient diary, documented the consumption of investigational medication and of paracetamol as well as any change in concomitant medications, and asked about occurrence of any AEs. Treatment outcome and tolerability were assessed separately by the patient and the investigator. On day seven or at premature withdrawal of the patient, there was a final assessment including laboratory tests and sputum examination. In addition, the patient was asked to assess the length of time until onset of treatment effect as well as satisfaction with treatment.

The investigational medication was administered in bottles of 50 mL containing either EPs 7630 (100 g finished product contain 80 g EPs 7630; additional ingredient of the finished product: 20 g glycerol 85%) or placebo. Placebo was matched

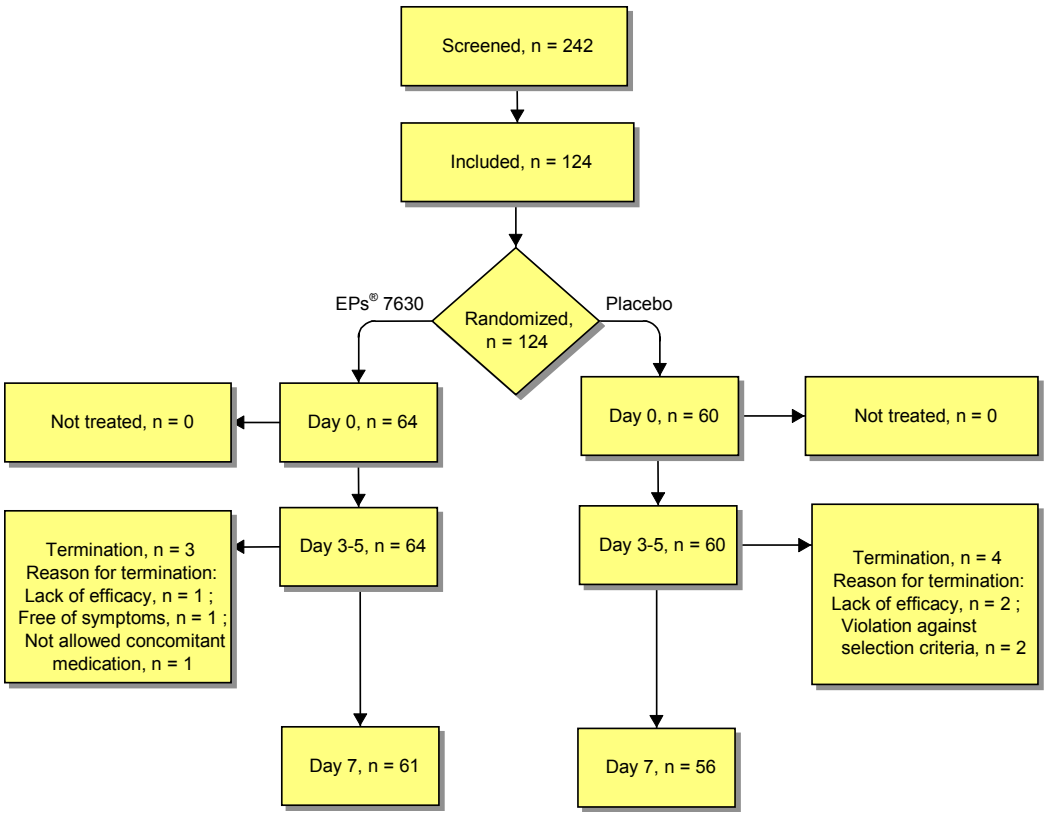


Figure 1. Flowchart including reasons for withdrawals.

to a formulation of EPs 7630 with regard to color, smell, and taste as well as viscosity. The medication was manufactured by Dr. Willmar Schwabe GmbH & Co. KG, Karlsruhe, Germany. The formulation of EPs 7630 and its botanical origin were identical to the finished commercial product, Umckaloabo (ISO Arzneimittel GmbH & Co. KG, Ettlingen, Germany). The investigators were blinded to the treatment allocation assignment.

The patients were instructed to take 30 drops three times daily (4.5 mL per day) at 30 minutes before or after the meals starting at day zero (after baseline visit) and continuing until day seven (prior to last visit). Any other medication that had been taken within the past six months or in parallel to the investigational medication had to be documented. In case of fever (≥39.0°C), paracetamol tablets 500 mg were allowed. Criteria for withdrawals were as follows: no decrease of BSS compared with baseline (nonresponder), complete recovery, intake of prohibited medications (eg, antibiotics), occurrence of AEs, or lack of compliance.

All data collected were entered by the investigators into notebook computers using an electronic case report form (eCRF) and transmitted via modem to the data collection center at the contract research organization (CRO). Monitoring was conducted according to ICH GCP guidelines.[17] The monitor checked daily the data entered into the eCRFs for completeness and plausibility using the implemented monitoring tools. On-site monitoring visits including source data verification occurred every four weeks at each study site.

In-house and on-site audits as well as a system audit at the external CRO were performed. No deviations from GCP were found. Treatment allocation was sealed and remained so until the end of the study.

Statistical Analysis

For all interim analyses as well as the final analysis, separate analyses plans were made based on blind data reviews according to ICH guidelines E9 and E10.[28] The experiment-wise type I error rate was set at $\alpha = 0.025$ (one-sided). The critical values of the group sequential test design were calculated for the standardized cumulative test statistic based on Pocock's design.[29] For one-sided $\alpha = 0.025$, the resulting adjusted significance levels at each interim analysis k were given by $\alpha_k = 0.007907$ with corresponding critical values $Z_k = 2.413$ each (k = one, two, three, four). All interim and final confirmatory statistical analyses of the primary outcome variable were based on all available data according to the intention-to-treat principle. The last observation carried forward (LOCF) procedure was applied in case of premature withdrawal from the trial. All confirmatory comparisons of the two treatments were carried out as planned, namely as two-factorial analysis of covariance on the primary outcome variable with the two factors treatment group and site and with

Table 1. Demographic Information and Other Characteristics at Baseline (Values = Number of Patients, n = 124, ITT-analysis).

Demographic Information	EPs 7630 (n = 64)	Placebo (n = 60)
Male	15	22
Female	49	38
Mean age ± SD, y	36.2 ± 13.0	35.9 ± 13.2
Mean height ± SD, cm	168.2 ± 8.5	169.2 ± 8.4
Mean weight ± SD, kg	71.9 ± 15.0	68.8 ± 14.4
History of respiratory infections*		
Bronchitis (chronic/seldom)	0/30	0/27
Angina tonsillaris (chronic/seldom)	0/9	3/12
Rhinopharyngitis (chronic/seldom)	3/31	1/31
Otitis media (chronic/seldom)	0/6	1/4
Other (chronic/seldom)	1/3	2/1
Pre-treatment of respiratory tract infections*	22	19
Antibiotics	4	1
Acetylcysteine	2	0
Antitussives	13	9
Symptomatic treatment	10	10
Other	5	6
Smoker status		
Current smoker	16	15
Ex-smoker	10	19
Never smoker	12	13
No remark or classification not possible	26	13

*Multiple responses possible.

the baseline value as a covariate. Results are displayed as means ± standard deviation. For confirmatory analysis, 95% repeated confidence intervals (RCIs) were calculated.[19-21]

RESULTS

Baseline, Compliance, and Withdrawals

All of the 124 of 242 (51.2%) patients who met the criteria above and gave their written informed consent for trial participation were enrolled and randomized in sequence at each study site into the two treatment groups. Therefore, the data of 124 patients were analyzed on an intention-to-treat basis: 64 of 124 patients received EPs 7630 and 60 of 124 patients received placebo. By day seven, three of 64 patients of the EPs 7630 group and four of 60 patients of the placebo group had dropped out. Details for withdrawals are presented in Figure 1.

Among the 124 patients in the ITT data set, the predominance of females was slightly higher in the EPs 7630 group (EPs 7630: 49/64 patients [76.6%]; placebo: 38/60 patients [63.3%]). Demographic and baseline characteristics are listed in Table 1. History of respiratory tract infections and pretreatment of respiratory tract infections as well as number of current smokers were similar in both groups. The final analysis was carried out after all patients enrolled had completed the trial, and the database was finally cleaned and locked.

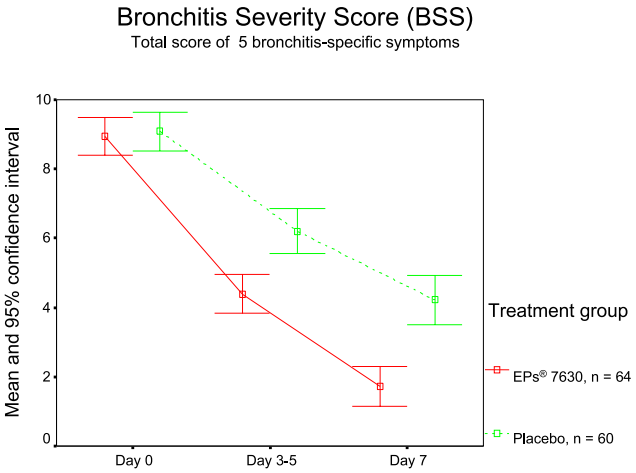


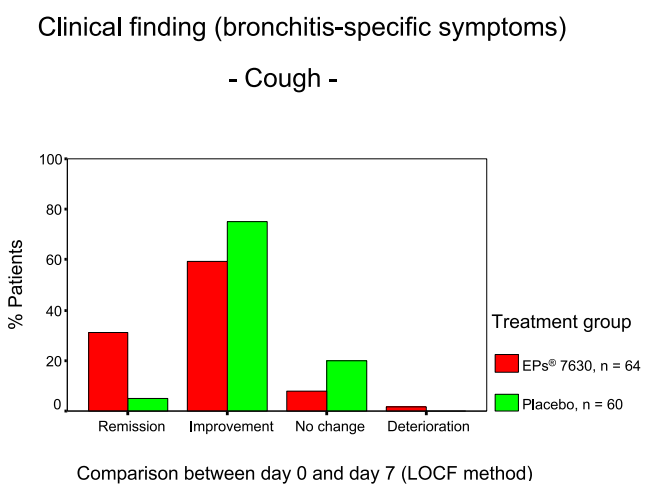
Figure 2. Decrease of the Bronchitis Severity Score (BSS) under EPs 7630 compared with placebo (n = 124, ITT analysis).

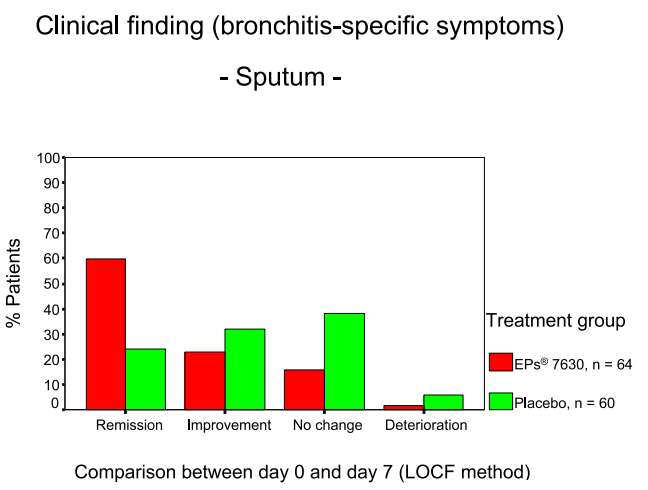
Efficacy Evaluation

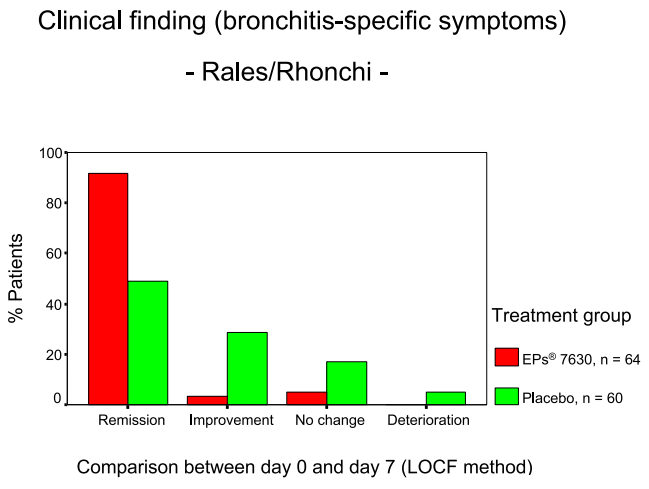
Primary efficacy. At baseline, BSS was similar in both treatment groups (9.0 ± 2.2 points in the EPs 7630 group, 9.1 ± 2.2 points in the placebo group). The decrease of BSS over time is shown in Figure 2. On day seven (LOCF), BSS decreased by 7.2 ± 3.1 points with EPs 7630 and by 4.9 ± 2.7 points with placebo ($P < .0001$). The 95% RCI for the difference of effects between the two treatment groups (EPs 7630 minus placebo) was calculated as (1.2, 3.6) showing a highly significant superiority of EPs 7630 compared with placebo on day seven. This superiority of EPs 7630 was noticeable at the first follow-up contact (days 3-5) already (BSS: 4.4 ± 2.2 points under EPs 7630, 6.2 ± 2.5 points under placebo, $P < .0001$).

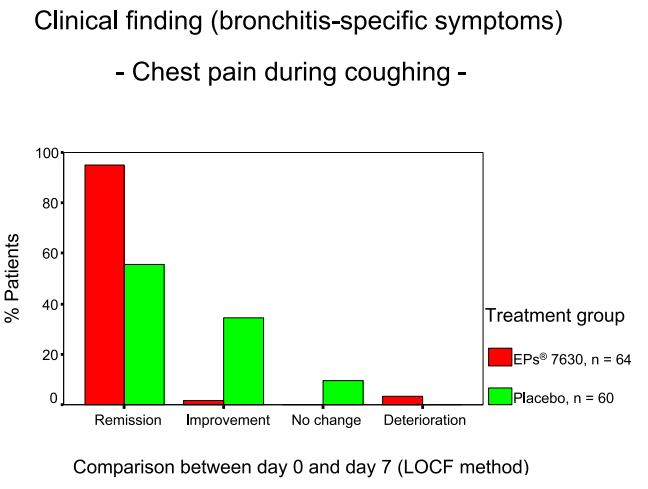
Secondary efficacy. Response criteria based on BSS on day seven: A BSS of less than five points was observed in 61 of 64 patients (95.3%) with EPs 7630 compared with 35 of 60 patients (58.3%) with placebo ($P < .0001$). A decrease of BSS of at least five points compared with baseline was seen in 58 of 64 patients (90.6%) treated with EPs 7630 and 31 of 60 patients (51.7%) treated with placebo ($P < .0001$). Rapid recovery, defined as fulfillment of both of outcomes above, was observed in 58 of 64 patients (90.6%) with EPs 7630 and 25 of 60 patients (41.7%) with placebo ($P < .0001$).

Individual symptoms of BSS on day seven: For each of the five individual symptoms, the rate of complete recovery on day seven was considerably higher in the EPs 7630 group (Figure 3). The assessments by the physicians agreed well with the self-assessments by the patients. Only negative final assessments of change under placebo were more frequent in the patients' self-assessments than in the investigators' assessments. At the final









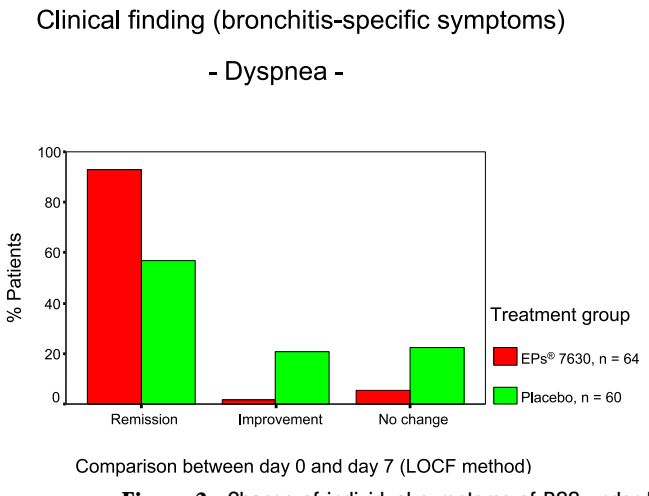


Figure 3. Change of individual symptoms of BSS under EPs 7630 compared with placebo (n = 124, ITT analysis).

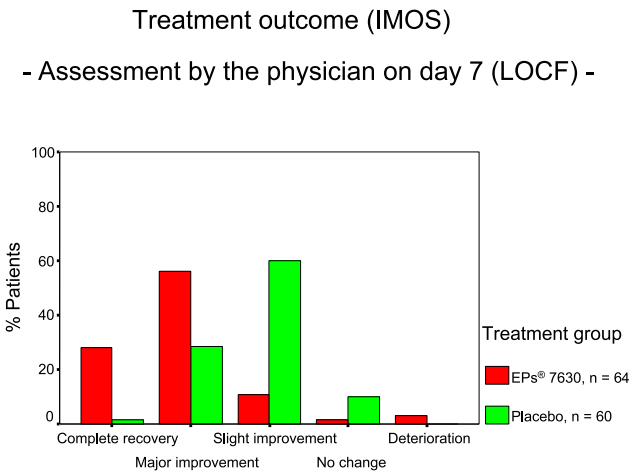


Figure 4. Treatment outcome under EPs 7630 compared with placebo (n = 124, ITT analysis).

visit, recovery rates for the symptoms rales/rhonchi, chest pain during coughing, and dyspnea exceeded 90% among the patients in the EPs 7630 group presenting with the respective symptoms at baseline. Among the corresponding patients in the placebo group, the recovery rates of these three symptoms remained below 60%. For example, on day seven, rales/rhonchi had disappeared in 55 of 60 patients (91.7%) under EPs 7630 and in 29 of 59 patients (49.2%) under placebo ($P < .0001$), and chest pain during coughing had disappeared in 55 of 58 patients (94.8%) of the EPs 7630 group and 29 of 52 patients (55.8%) of the placebo group ($P < .0001$). Among the five symptoms, cough was the symptom with the highest baseline scores and the slowest recovery in both groups. In the EPs 7630 group, cough disappeared in 20 of 64 patients (31.3%) compared with three of 60 patients (5.0%) in the placebo group ($P < .0001$).

Further clinical symptoms on day seven: All five additional symptoms showed higher recovery rates in the EPs 7630 group compared with placebo. The highest recovery rates were found for fever (EPs 7630 group: 93.2%; placebo group: 82.9%) and for pain in the limbs (EPs 7630 group: 92.9%; placebo group: 76.9%), followed by headache (EPs 7630 group: 86.7%; placebo group: 77.8%) and fatigue/exhaustion (EPs 7630 group: 84.1%; placebo group: 66.1%). The weakest but most different recovery rates were found for the symptom hoarseness. On day seven, hoarseness had disappeared in 45 of 58 patients (77.6%) under EPs 7630 and in 20 of 52 patients (38.5%) under placebo ($P < .0001$).

Treatment Outcome and Onset of Treatment Effect

On the IMOS, recovery and improvement were seen by the physicians more frequently in the EPs 7630 group (Figure 4). On day seven, 54 of 64 EPs 7630-treated patients (84.4%) but only 18 of 60 patients under placebo (30.0%) were assessed as major improved or completely recovered. Patients' assessments showed a very strong agreement with the assessments by physicians. This assessment was already pronounced on days three to five. Forty-three of 64 patients (67.2%) of the EPs 7630 group showed "major improvement" or "complete recovery" as compared with 11 of 60 patients (18.3%) in the placebo group.

With regard to the onset of treatment effect, patients noticed an effect earlier with EPs 7630 than with placebo. Two of 64 (3.1%) patients receiving EPs 7630 reported an effect within two to five hours, 14 of 64 (21.9%) within one to two days, 28 of 64 (43.8%) within three to four days, 17 of 64 (26.6%) within five to six days, and two of 64 (3.1%) stated not having noticed any effect during the treatment period. In the placebo group, no patient had noticed an effect within two to five hours, six of 60 (10.0%) patients reported an effect within one to two days, 14 of 60 (23.3%) within three to four days, 26 of 60 (43.3%) within five to six days, and 14 of 60 (23.3%) stated not having noticed any effect. Thus, within the first four days, onset of treatment effect was recognized in 44 of 64 patients (68.8%) with EPs 7630 compared with 20 of 60 patients (33.3%) with placebo ($P < .0002$).

Health-Related Quality of Life

At baseline, self-assessments in both groups were comparable on the five dimensions of EQ-5D. On day seven, remission was reported by the majority of patients receiving EPs 7630, whereas, with placebo, there were as many patients reporting "remission" as patients with "no change" (Figure 5). Overall, EPs 7630 was associated with less impairment. Group differences were most marked in pursuance of "usual activities" (78.2% vs 34.8%, respectively), followed by "mobility" (85.0% vs 54.1%, respectively), "anxiety/depression" (78.0% vs 48.8%, respectively), and "pain/discomfort" (78.0% vs 47.3%, respectively) and were still found in "self-care" (90.5% vs 75.0%, respectively). In addition, EQ-VAS increased by 34 units in the EPs 7630 group and by 24 units in the placebo group ($P = .001$).

With regard to the SF-12 Health Survey, results indicate better quality of life after treatment with EPs 7630 compared with placebo. For example, more patients receiving EPs 7630 reported that their health was, in general, improved on day seven compared with placebo (61.9% vs 41.4%, $P = .012$), and 32.8% of patients with EPs 7630 had a lot of energy on day seven compared with 25.4% of patients receiving placebo ($P = .187$).

Satisfaction With Treatment

According to the entries of the patient diaries, 51 of 64 patients (79.7%) in the EPs 7630 group and 26 of 60 patients (43.3%) in the placebo group were satisfied with their treatment ($P < .0001$). Only one of 64 patients (1.6%) in the EPs 7630 group and eight of 60 patients (13.3%) in the placebo group were dissatisfied ($P < .0001$).

Tolerability and Safety Evaluation

The tolerability assessments by the investigators and the patients on day seven were similar. A very good or good tolerability was reported by 98.4% of the patients in the EPs 7630 group and by 96.7% of the patients in the placebo group.

A total of 25 of 124 patients (20.2%) experienced at least one AE during the trial: 15 of 64 patients (23.4%) in the EPs 7630 group and 10 of 60 patients (16.7%) in the placebo group, with intensities ranging from mild to moderate. All AEs were assessed

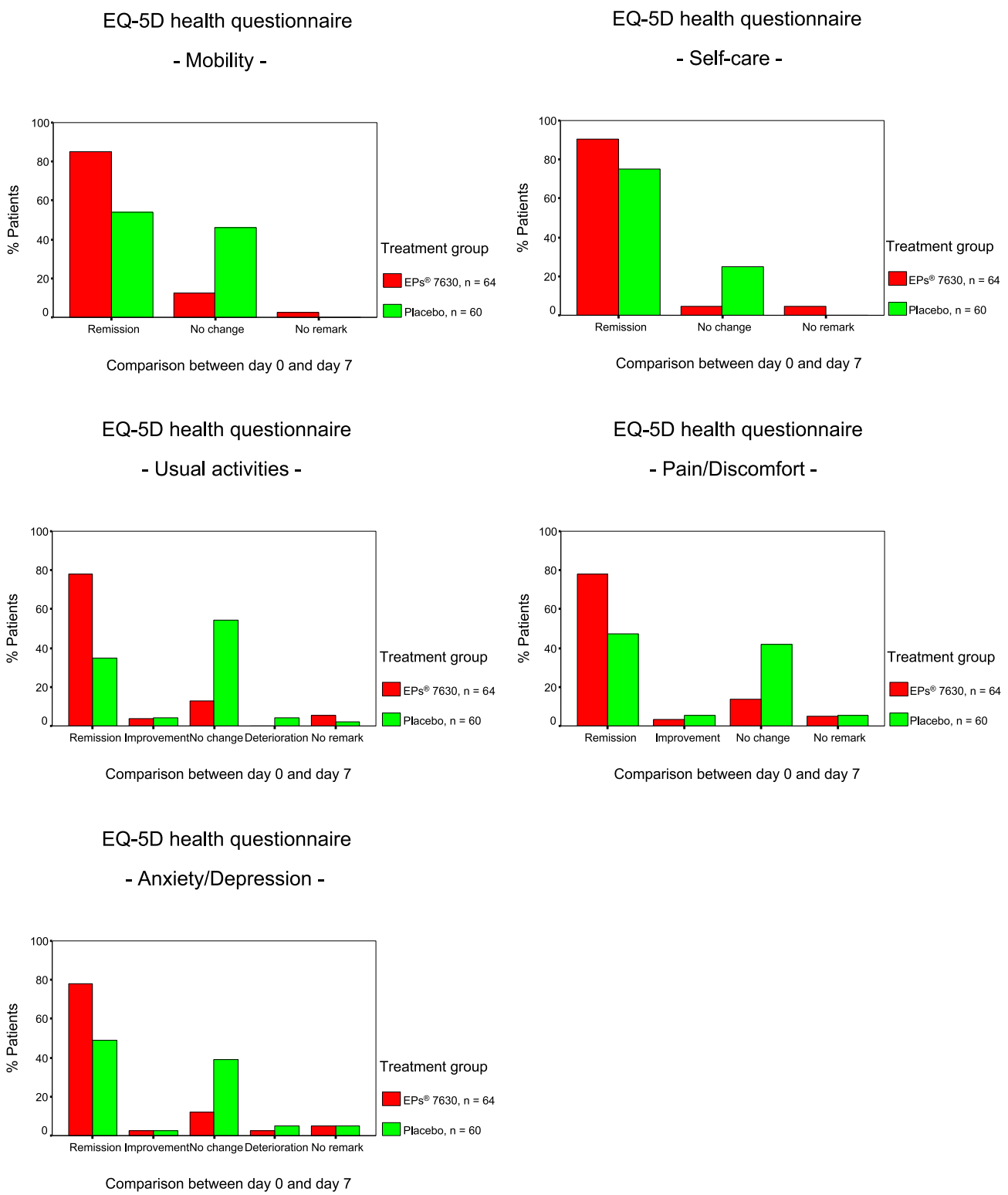


Figure 5. Change of the five dimensions of EQ-5D under EPs 7630 compared with placebo (n = 124, ITT analysis).

as nonserious. Regarding the coagulation parameters Quick and PTT, no differences between the two treatment groups were observed.

DISCUSSION

The results of this trial show that acute bronchitis can be treated successfully with EPs 7630. The clinical relevance of the treatment effects observed is supported by the treatment outcome as assessed by physicians and patients on the Integrative Medicine Outcome Scale. Although only 30% of patients under placebo showed complete recovery or major improvement, nearly 85% of patients receiving EPs 7630 did. Treatment outcome as rated by the patients corresponded closely to the assessments by the investigators.

It is often assumed in antibiotic treatment of acute bronchitis that patient satisfaction with care for acute bronchitis depends mostly on physician-patient communication rather than on antibiotic treatment.[30] Results from patient diaries in this study demonstrate patient satisfaction with treatment. Approximately 80% of patients treated with EPs 7630 compared with only 43% of placebo-treated patients were very satisfied or satisfied with their treatment. In case of EPs 7630, patient satisfaction correlates with the EPs 7630 treatment.

Another important factor for the treatment success of EPs 7630 is the change in health-related quality of life. After seven days, nearly 80% of EPs 7630-treated patients were able to pursue their daily activities again, whereas less than half of the patients receiving placebo could do so. Studies investigating the quality-of-life aspect in the treatment of acute bronchitis are relatively rare. In a trial comparing doxycycline to placebo in the treatment of acute bronchitis, no differences were found between the two groups with regard to general well-being and limitation of activity.[31] Results from a trial comparing cefuroxime axetil with placebo treatment for acute bronchitis[32] show on the one hand similar cure rates at the end of treatment in the two groups and on the other hand better health-related quality of life for patients in the antibiotic group. According to the SF-36 questionnaire, patients treated with antibiotics declared more beneficial changes after eight days than patients in the placebo group, with mean scores of 78.1 and 70.5, respectively ($P = .03$). In another trial comparing azithromycin with vitamin C treatment of acute bronchitis, difference in health-related quality of life was small and not significant.[33] Eighty-nine percent of patients in each treatment group had returned to their usual activities by day seven. It was concluded that azithromycin was no better than low-dose vitamin C for acute bronchitis and that further studies are needed to identify the best treatment for this disorder.

Even though acute bronchitis is a common diagnosis, its definition is still unclear. The diagnosis is based on clinical findings, without standardized diagnostic signs and sensitive or specific confirmatory laboratory tests.[34] Development of generally acknowledged criteria is therefore strongly desirable. The BSS[15] used in this study includes the symptoms rales/rhonchi and dyspnea, which may be looked at differently in countries around the world. In addition, because of the lack in internationally standardized criteria, all outcomes applied in this study are self-report. Also because of this, the development of commonly accepted diagnostic criteria is highly desirable.

EPs 7630 was well tolerated, with no serious AEs during the trial. Several outcomes studies confirm the relatively low number of AEs during treatment with EPs 7630.[35] If one compares the occurrence of AEs during EPs 7630 treatment with antibiotic treatment, the frequency of AEs reported for the use of antibiotics is higher.[6,36] Thus, treatment of acute viral bronchitis, unless caused by bacteria, with antibiotics appears to be relatively ineffective and is furthermore associated with considerable adverse effects. As proposed by Hirschmann,[37] practitioners should explain to their patients that antibiotics will not hasten resolution of their symptoms, which will often respond to other medications.

Taken together, the results of this and those of the formerly published placebo-controlled trials with a total of nearly 800 patients demonstrate the efficacy of EPs 7630 in the treatment of acute bronchitis.[15,35] In comparison, the effect of antibiotic treatment for patients with a clinical diagnosis of acute bronchitis appears to be modest.[7] Moreover, antibiotics have potential adverse effects rates up to 35%[36] but are nevertheless prescribed for 60% to 80% of patients with acute bronchitis.[7] The results of the trials with EPs 7630 offer a convincing argument for an alternative for the treatment of acute bronchitis.[7,38]

In summary, the results of our trial show EPs 7630 to be an efficacious, safe, and well-tolerated herbal medicine in the management of acute bronchitis. It can be considered a reasonable choice for all patients attending general practitioners with this acute condition.

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