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Patient Education and Counseling 66 (2007) 162–166

Patient Education and Counseling

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Prospective determinants of smoking cessation in COPD patients within a high intensity or a brief counseling intervention

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Received 17 August 2006; received in revised form 17 November 2006; accepted 21 November 2006

Abstract

Objectives: The aims of this study were to identify prospective determinants of smoking cessation in COPD patients, and to assess whether prospective determinants vary between two different cessation interventions.
Methods: Two hundred and twenty-five moderate to severe COPD patients were randomly allocated to two smoking cessation interventions. One-year cotinine-validated continuous abstinence rates were 9% for the minimal intervention strategy for lung patients (LMIS) and 19% for the SmokeStopTherapy (SST). The baseline characteristics that showed a significant univariate relationship with 1-year continuous abstinence ($p < .20$) were included in the logistic regression model. This procedure was performed for each intervention separately. Variables that did not remain independent predictors were removed.
Results: For the SST separately, no independent significant predictor remained. For the LMIS, attitude towards smoking cessation (OR: 11.8; 95% CI: 1.7–81.5; $p = .013$) and cotinine level (OR: 2.1; 95% CI: 1.08–3.93; $p = .028$) remained significant predictors. Within the LMIS, 31% of the variance in continuous abstinence was explained by these variables ($p = .003$).
Conclusion: This study suggests that a moderately intensive intervention (LMIS) is primarily suitable for COPD patients with a positive attitude regarding smoking cessation. The more intensive SST can be an alternative for patients without such baseline characteristic.
Practice implications: This stepped-care approach in smoking cessation counseling may be useful in clinical practice and will enable health care providers to match interventions to individual needs and increase efficiency.

Keywords: Predictors; Pulmonary disease; Chronic obstructive; Smoking cessation

1. Introduction

Chronic obstructive pulmonary disease (COPD) is an increasingly serious health problem. The prevalence and incidence of COPD are high. Fletcher and Peto have unequivocally shown that smoking cessation in COPD-patients prolongs life, and postpones invalidity, regardless of the timing of the smoking cessation intervention with regard to the stage of the disease [1]. Furthermore, quality of life will improve when smokers become non-smokers [2]. However, these patients tend to have a long smoking history, a long history of failed quitting attempts, and a very strong nicotine addiction [3,4].

From studies among the general population it is known that the intensity of the intervention is associated with an enhanced likelihood of cessation [5]. Furthermore, Ferguson et al. [6] provided an overview of earlier identified predictors of abstinence from smoking in adults. These factors include gender, age, marital status, education level, nicotine dependence, years of smoking, previous quit attempts, prior smoking abstinence, time spent among smokers, smoking cessation motivation, stage of chance, self-efficacy, social support, depressive symptoms and psychiatric co-morbidity. Only few studies regarding smoking cessation in COPD

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doi:10.1016/j.pec.2006.11.006

patients are available. Baseline characteristics associated with abstinence among COPD patients in particular, have to our knowledge not been thoroughly investigated. Sampablo et al. [7] indicated that patients with no history of previous COPD, a low $FEF_{25–75}$ value and successful smoking cessation after 1 week were predictive factors in smoking cessation with combined therapy with bupropion and nicotine patches, and are likely to remain non-smokers after 1 year follow-up. These results show that there is a void regarding baseline predictive factors in COPD patients.

The first aim of this paper is to identify the baseline characteristics of smoking COPD outpatients predictive of validated continuous abstinence. The second aim is to explore whether these prospective determinants vary between patients receiving two different smoking cessation interventions. This is important for assisting health care providers in selecting patients and choosing between available smoking cessation interventions to improve the (cost-) effectiveness of these interventions offered to COPD outpatients. The theoretical framework of the Attitude-Social Support and Self-efficacy model (ASE model) [8], readiness to quit as based on the stages-of-change algorithm [9,10], disease characteristics, and other factors likely to influence the probability of smoking cessation in the general population, were taken into account as possible predictors of successful quitting in COPD patients.

The purpose of this study was to develop a model to predict continuous abstinence among COPD outpatients receiving two different smoking cessation interventions.

2. Methods

The SMOKE study is a randomized controlled multi-centre trial investigating smoking cessation in COPD outpatients willing to quit smoking. The new SmokeStopTherapy (SST) was compared with an existing Dutch program, the minimal intervention strategy for lung patients (LMIS). The SST consists of group counseling, individual counseling and telephone contacts, supported by the use of Bupropion (Zyban®) free of charge. The total counseling time of the SST is 595 min. The SST provides the possibility to repeat the individual sessions after experiencing a lapse within 3 months. This procedure is called 'recycling'. The LMIS is an existing Dutch intervention that may be considered as current practice for smoking lung patients in the Netherlands, administered in an outpatient setting. This intervention consists of individual counseling and telephone contacts. Pharmacological support is recommended during LMIS counseling, but the use is voluntary and at the patients' costs. The sessions of the LMIS are less intensive and take place at a lower frequency compared to the SST. The total counseling time of the LMIS is 180 min. The validated continuous abstinence rate (using salivary cotinine) 1 year after the start of the intervention was used as the primary outcome measure. Based on this criterion the SST was found to be more effective than the LMIS (continuous abstinence is 19% (SST) versus 9% (LMIS); RR = 2.22; 95% CI: 1.06–4.65).

The ethical committees of all three collaborating hospitals gave their approval of the SMOKE study. Furthermore, informed consent was given prior to randomization by all participants in this study. Both smoking cessation interventions were free of charge which can be seen as a compensation for their voluntary participation in this study. Furthermore, participation in this study induced negligible risks. On the contrary, the benefits of participation included an increased chance of smoking cessation, and as a consequence, an increased chance of improving the prognosis of COPD.

2.1. Sample

A total of 234 smoking COPD patients were included in the SMOKE study. Nine participants were excluded from all analyses because they dropped out after inclusion, but before the baseline measurement at the start of the study. The patients had to have clinically diagnosed moderate COPD (% predicted FEV1 = 50–69) or severe COPD (% predicted FEV1 < 50 as defined by the American Thoracic Society (ATS) criteria [11]. Participants were included only if they were aged between 40 and 75 years, and if they had a good knowledge and understanding of the Dutch language. Willingness to participate in a smoking cessation program was also an eligibility requirement. The only exclusion criterion was a counter indication for the use of Zyban. This criterion largely eliminated the risk involved in participating in this study.

Eligible patients were randomly allocated to the SmokeStopTherapy (SST) or the minimal intervention strategy for lung patients (LMIS). The LMIS group differed significantly from the SST group only with regard to age, nicotine addiction and dependence, use of NRT, and use of Zyban (Table 1). However, within this manuscript smokers and non-smokers are compared within the LMIS and the SST separately and the outcomes of this study are independent of the randomization procedure.

2.2. Measurements

Measurements took place at baseline, 6 and 12 months. The following questionnaires were used: the smoking related questionnaire from Mudde et al. [12], the Fagerström Test for Nicotine Dependence (FTND) [13], Beck's Depression Inventory (BDI) [14] and the St. George Respiratory Questionnaire (SGRQ) [15]. Lung function was measured by spirometry from which the following parameters were extracted: inspiratory vital capacity (IVC), forced expiratory volume in second FEV1/IVC percentage predicted forced expiratory volume in 1 s (FEV1%predicted). A saliva sample was collected for cotinine assessment. And finally, smoking status was determined at 6 and 12 months after the start of the intervention, and validated continuous abstinence was defined