

ORIGINAL ARTICLE

Pragmatic, observational study of bupropion treatment for smoking cessation in general practice

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Background: Cigarette smoking remains the single largest cause of premature death in the United Kingdom. As part of the government's national service framework for coronary heart disease, smoking cessation forms a key part of the strategy.

Objectives: To determine the effectiveness of bupropion treatment for smoking cessation in a general practice setting, measuring continuous abstinence from smoking, from 8 weeks to 52 weeks.

Design: Prospective observational study.

Setting: One general practice (six whole time equivalent doctors, 11 070 patients) in rural Northumberland.

Subjects: Of the 243 patients who presented to the practice over a one year period for smoking cessation, a total of 227 motivated people, who were appropriate for bupropion treatment as a pharmacological aid for smoking cessation, entered the study. Continuous smoking cessation at one year was validated by an exhaled carbon monoxide level of 10 ppm or less.

Results: Fifty patients successfully gave up smoking, giving a one year smoking cessation prevalence with bupropion of 22% (95% confidence intervals (CI) 17% to 28%). There was no difference in success rate for sex, number of cigarettes smoked, the number of years smoking, or whether there were other smokers in the household or not.

Conclusion: Bupropion treatment in this general practice helped 22% of motivated people to quit and remain stopped smoking at one year. Mainly nurses, whose prescribing rights are restricted and currently exclude bupropion, deliver smoking cessation services in primary care.

Cigarette smoking remains the single largest cause of premature disability and death in the United Kingdom. The cost to the NHS is about £1500 million per year.¹ In 1998 the UK government white paper on tobacco, Smoking Kills,² suggested £60 million would be spent over a three year period to set up smoking cessation services.

In June 2000, bupropion was licensed, to help people to stop smoking in conjunction with motivational support. Bupropion is a non-nicotine based treatment that has been shown in two randomised, placebo controlled, double blind trials in the USA to be effective in helping smokers to stop with success rates between 23% and 30% at one year. This relates to the licensed dose of 300 mg of bupropion daily for eight weeks together with professional follow up and support.^{3,4} The National Service Framework (NSF) for Coronary Heart Disease,⁵ and the development of smoking cessation specialists,² together with an extensive media campaign launch of bupropion provoked a need for primary care to integrate pharmacological and non-pharmacological support for people who wanted to stop smoking.

Smoking cessation rates sustained at one year are about 5% for brief advice alone,^{6–8} up to 20% with counselling coupled with nicotine replacement therapy (NRT),^{6–9} and 20%–35% with bupropion.^{3,4,10–12}

Our aim was to determine the effectiveness of bupropion for smoking cessation in a general practice setting, measuring continuous abstinence from smoking, from 8 to 52 weeks.

METHOD

Setting

This study took place in one general practice (six whole time equivalent doctors) in rural Northumberland, with a list size of about 11 070 patients. Four practice nurses were trained in

smoking cessation techniques. They offered support and pharmaceutical advice for the practice population.

Subjects

Patients between the ages of 18 to 75 years who presented to health care professionals for smoking cessation were included in the study. Exclusion criteria included a history of head injury, pregnancy, predisposition to seizures, current diagnosis or a history of anorexia nervosa or bulimia, liver cirrhosis, alcohol dependency, history of bupropion use within one year, a history of significant depression, bipolar disorder, or insulin dependant diabetes. Each patient was assessed on their motivation to stop smoking using the cycle of change.¹³ Those patients who showed they were at the "action" stage entered the study.

Design

A prospective observational study design was chosen. Patients presented to the smoking cessation specialist nurse either by self referral or via their GP over a one year period. Patients not eligible for bupropion treatment were offered alternative smoking cessation support, for example, NRT. Upon entry into the study, baseline information was obtained on age, sex, number of cigarettes smoked per day, number of years smoking, number of previous attempts to give up smoking, any previous use of NRT, any other smokers in the household, any history of concomitant disease, and measurement of the first exhaled carbon monoxide (CO) level. Bupropion, 150 mg daily was taken for the first seven days and then 150 mg twice daily for the remainder of the eight week treatment period. Follow up appointments with the

Abbreviations: CO, carbon monoxide; NRT, nicotine replacement therapy

Table 1 Distribution of concomitant disease

	Number of patients (%)
No concomitant disease	171 (75)
Asthma	18 (8)
Diabetes	10 (4)
Hypertension	9 (4)
Chronic obstructive pulmonary disease	6 (3)
Myocardial infarction/angina/coronary artery bypass graft	5 (2)
Peripheral vascular disease	4 (2)
Other	4 (2)

practice nurse occurred at 2, 4, 8, 26, and 52 weeks, each lasting 20 minutes and offering supportive advice and literature. Each visit recorded side effects, reasons for failing, and a CO level. CO levels of 10 ppm or less validated abstinence from smoking. Failure to attend follow up was recorded as failed smoking cessation.

Outcome measures

The main outcome measure was continuous abstinence from smoking, from 8 weeks to 52 weeks. To achieve this, patients required a negative CO level at each follow up appointment.

Analysis

Data were analysed using Epi-info,¹⁴ and Minitab. Descriptive statistics were examined with comparison of dichotomous variables using χ^2 with Yates's correction. A two sample *t* test was applied where appropriate and a *p* value less than 0.05 was considered significant.

RESULTS

During the one year study period a total of 243 patients attended our practice for smoking cessation help. Five patients were unsuitable for bupropion treatment, as they were not at the "action" stage.¹³ Two patients had contraindications to bupropion treatment, two patients refused bupropion treatment, and seven patients specifically requested NRT in the form of patches. A total of 227 patients entered into the study for evaluation of bupropion treatment. The mean age of the patients was 43 years (SD 12 years). Forty seven per cent of patients presenting were men. The mean number of cigarettes smoked per day was 22 (SD 8) of which 19% were light smokers (less than 15 cigarettes per day). The mean number of years smoked was 26 years (SD 11). There were a median number of three (range 0–8) attempts at giving up smoking with 60% of patients having previously tried to stop with NRT. Of all smokers in the study 37% had one or more smokers living in their household. Twenty five per cent of patients had concomitant disease (table 1).

Fifty (22%, 95% CI, 17% to 28%) patients were non-smokers at 52 weeks confirmed with CO validation (table 2).

Of those who failed to give up smoking, 132 (58%) gave no reason, 36 (16%) cited stress, 18 (8%) cited side effects, 6

Table 3 Distribution of side effects experienced with bupropion

Side effect	Number (%)
None	141 (62)
Insomnia	43 (19)
Headache	10 (4)
Dry mouth	5 (2)
Dizziness	5 (2)
Nausea	5 (2)
Other	18 (8)

(3%) cited depression, 5 (2%) cited weight gain, 29 (13%) gave another reason. Table 3 shows the distribution of side effects experienced by the study population.

Patients who were smokers for more than 25 years and hence in the older age groups were more likely to give up smoking although this did not reach significance (fig 1) (19 of 115 smokers ≤ 25 years compared with 31 of 112 smokers > 25 years; $\chi^2 = 3.5$; *p* = 0.06; 95% CI, 0.26 to 1.03). The mean age for those who had successful smoking cessation at one year was 46.3 years (SD 11.9) compared with 42.5 years (SD 11.9) for those who failed (mean difference 3.77 years; 95% CI, -0.02 to 7.56; *p* = 0.05). There was no difference in smoking cessation success when comparing men and women respectively (25 of 106 men compared with 25 of 121 women; $\chi^2 = 0.14$; *p* = 0.71; 95% CI, 0.43 to 1.66). Success was not predicted by the presence of concomitant disease (9 of 56 compared with 41 of 171; $\chi^2 = 1.11$; *p* = 0.29; 95% CI, 0.24 to 1.40), the number of cigarettes smoked (31 of 138 smoking ≤ 20 cigarettes/day compared with 19 of 90 smoking > 20 /day; $\chi^2 = 0.01$; *p* = 0.94, 95% CI, 0.54 to 2.20), or whether there were other smokers within the household (16 of 84 with smokers in the household compared with 34 of 143 with no smokers in the household; $\chi^2 = 0.44$; *p* = 0.51; 95% CI, 0.36 to 1.53).

DISCUSSION

Main findings

Continuous verified smoking abstinence from 8 weeks to 52 weeks was 22% (95% CI, 17% to 28%). Success or failure was not predicted by sex, number of cigarettes smoked per day, number of years smoking, the presence of concomitant disease, or if there were other smokers in the household.

Strengths and weakness of the study

This was a pragmatic study carried out in a busy general practice that has informed the smoking cessation strategy of our practice. The frequency and length of nurse appointments to deliver this service were both realistic and achievable. Our 22% success rate at one year must be viewed cautiously given that there were no comparison groups. Hence there was no evaluation of the direct effect that the four nurse consultations had over the one year study period.

Comparison with other literature

Bupropion was well tolerated by two thirds of the participants, with insomnia cited as the most frequent side effect followed by headache, dry mouth, dizziness, and nausea, which concur with the product datasheet. None of the 227 participants who received bupropion suffered a seizure or any other serious side effect. Two large European double blind randomised placebo controlled trials of 300 mg bupropion daily for eight weeks showed a six month quit rate of 31% compared with 16% placebo (odds ratio 2.3, 95% CL 1.4 to 3.7),¹² and a one year quit rate of 21% compared with 11%

Table 2 Carbon monoxide validated smoking cessation at follow up (n = 227)

Follow up (weeks)	Number (%)
4	130 (57)
8	98 (43)
26	64 (28)
52	50 (22)

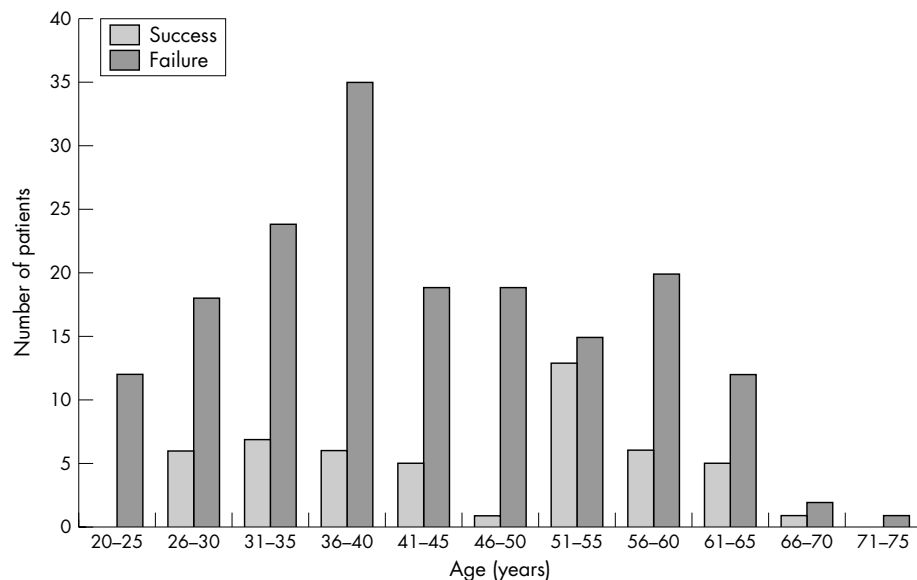


Figure 1 Age distribution of successful smoking cessation at 52 weeks.

placebo (odds ratio 2.2, 95 CL 1.3 to 3.8).¹¹ A large randomised trial in the USA of 150 mg to 300 mg of bupropion daily for eight weeks showed one year quit rates of 24% to 33% respectively.¹⁰ A review of the evidence of effectiveness of bupropion treatment for smoking cessation in general practice found a six month point prevalent smoking cessation rate ranging from 25% to 49%.¹⁵ These data are comparable with our data from real life general practice. A systematic review of NRT and bupropion found both interventions effective for smoking cessation, however their relative effectiveness remains in doubt.¹⁶

Implications for practice

Despite an apparent increased efficacy of bupropion over NRT, NRT continues to be prescribed more than 10 times more often than bupropion.¹⁷ This may be because of the more favourable safety profile of NRT over bupropion.¹⁶ The demand for bupropion has decreased since its launch, probably because of media reports of the adverse effects of bupropion and NRT being available on prescription in the form of transdermal patches, chewing gum, and lozenges. Bupropion has been shown to be a successful aid for smoking cessation,^{3 4 10-12} and this study shows that bupropion treatment in a busy general practice setting may improve the one year smoking cessation rates by up to 22% and has informed the smoking cessation strategy of our practice. Currently, smoking cessation nurse specialists have limited prescribing rights and are unable to prescribe bupropion. Although this study may not be generalisable, a 22% success rate at one year would equate to 45 000 quitters per year in the UK extrapolated from NHS statistics.¹⁷ Bupropion, where appropriate should be part of an overall smoking cessation strategy in primary care.¹⁸

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CONTRIBUTORS

SW and AE were responsible for the study design. AE, MH, and JG recruited patients to the study and collected study data. SW, AE, MH, and JG contributed to the data analysis and writing of the paper. SW acts as guarantor of the study and accepts full responsibility for the conduct of the study, data access, and controlled the decision to publish.

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