Abstract  Rationale: With several different forms of nicotine replacement therapy available for smokers, it is useful to know about factors that may influence choice of form. Objective: To examine factors associated with preference for different nicotine replacement products and effectiveness of these products. The simple comparison of success rates between the products has been reported previously. Methods: Five hundred and four smokers were invited to rank order four products (gum, patch, nasal spray and inhaler) in terms of preference and were then randomly allocated to receive one of the products for a smoking cessation attempt. They were followed up 1 week, 4 weeks, 12 weeks and 15 weeks later. Ratings of the products were repeated 1 week after the quit date. Mood and physical symptoms were assessed at baseline and at each follow-up visit. Urges to smoke were assessed at all post-quit date sessions. Abstinence was assessed by self-report with expired air carbon monoxide verification. Results: The patch was the most popular product initially, followed by the spray and inhaler and then the gum. The difference was greater for women than men. However, all smokers quickly came to like whichever product they had been allocated. Smokers who initially preferred the spray or inhaler were heavier smokers than those who preferred the gum or patch. Prior experience of the gum was associated with lower initial preference for it, but did not affect outcome. Prior experience with the patch had no effect on preference or outcome. Being allocated to the preferred product did not increase success at stopping smoking. Women were more successful at stopping smoking on the inhaler than the gum. Among highly dependent smokers, those on the inhaler had a lower relapse rate than those on the other products. Conclusions: Regardless of initial preferences, whether patients obtain their preferred form of NRT or one selected for them did not seem to affect outcome. This may be because smokers came to like particular products as they got used to them. Other things being equal, women may be better advised to use inhaler rather than gum and men vice versa.

Keywords  Nicotine replacement · Smoking cessation · Individual difference

Introduction

At the time of writing there are six types of nicotine replacement treatment (NRT) on the market, i.e. chewing gum, skin patch, nasal spray, inhaler, sublingual tablet and lozenge. All have been shown effective in comparison with placebo (Sutherland et al. 1992; Tonnessen et al. 1993; Silagy et al. 2000). We have reported results of a study of four of the products (excluding the sublingual tablet and lozenge) showing that success rates on four of the products the products are broadly similar (Hajek et al. 1999). The present paper reports data from the same study examining factors associated with preference for different forms of NRT and also whether different groups of smoker differ in their response to different forms of NRT. Such investigation is important for clinicians attempting to find the best match between product and smoker.

There are few data currently available on these issues. In studies in which subjects were randomised to one or the other NRT product, the sample size or study design did not allow patient subgroups to be studied (e.g. Fagerstrom et al. 1993; Leischow et al. 1997). In an experiment looking at patient preferences in a context of smok-
ing reduction, subjects reduced their smoking over a 2-week period more when using NRT products they chose than when using those selected for them randomly (Fagerstrom et al. 1997).

The present study addressed the following specific research questions:

1. Having received information on all four types of NRT, which do smokers most prefer? The patch appears to be the most widely purchased, at least in the UK (unpublished sales data). However, it is not clear whether this would hold true when smokers are provided with standardised information about the products at the time when the choice is made.

2. Is preference for particular NRT types related to smoker characteristics? One might expect demographic and personality characteristics to influence preference for products, but evidence on this issue is lacking. Thus women and older smokers may be expected to dislike the gum more than men because of the image. More introverted smokers may prefer products such as the patch that are more discreet.

3. Is preference for a particular type of NRT related to prior experience of NRT? One might expect that smokers who have used a particular product before without success would prefer not to use that product again.

4. How does preference for NRT types change during a quit attempt using a particular form of NRT? When smokers begin to use a product their experiences may differ from their expectation.

5. If smokers are given an NRT type that is their first choice, does this improve their usage of NRT and their chances of success at stopping smoking? Conversely, one might expect that giving smokers a form of NRT that is not their preferred option would adversely affect their utilisation and success with the product.

6. Do some types of smoker benefit more from one type of NRT rather than another? It has been argued that smokers who feel a greater need for something to do with their hands would benefit more from the inhaler or that more dependent smokers may benefit more from the nasal spray. However, data on this are lacking.

Methods and methods

Sample

This study was performed at two sites in London, UK (Royal London Hospital and St George’s Hospital). It involved random assignment of smokers to four groups, receiving gum, patch, nasal spray or inhaler (Hajek et al., 1999). Recruitment was conducted through advertisements and referrals by general practitioners. A total of 506 smokers met the study criteria and underwent randomisation. Two became pregnant during the study and their participation was discontinued, leaving 504 subjects.

The subjects were eligible for inclusion if they were at least 18 years old, had smoked an average of ten or more cigarettes per day, were motivated to stop smoking, were generally in good health, were not currently receiving treatment for a psychiatric disorder, had not tried to stop smoking using NRT within the past 3 months, and for whom none of the four NRT products was contraindicated. There were 35% men, 56% were married or living with a partner, 59% were in paid employment, 44% were in or had been in a white collar job, mean age was 40 years (SD=10), mean cigarette consumption was 25 cigarettes per day (SD=9), mean expired CO level was 29 ppm (SD=12), and the average number of previous serious quit attempts was 3 (SD=3). There were no significant differences between the groups.

Procedure

After initial screening via a telephone interview, smokers that fulfilled the entry criteria were sent a postal questionnaire and information that they should smoke normally up to the first session which would be their “quit day”. At their first individual attendance at the clinic (week 0), smokers viewed an 8-min video describing the four NRT products being tested, and provided ratings of their opinion of the products. The video was specially developed for the study and used a common format to describe each of the products. Each product was demonstrated and its mode of operation, use and side-effects briefly described. The participants were then randomised, by a computer-generated schedule in sealed envelopes, to receive one of four NRT products as follows: (1) nicotine gum – 2 mg or 4 mg (n=127) (subjects using 12 or more pieces of 2 mg gum per day were offered 4 mg gum. This applied to four subjects); (2) nicotine transdermal patch – 15 mg, 16-h (n=124); (3) nicotine nasal spray (n=126); and (4) nicotine inhaler (n=127). The subjects agreed to take part in the study knowing that they might be allocated to any one of these products. They were also aware that they would have to purchase the products at approximately half the normal retail price, 1 week's supply at a time (£7, i.e. $12, for 105 pieces of gum, seven patches, one bottle of nasal spray solution giving two hundred 0.5 mg doses or 42 inhaler cartridges). The reason for this was to mimic as far as possible the conditions in countries where NRT is not currently reimbursable.

The subjects then viewed a 7-min, specially prepared video describing in greater detail how to use the product to which they had been assigned and what to expect from it in terms of effects and side-effects. The purpose of the videos was to standardise presentation of information about the NRT products as far as possible. After viewing the video on their product, the subjects rated their mood and physical symptoms to provide a baseline for later measurements of withdrawal symptoms.

The subjects tried one unit of their NRT product at the first session under the supervision of the researcher and then were dispensed their supply of NRT to last them for 1 week. Subjects were given brief encouragement to remain abstinent and were instructed to use the NRT product to which they had been assigned according to the manufacturer’s instructions for up to 12 weeks. For gum, this involved at least 10–15 pieces per day approximately hourly; for the patch this involved one patch per day applied to the skin on waking; for the nasal spray this involved at least 30 single shots per day approximately hourly; for the inhaler this involved using the inhaler hourly for some 20 min and using at least six cartridges per day with each cartridge being used 3–4 times. Subjects were also given a sheet containing written guidance on use of their product.

Subsequent individual visits to the clinic were scheduled as shown in Table 1. Subjects received £10 expenses per visit, excluding session 1.

The following measures were taken:

1. Demographic and smoking variables, including Fagerstrom test for Nicotine Dependence (FTND; Heatherton et al. 1991) and prior usage of NRT – postal questionnaire.

2. Extraversion, neuroticism and conscientiousness by means of the NEO Questionnaire (see Fisher et al. 1998) – session 1.

3. The four products were ranked in order of preference (1=most preferred, 4=least preferred) in the first session, after the video describing all four and before allocation, and in the session after 1 week of use – sessions 1 and 2.

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