

Expert Opinion

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Monthly Focus: Pharmacoeconomics

Economic rewarding of smoking cessation-facilitating drugs – a comparison of over-the-counter and prescribed nicotine replacement therapy

Tibor Baška[†], Štefan Straka, Martina Bašková & Rastislav Mad'ar
[†]Institute of Epidemiology, JFM CU, Sklabinská 26, 037 53 Martin, Slovak Republic

Smoking cessation represents a very difficult task for the smoker, often requiring medical assistance. The introduction of smoking cessation drugs has been crucial to this process. Currently, there are two standardly used treatments: nicotine replacement therapy (NRT) and the antidepressant bupropion. Soon after their introduction, NRTs were sold over-the-counter (OTC), as oppose to on prescription, although in most countries, bupropion remains available only on prescription. Both prescribed and OTC NRTs have similar efficacy (i.e., their use approximately doubles the cessation rate among users and their use has shown a high level of economic rewarding). The most important advantage of OTC NRT is availability, as some patients may not be comfortable with the use of prescribed drugs. The introduction of OTC NRT has led to a substantial rise in their use, increasing the proportion of ex-smokers in the population. However, there are a lack of published, cost-benefit analysis data comparing prescription with OTC NRT. Considering the different economic, social and cultural conditions within particular countries, it is difficult to formulate a common optimal economic model for the distribution of NRT. Authentic studies and trials in this field in order to develop the appropriate policies in each particular country, are clearly required.

Keywords: cost-benefit, cost-effectiveness, nicotine replacement therapy, over-the-counter, prescription

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1. Introduction

According to the World Health Organization (WHO), smoking is the most important preventable risk factor in developed countries [32]. Apart from the primary prevention of smoking itself, decreasing the impact of smoking on health is considered a secondary prevention (i.e., smoking cessation). A crucial contribution to smoking cessation is the introduction of several therapies to facilitate the cessation process. There is numerous scientific evidence showing the efficacy and safety of nicotine replacement therapy (NRT) as well as the antidepressant, bupropion [17]. These two types of drugs have been included in the current guidelines and are recommended as a standard part of smoking cessation [8,36,100]. Their use significantly increased during the 1990s, which was documented in a US population survey [22]. In most countries, bupropion still remains a prescription drug, due to the need to monitor contraindications and adverse effects, compared with NRT [7]. Initially, NRT was only available only on prescription. Presently, patches and gums are available over-the-counter (OTC) without prescription, although the nasal spray and inhaler are still distributed as prescription drugs [12].

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The main objective of this article is to review the available scientific data on OTC NRT efficacy, to compare this against prescribed NRT, and look at the cost-benefits of OTC NRT.

2. Goals of therapy and available compounds

The main goals of the therapeutic agents used in smoking cessation are to alleviate the unpleasant withdrawal symptoms and reduce the possibility of relapse (i.e., increase the probability of long-term abstinence). Two groups of pharmacological agents are currently available [8,36,100]:

- **NRT:** releases nicotine into the bloodstream, which eases the effect of withdrawal symptoms. NRT can be used in the following applications: patches for transdermal application, chewing gums (acting through bucal mucosa), nasal spray (acting through nasal mucosa) and inhalator (acting through pharyngeal and bronchial mucosa).
- **Sustained-release bupropion:** originally used as an antidepressant, as it increases the levels of dopamine, which is decreased in smokers. It also helps to reduce withdrawal symptoms, thus increasing the cessation rate.

As a potential mutual effect with NRT and bupropion has been found, resulting in a higher cessation rate, current guidelines recommend the combination of these two drugs, unless contraindications are observed.

3. Current best practice

In order to review the scientific information on the economic aspects of prescribed and OTC NRT, all the relevant, available published scientific data was retrieved. From the data reviewed, conclusions and suggestions for further research and practice were then drawn.

3.1 Material and methods

For information retrieval, Medline, the ACP Journal Club (ACP), Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews (CDSR) and Database of Abstracts of Reviews of Effects (DARE) via Ovid Online System were used [101]. The following combination of keywords was used: (smoking cessation + prescription) or (smoking cessation + over-the-counter). A total of 145 references were retrieved in this search. Concurrently, a MeSH (Medical Subject Heading) search was conducted using the combination of: smoking cessation + cost-benefit analysis as keywords. A total of 112 references were found through this search. The information resources have been closed from January 26, 2004. Articles dealing with the effectiveness (represented by cessation rate or social benefit) and/or the economic analysis (represented by cost-effectiveness or cost-benefit analysis) of the use of NRT published since 1996 onwards, were included. Repeated references, Editorials, Letters to the Editor and papers not meeting the mentioned criteria for this review

were omitted. This left a total of 31 references which have been selected for this review.

3.2 Results

With regard to prescribed NRT, its effects have been well documented [17,28] and their beneficial influence on cessation rates, as well as a high level of economic rewarding has been proved [2,3,5,9,12,30,35]. NRT therapy alone increases the cessation rate approximately by a factor of two, which after 1-year of therapy, gives a cessation rate of 5 – 30%. However, there is little direct evidence that one NRT product is more effective than another [17].

After the introduction OTC NRT products, a substantial increase in their use was documented in several reports. Nicotine patches and nicotine gum use increased by 78 – 92% and 180%, respectively [16]. In the US, this represented 114,000 – 304,000 extra smokers quitting annually [26], resulting in 450,000 additional ex-smokers within 10 years [21]. Economic analyses, taking into consideration the QALYs (quality-adjusted life years) saved in the US population, clearly showed social benefits resulting from OTC NRT sales [16,18]. However, one study of African-Americans did not show such a positive trend. Consumption after switching from prescription to OTC NRT sales significantly decreased and attention is drawn to other NRT use barriers, apart from physician visits, especially among minority smokers [33].

Cessation rates after the introduction of OTC NRT patches ranged from 8.2 to 21% after a 6-month, follow-up period [6,11,15,25]. One trial assessing the cessation rate with both OTC NRT gum and patches found only a slight difference in the cessation rate after 6 months (8.4 and 9.2%, respectively) [25]. A meta-analysis of seven previously conducted trials showed a combined cessation rate of 7% using OTC NRT (both patches and gums), although it did not find a significant difference between the efficacy of prescribed and OTC NRT [13]. The proportion of patients successfully quitting smoking depends, besides other factors, in particular, on their own motivation [12] and level of nicotine dependence, represented by the Fagerström score [5]. Although the absolute number of quitters varies considerably and generally does not reach efficacy seen in cessation programmes including behavioural therapy, in controlled trials, smokers using OTC NRT consistently reach approximately twice the quit rate of those administered placebo [6,11-14,24], which is similar that in trials studying prescribed NRT [5,9,10,27]. From this aspect, the effect of NRTs is not dependent on additional behavioural therapy [14,24,28]. In one trial, NRT patches showed higher quit rates with OTC NRT than prescribed NRTs, although with the use of nicotine gum, such differences have not been found [25].

When payment for NRT was considered, there were no significant differences in the cessation rate between those patients who paid for the NRT themselves or those who gained the NRT free of charge [11]. A study carried out in the UK compared several models of cessation payment by health

insurance companies. They found that the highest cessation rate (obtained from the numbers of participating smokers) was achieved in those with full coverage for NRT and partial coverage for additional therapy; however, even though full coverage (both for NRT and behavioural therapy) gave lower cessation rates, it did attract substantially larger numbers of smokers, resulting in the largest possible number of quitters in the community [4].

The role of pharmacists in counselling has been clearly proven in the study by Crealey *et al.* [1], where the behavioural intervention, PAS (Pharmacist Action on Smoking), enhanced by NRT patches showed high cost-effectiveness. The addition of PAS also gave several times higher cessation rates after 6 months than with NRT patches alone (46 versus 6%, respectively).

Contrary to promising data from analytical studies and clinical trials, data from a public survey in the US showed that from 1996 to 1999 (i.e., after the introduction of OTC distribution of NRT), there was a decrease in the efficacy of NRT. In 1999, the difference in cessation rates between users of pharmaceutical aids and non-users remained significant (in moderate and heavy smokers) only during the first 3 months after smoking cessation, whereas in earlier surveys it remained significant even after 1 year [22].

3.3 Discussion

There are only a few studies that have directly dealt with the economic analysis of the use of OTC NRT [4,16,18,23,29] and not a single study comparing the cost-benefit of prescribed and OTC NRT. However, it has been well documented [2,3,10,19,20,27,30,34,35] that there is a high level of cost-effectiveness when prescribed NRT are used alone and clear economic rewarding is consistently expressed compared with other preventive measures. Taking into consideration that the effectiveness of the NRT, both on prescription and OTC, is almost identical (i.e., the use of NRT approximately doubled the quit rate), it can be concluded that OTC NRT could be also cost-effective. Furthermore, OTC distribution leads to a substantial increase of the number of users, thus resulting in a larger proportion of quitters within the population. Although the efficacy of OTC NRT (represented by the cessation rate) is lower than with other approaches – including intensive intervention – one must bear in mind that an increase of intensive programmes leads to an increase in both the cost and the efficacy. Although generally, the cost increases more rapidly than the efficacy, the most effective programmes therefore, may not be the most cost-effective [34].

On the other hand, a recently published public survey observed that the efficacy of pharmaceutical aids used in clinical trials may not extend to real life [22], thus highlighting possible barriers, which can prevent the appropriate use of NRT in nonclinical conditions.

However, the question of financing for NRT remains open. It can be assumed that the involvement of the smoker in the payment of drugs can enhance their motivation, thus increasing

the probability of success; however, recent findings did not show this [4,11]. However, the attractiveness of a particular NRT product can be influenced by factors other than reluctance to visit a physician in order to obtain the drug. As the study by Thorndike *et al.* [33] showed, OTC distribution can decrease the use of NRT among minorities in the developed country, probably due to economic reasons. The same situation can also be seen in both developing and transforming countries of Central and Eastern Europe (CEE), where the price of NRT is extremely high for a considerable proportion of the population. As mentioned previously, full coverage of cessation therapy by health insurance companies can significantly increase the number of quitters in a population [4], indicating that physician prescription of NRT could have a positive impact on the health of the population.

Faced with the progressive increased use of OTC NRT, the main role of physicians is more involved in enhancing the motivation of the smoker to quit. Coupled with the fact that many smokers fail in their first cessation attempt and may be discouraged, physicians should remind them that it takes most smokers several attempts before they achieve success [12]. In such conditions, pharmacists can play an important role in the counselling of clients [1]. In order to effectively educate the general population about the problems of smoking cessation, information campaigns as well as appropriate knowledge of health providers, namely physicians, nurses and pharmacists, are needed.

4. Conclusions

Considering the comparable efficacy of NRT, both on prescription and OTC, as well as the increased availability of OTC NRT, it can be concluded that OTC NRT has a high impact on the secondary prevention of smoking on the population level. Taking into account available scientific data, OTC NRT is also financially rewarding. However, attention should be paid to the appropriate use of OTC NRT and its efficacy in nonclinical conditions.

Prescribed NRT, particularly as a part of complex cessation programmes, still remains an important tool in tobacco control activities. Although the optimal model of health insurance involvement regarding the payment of NRT has not been developed, partial NRT payment coverage could be beneficial, especially among those in minority groups and lower socioeconomic classes.

5. Expert opinion

According to recent published data, both prescribed and OTC NRT are effective, and their economic advantages have been proven.

Considering the involvement of health insurance providers in cessation therapy, it would be beneficial to cover NRT as a part of a complex cessation programme (behavioural therapy) to ensure sufficient motivation and to prevent excessive

prescriptions among those patients not indicated [4]. Paying for OTC NRT by a smoker can itself represent financial motivation. Health providers, particularly pharmacists, should appropriately describe the essence of NRT and its indications, as well as inform that drug itself is not a solution and motivation is vital in the cessation process [1].

Considering the different economic, social and cultural conditions in particular countries and regions, it is difficult

to formulate a common optimal economic model for the distribution of NRT [34]. It calls for authentic studies and trials in this field, in order to obtain the appropriate policies for each particular country. From this aspect the transforming countries of the CEE, as are the future members of the European Union, are particularly important here as their public health priorities should be adjusted appropriately in line with the changing economic and social situation.

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Affiliation

Tibor Baška MD, PhD[†],
 Štefan Straka MD, PhD, DSc,
 Martina Bašková MN, PhD &
 Rastislav Mad'ar MD, PhD
[†]Author for correspondence
 Institute of Epidemiology, JFM CU,
 Sklabinská 26, 037 53 Martin, Slovak Republic
 Tel: +421 43 4134715;
 E-mail: baska@jfm.uniba.sk