Patient education about cough: effect on the consulting behaviour of general practice patients

GUY RUTTEN

JACQUES VAN EIJK

MECHTILD BEEK

HENK VAN DER VELDEN

SUMMARY. The aim of this general practice study was to examine how the consulting behaviour of patients with a cough was affected when the tasks and responsibilities of patients, practice nurses and general practitioners were reorganized. In four 'average' single-handed general practices the effects on the consulting behaviour of patients of a rational practice policy on cough and the provision of systematic patient education on cough were compared with patient behaviour in four matched control practices. Changes of behaviour were measured in 548 patients who consulted for cough at least twice, in two successive autumn-winter periods. Significantly more patients in the experimental practices changed their behaviour to follow the practice guidelines than did patients in the control practices (56% versus 30%, P<0.001). The proportion of patients who continued to consult in the approved manner was greater among patients receiving intervention (66% versus 29%, P<0.001). This was equally true for patients who had suffered less than four episodes of cough or more than four episodes. The more often the patients received the education, the more effective it was. All patients who consulted the general practitioner for cough during the first autumn-winter period filled in a cough diary during the second period. From this it appeared that the intervention did not result in patients delaying consultation when they had a cough lasting longer than three weeks or one with 'serious' symptoms.

It would appear that a rational practice policy and the provision of patient education can stimulate patients to modify their consulting behaviour. This could result in a reduction in the costs of health care.

Introduction

COUGH is one of the most frequent symptoms with which people consult their general practitioner.[1] In many cases, however, consultation is unnecessary.[2] Educating patients about cough could reduce the number of unnecessary consultations and training practice nurses could enable them to handle many cough symptoms independently, providing the general practitioner with more time for other activities. If in addition fewer unnecessary drugs were prescribed, patients' dependence on medical provisions would be reduced.

J Van Eijk, PhD, professor, Department of General Practice, Free University of Amsterdam, The Netherlands. G Rutten, MD, general practitioner; M Beek, MD, behavioural scientist; H Van Der Velden, MD, professor, Department of General Practice, University of Nijmegen, The Netherlands.

Submitted: 2 July 1990; accepted: 28 November 1990.

Several attempts have been made to influence the self care and consulting behaviour of patients suffering from a cough. Cards giving information about coughs and colds can be provided in place of a prescription; if the cards are designed to be kept, a family can make use of them when required.[3] Using clinical algorithms for acute medical complaints medical assistants were able to evaluate and treat 21% of patients with a cough.[4] In a randomized controlled trial a symptom-based algorithm for respiratory tract symptoms, coupled with a health care programme, was found to reduce significantly the number of 'unnecessary' visits while there was a non-significant decrease in the number of 'necessary' visits.[5] It has also been shown that a self-care centre can be effective.[6,7] Two studies,[8,9] based on the widely distributed book *Take care of yourself*,[10] showed that the effects of patient education will be poor if the algorithms are highly sensitive but have a low specificity. The algorithms should be strongly oriented towards home treatment or be supplemented by personal reinforcement of the instructions at the time of illness.[8,9] Patient education restricted to the mere transfer of written information will not result in changes of behaviour.[11,12]

The aim of this study was to examine how the consulting behaviour of patients with a cough was affected when the tasks and responsibilities of patients, practice nurses and general practitioners were reorganized. In eight practices the effects of a rational policy on cough and systematic patient education were examined, with special attention to the way in which patients are influenced by the general practitioner and practice nurse.[13] Answers to the following questions were sought:

— Does the consulting behaviour of patients change in the desired direction?
— Does the number of episodes of cough a patient has suffered affect the change in consulting behaviour?
— Is a positive change in consulting behaviour connected with patients delaying consulting longer than recommended?

Method

Intervention

The intervention was carried out during the autumn-winter periods (1 October–1 April) in 1986 and 1987. The general practitioner or practice nurse obtained a standardized history from patients presenting with respiratory symptoms including cough in order to exclude from the intervention patients younger than one year or older than 60 years, patients with asthma or chronic bronchitis and patients using heart medication. In addition, the type of cough was defined as a dry tickling or nocturnal cough, or cough with 'serious' symptoms — dyspnoea or wheezing, shivering or fever (>38 °C) for more than four days, green or bloody sputum.[14] Coughs which had none of the symptoms of these two types of cough were defined as an everyday cough.[14]

When the patient had no serious symptoms general practitioners were instructed to omit physical examination. When patients consulted with an everyday cough general practitioners and practice nurses were instructed to provide only self-care advice and not to prescribe linctus. The practice nurse could write out a prescription (to be signed by the general practitioner) for codeine, noscapine or promethazine (for children) for patients with a tickling or nocturnal cough. The practice nurse was

structed to refer patients with serious symptoms to the general practitioner.[14]

A leaflet, consisting of one double-folded page, was to be used during every consultation for cough. It contained five categories of information:

— Details of criteria which excluded patients from the intervention.
— Statements on the self-limiting character of respiratory symptoms and aggravation of the complaints by smoking.
— Self-care advice for treating the discomfort (a spoon of honey, a cup of warm tea, hot aniseed milk or chicken soup) and for inhalation (hot water with menthol).
— Advice to ask the practice nurse for a prescription in cases of dry tickling or nocturnal cough.
— Advice to consult the general practitioner when a cough had persisted for at least three weeks or was accompanied by one of the serious symptoms.

The general practitioner or the practice nurse discussed the content of the leaflet with patients and asked them to keep it and to consult it when they next had a cough.[15]

Study practices

The number of practices taking part in the study was restricted to eight in order to eliminate practice influences and to standardize the intervention as much as possible. From a group of 57 single-handed general practitioners practising in and around Nijmegen detailed information was available on 14 variables, including prescribing behaviour (for example, prescribing of cough medicines), list size, distance to the nearest hospital and age–sex distribution of the practice population.[16] These variables were divided into quartiles. Practices were chosen from the two middle quartiles to avoid those with an extremely high or low level of care. The four pairs that were most similar were selected, with special attention to the number of prescriptions issued, the general practitioners' attitude to somatic symptoms, their receptiveness to a contribution from the patient and how well they explained their actions to the patient. In every pair one practice was randomly assigned to the experimental group and the other to the control group. This matching was successful only to a limited extent. The type of medical care provided by the experimental practices before the intervention corresponded more with the standards applied by the authors than that provided by the control practices. Fewer patients in the experimental practices consulted for cough than in the control practices. Among those patients consulting, 25% consulted for everyday cough and 37% for cough with serious symptoms in the experimental practices compared with 47% and 27%, respectively, in the control practices. A description of the practices is given in Table 1.

Table 1. Details of the eight study practices.

	Experimental group ($n=4$)	Control group ($n=4$)
Total number of patients	11 120	9511
% of male patients	*50*	*51*
% of patients covered by health insurance	*71*	*73*
% of patients >60 years old	*16*	*24*
% of patients aged 1–60 years consulting for cough in the year before intervention	*8.7*	*13.5*

n = number of practices.

Study design

The patients' first contact for cough was considered to be uninfluenced by the intervention and was used to determine the consulting behaviour before intervention. The patient education was provided during this contact. Between the two autumn-winter periods the leaflet was sent to all the patients in the experimental practices. Thus, first contacts in the second autumn-winter period could not be considered as pre-intervention contacts. In all post-intervention contacts the patient received the same education as in the first consultation. For all contacts a record was made of whether or not the patient followed the guidelines, that is consulted the practice nurse for a dry tickling or nocturnal cough and the general practitioner for coughs persisting longer than three weeks or accompanied by serious symptoms.

Any changes in consulting behaviour were determined by comparing the behaviour in the pre-intervention contact and the following contacts. Therefore, patients who had consulted only once or only in the second period had to be excluded from the analysis. Changes of behaviour were grouped as follows:

— Desired change: consulting behaviour before intervention did not follow the guidelines but did in at least half of the following contacts, including the final one.
— Unchanged, followed guidelines: consulting behaviour followed guidelines before intervention and also in at least half of the following contacts, including the final one.
— Unchanged, did not follow guidelines: consulting behaviour did not follow guidelines either before intervention or in at least half of the following contacts, including the final one.
— Undesired change: consulting behaviour before intervention followed the guidelines, but did not in at least half of the following contacts, including the final one.
— Undefinable: all other combinations, for example, change in desired direction but final contact did not follow guidelines.

All the patients who consulted their general practitioner for cough in the first autumn-winter period were asked to fill in a 'cough diary' during the six months of the second period. They were asked to note every day whether they had a cough and any accompanying symptoms. If they reported a cough they were asked to indicate which of the following alternatives best corresponded to their behaviour: 'I did not do anything', 'I tried something myself', 'I used medication on prescription', 'I went to the doctor/I sent for the doctor'. An episode of cough was defined as a period of at least two days with cough; a new episode of cough was considered to have started if no cough had been registered for at least two consecutive days. In this way it could be determined whether patients had failed to consult the general practitioner for cough that lasted longer than three weeks or that was accompanied by serious symptoms.

In order to establish to what extent general practitioners and practice nurses behaved according to the guidelines, deviations from the protocol were recorded on a registration form and controlled by evaluation of periodic tape recordings of consultations for cough.

Comparison of the episodes of cough recorded in the diary with episodes recorded by the general practitioner or practice nurse on prestructured forms showed that the diary note 'I used medication on prescription' did not always indicate that the patient had been in contact with a practice nurse or general practitioner. The forms have therefore been used in the analysis of the consulting behaviour.

Analysis

The change in behaviour of patients with at least two contacts was analysed. Since the consulting behaviour of patients from

the experimental group before the intervention appeared to agree more with the guidelines than that of the patients in the control group the effect of the intervention has been separately studied for patients whose behaviour did and did not agree with the guidelines at the first contact.

To study the relation between the change in consulting behaviour and the number of times patients received the education the control group as a whole has been compared with the experimental group divided according to the number of contacts with a general practitioner or practice nurse. Patients were also divided according to the number of episodes of cough reported to determine whether this affected the change in consulting behaviour.

The chi-square test or Fisher's exact test were used to compare the changes of behaviour. A P value of less than 0.05 was taken to be statistically significant.

Results

A total of 2624 patients meeting the initial inclusion criteria contacted the general practitioner or the practice nurse over the two intervention periods. Of these patients 1953 had only one contact for cough and were therefore excluded. Data were available only in the second period for a further 123 patients. Changes in behaviour were therefore investigated in the remaining 548 patients — 224 in the experimental group and 324 in the control group. Of the 548 patients 353 had made two contacts, 115 three and 80 four or more.

Of the total 2624 patients, 1792 made contact in the first period. Sixty four per cent of these contacts were with a general practitioner. These 1152 patients were asked to complete a 'cough diary' in the second autumn-winter period — 622 did so correctly and mentioned at least one episode of cough. Among these patients 238 belonged to the group of 548 for whom change of behaviour could be investigated — 113 were in the experimental and 125 in the control group.

In only six per cent of the contacts for cough was there a deviation from the practice guidelines — in 129 of contacts with practice nurses and 3% with general practitioners.

Changes in consulting behaviour

Patient behaviour changed in the desired direction for significantly more patients in the experimental group than in the control group (Table 2). Moreover, among patients whose behaviour already conformed to the guidelines in the first contact, significantly more patients in the experimental group maintained this behaviour in the following contacts than in the control group (Table 2). The educational intervention clearly resulted in a shift in the desired direction. The more times patients received the education the greater the change in consulting behaviour (Table 3).

Table 2. Changes in consulting behaviour according to whether patients' behaviour conformed to the guidelines at the initial contact.

	Initial behaviour did not follow guidelines (% of patients)		Initial behaviour followed guidelines (% of patients)	
Change of behaviour	Experimental group (n = 122)	Control group (n = 232)	Experimental group (n = 102)	Control group (n = 92)
Desired change	*56*	*30*	N/A	N/A
Undesired change	N/A	N/A	*30*	*67*
Unchanged	*42*	*68*	*66*	*29*
Undefinable	*2*	*2*	*4*	*3*
	$P<0.001$		$P<0.001$	

n = number of patients. N/A = not applicable.

Episodes of cough

Of the 238 patients completing the 'cough diary' 54% recorded between one and four episodes of cough, 18% five or six episodes, 18% between seven and nine episodes and 10% recorded at least 10 episodes. Fewer patients in the experimental group than in the control group reported more than four episodes of cough (42% versus 50%), but this difference was not significant.

The intervention appeared to be as effective in patients reporting four episodes of cough or less as effective in patients reporting more. The difference in the percentages of patients in the experimental and control groups whose behaviour either changed in the desired direction or followed the guidelines before and after the intervention was 26% for patients reporting four or less episodes and 31% for those reporting more (non significant difference) (Table 4).

Patient delay in consulting

In the experimental practices patients with a cough lasting longer than three weeks or one with serious symptoms did not delay consulting their general practitioner any more often than patients in the control practices (Table 5). In the experimental practices, patients whose behaviour either changed in the desired direction or followed the guidelines before and after intervention delayed consulting significantly less often than patients with similar behaviour patterns in the control group (Table 5).

Table 3. Changes in consulting behaviour according to how often patients had received education on cough and whether patients' behaviour conformed to the guidelines at the initial contact.

	Initial behaviour did not follow guidelines (% of patients)			Initial behaviour followed guidelines (% of patients)		
	Experimental group			Experimental group		
Change of behaviour	2 contacts (n = 84)	>2 contacts (n = 38)	Control group (n = 232)	2 contacts (n = 74)	>2 contacts (n = 28)	Control group (n = 92)
Desired change	*49*	*71*	*30*	N/A	N/A	N/A
Undesired change	N/A	N/A	N/A	*34*	*21*	*67*
Unchanged	*51*	*21*	*68*	*66*	*64*	*29*
Undefinable	*0*	*8*	*2*	*0*	*14*	*3*
		$P<0.001$			$P<0.001$	

n = number of patients. N/A = not applicable.

Table 4. Change in consulting behaviour according to the number of episodes of cough reported by patients.

Change of behaviour	% of patients reporting 4 episodes or less		% of patients reporting more than 4 episodes	
	Experimental group ($n=66$)	Control group ($n=63$)	Experimental group ($n=47$)	Control group ($n=62$)
Desired change/ unchanged[a]	64	38	60	29
Undesired change/ unchanged[b]	36	57	32	69
Undefinable	0	5	9	2
	$P<0.001$		$P<0.001$	

n = number of patients. [a]Followed guidelines, [b]did not follow guidelines.

Table 5. Changes in consulting behaviour according to the number of times patients delayed consulting when they had a cough lasting longer than three weeks or with serious symptoms.

Change of behaviour	Number of times patients delayed consulting (% of patients)					
	Experimental group			Control group		
	0	1	⩾2	0	1	⩾2
Desired change ($n=39/27$)	62	28	10	59	19	22
			$P<0.05$			
Unchanged, followed guidelines ($n=24/54$)	63	17	21	43	31	26
			$P<0.01$			
Unchanged, did not follow guidelines ($n=31/15$)	42	29	29	47	33	20
Undesired change ($n=15/25$)	40	40	20	44	32	24
Undefinable ($n=4/4$)	50	0	50	50	25	25

n = number of patients in experimental/control group.

Discussion

This study has shown that patients' consulting behaviour when they have a cough can be influenced in the desired direction by means of a relatively simple modification of the usual policy, although many patients continued to ignore the guidelines. If the consulting behaviour of the patients in the experimental practices before the intervention had been less in line with the guidelines the results would have been even more striking.

There were problems with the design of this study. First, it is not, strictly speaking, possible to measure uninfluenced consulting behaviour, as patients who consult already comprise a selected group. Secondly, using the proportion of patients who have serious symptoms provides only an indirect measure of consulting behaviour. Finally, completion of a 'cough diary' introduces a possible source of bias. Although patients in the control group also completed a diary, they were probably influenced by it in a different way from patients who had received education about consulting with a cough. This bias, however, could not be avoided or quantified.

In this study 'change of behaviour' has been based on only two contacts with either the general practitioner or practice nurse. Thus, the long term effects of patient education are uncertain. The continued implementation of the modified policy over the next few years will be essential and the general practitioner is in the best position to provide this continuity of care.

The assumption that improvement in the consulting behaviour would be accompanied by delayed attendance by patients who had a cough for more than three weeks or had serious symptoms appeared to be ungrounded. In fact, differences in this respect were in favour of the group receiving the educational intervention. Surprisingly, the number of episodes of cough suffered by patients did not appear to influence the effect of the intervention. It might have been expected that people who have suffered more episodes would exert greater pressure on the general practitioner or practice nurse for help, even if this were inconsistent with the guidelines. It seems likely that the education increased patients' awareness of the types of self care available.

It can be concluded that with relatively little effort on the part of general practitioner and practice nurses, patients can be stimulated to modify their behaviour and take more responsibility for their own illness. According to some authors, consistent application of guidelines of this nature by general practitioners and practice nurses might considerably reduce the costs of health care.[17]

References

1. Lamberts H, Meads S, Wood M. Waarom gaat iemand naar de dokter? Een internationale studie met de reason for encounter classification. *Huisarts Wet* 1984; **27:** 234-244.
2. Morrell DC. *Minor illness and how to treat it in the home.* 2nd edition. London: The Health Education Council, 1980.
3. Seiler ER, Watson LM. Illness-specific cards, a feasibility study. *J R Coll Gen Pract* 1982; **32:** 435-439.
4. Sox HC, Sox H, Tompkins RK. The training of physician's assistants. The use of a clinical algorithm for patient care, audit of performance and education. *N Engl J Med* 1973; **288:** 818-824.
5. Roberts CR, Imrey PB, Turner JD. Reducing physician visits for colds through consumer education. *JAMA* 1983; **250:** 1986-1989.
6. Estabrook B. Consumer impact of a self-care center in a prepaid ambulatory care setting. *Med Care* 1979; **7:** 1139.
7. Zapka J, Averill BW. Self-care for colds: a cost-effective alternative to upper respiratory infection management. *Am J Public Health* 1979; **8:** 814-816.
8. Moore SH, LoGerfo JP, Inui TS. Effect of a self-care book on physician visits. *JAMA* 1980; **243:** 2317-2320.
9. Berg AO, LoGerfo JP. Potential effect of self-care algorithms on the number of physician visits. *N Engl J Med* 1979; **300:** 535-537.
10. Vickery DM, Fries JF. *Take care of yourself. A consumer guide to medical care.* Reading, Massachusetts: Addison-Wesley, 1976.
11. Silten RM, Levin LS. Self-care evaluation. In: Lazes PM (ed). *Handbook of health education.* Germantown, Maryland: Aspen, 1979.
12. DiMatteo MR, DiNicola DD. *Achieving patient compliance. The psychology of the medical practitioner's role.* New York: Pergamon Press, 1982.
13. Beek MML, Van Eijk JThM, Rutten GEHM. Patiëntenvoorlichting over hoestklachten in de huisartspraktijk. In: Cuisinier MCJ, Van Eijk JThM, Grol R, Jonkers R (eds). *Patiëntenvoorlichting in de eerste lijn.* The Hague: Uitgeverij voor Gezondheidsbevordering, 1989.
14. Rutten GEHM, Van Eijk JThM, Beek MML, Van der Velden HGM. Cough in general practice: towards a rational management. *Huisarts Wet* 1988; **31:** 293-299, 307.
15. Beek MML, Van Eijk JThM, Rutten GEHM. Hoesten: naar de dokter of niet. Een patiëntenfolder over hoesten. *Huisarts Wet* 1988; **31:** 299-300.
16. Grol R, Mokkink H, Smits A, *et al.* Work satisfaction of general practitioners and the quality of patient care. *Fam Pract* 1985; **2:** 128-135.
17. Anonymous. Cough medicines. *Drug Ther Bull* 1985; **23:** 85-86.

Address for correspondence

G Rutten, Haagstraat 19, 6641 AH Beuningen, The Netherlands.