

Bronchial asthma and self-management education: implementation of Guidelines by an interdisciplinary programme in a health network

Study of Respiratory Education Group (REG)

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Summary

Asthma is a chronic disease generating very high costs even for Switzerland. Self-management education (SME) is effective and recommended as an integral part of management in the most recent guidelines on asthma treatment. Its aim is to reduce morbidity [hospitalisations (H), lost workdays (LW), emergency consultations (EC)] and improve quality of life (QOL) in these patients.

Method: Integrated programme with educational platforms (two-language booklet), SME in 66 patients (30 m, 36 f) with interdisciplinary quality team (pneumologists, primary care physicians, pharmacists, specialised nursing staff), QOL questionnaire. Measurement of morbidity parameters 12 months before and after SME. Measurement of QOL before and 12 months after SME.

Results: Hospitalisations fell from 35 to 8%*, EC from 88 to 53%*. and LW from 39 to 14%*

(*p < 0.001). Overall, SME resulted in a health cost saving of CHF 202,510 in terms of LW and CHF 131,200 in terms of days in hospital, i.e. a total of CHF 333,710. Costs saved per patient were CHF 5,056 per year. QOL improved with the following scores: overall QOL 4.5 ± 0.9 to 5.2 ± 0.9*; activities 4.5 ± 0.9 to 5.2 ± 0.9*; symptoms 4.2 ± 1.1 to 5.2 ± 1.1*; emotions 4.9 ± 1.1 to 5.6 ± 1.1*; environment 4.5 ± 1.4 to 4.9 ± 1.3* (*p < 0.001).

Conclusion: SME by interdisciplinary health network is effective. It brings a steep fall in costs for asthma treatment by cutting back hospitalisations and lost workdays and by improving the asthmatics' quality of life. It should be recognised and better supported by the health system.

Key words: bronchial asthma; self-management; health network

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Introduction

Bronchial asthma is a chronic respiratory disease which is considered moderately severe but nevertheless has a major economic and social impact [1]. Not only in other countries [2] but in Switzerland [3, 4], the disease accounts for a not inconsiderable level of hospitalisations and lost workdays. The costs generated by the disease are enormous: they have been estimated at more than CHF 1.2 billion, some CHF 500 million of which are indirect [5]. Furthermore, asthma kills: Switzerland registers some 300 deaths/year [6], a

number which has unfortunately been growing in recent years. These figures are the more regrettable in that we have known for nearly 20 years that the majority of deaths involve young people and could be avoided by better coordinated care [7]. This state of affairs has prompted the medical community to publish international guidelines [8, 9] stressing the need to promote an interdisciplinary approach and self-management education, whose striking effectiveness needs no further demonstration [10–13]. Our present purpose is not

to conduct a further randomised controlled study. Recent European work [14] has surprisingly shown that in everyday medical practice the management of asthma has changed little, and this 10 years after the guidelines were drawn up. There is no difference in the quality of asthma care as between individual countries, and the goals of asthma treatment as defined are far from being achieved. Partridge and co-workers [15] emphasise in an editorial the importance of applying new management strategies in everyday medical practice if we wish to reduce asthma morbidity. It should also be noted that the GINA guidelines [9] stress the im-

portance of establishing local teams to improve the care of asthmatics. It is vital to adapt guidelines to local conditions if we want them to be effective.

The present study was undertaken to promote an interdisciplinary approach by creating a self-management education programme (SME) and measuring its impact, first, on the quality of life of moderately severe, non-decompensated asthmatics and, second, on direct and indirect health costs. To the best of our knowledge there has thus far been no interdisciplinary programme in Switzerland for the care of asthmatics which places the emphasis on outpatient care, as recommended [9].

Material and methods

Establishment of a health network: Respiratory Education Group (REG)

First, in conjunction with French-speaking Switzerland's two university hospitals, a panel bringing together pneumologists and nursing staff from the Ligue valaisanne contre les maladies pulmonaires et pour la prévention (LVPP) cooperated with communication professionals to produce a two-language SME booklet [16], which they took care to design as a simple, convivial and attractive tool irrespective of the user's educational level (fig. 1). All those who shared in this health network attended, prior to the inclusion of patients in the study, a 12-hour interdisciplinary seminar (primary care physicians (PCP), medical specialists (MS), pharmacists, nursing staff from the LVPP) covering the following objectives: active educational strategy, a dynamic in favour of acceptance of a long-drawn-out illness, management of an interdisciplinary team, role of the various players in patient education strategy, knowledge of asthma and the approach to its management by adapting the most recent guidelines available [9].

Patients

The study protocol was approved by the Geneva Medical Faculty Ethics Committee and supported by the

Swiss Academy of Medical Sciences. The patients included in the study were those with moderately severe asthma treated on an outpatient basis who had not presented an asthma attack requiring a hospital stay during the 30 days preceding entry into the study. They were fully informed of the study's aims and gave written consent to participation. Their forced expiratory volume in one second (FEV₁) was required to be $\geq 50\%$ of predicted value with more than 20% reversibility after bronchodilators. Since the programme was intended to apply as closely as possible to the subjects' real-life outpatient situation, we did not wish to include patients leaving hospital after acute attacks. The idea was to set out from the real outpatient situation and stimulate natural care networks to improve their interaction according to the model in figure 2. As recommended by GINA [9], we took as a basis the primary care networks including PCP and patients, while the other professionals respected the physician/patient relationship in their interventions. Patients under 16 were excluded from the study to avoid involving paediatric-age subjects. When agreeing to take part in the study patients were duly informed that we would be gathering information on bronchial asthma-related hospital stays, emergency consultations and lost workdays during the previous 12

Figure 1
Self management education (SME) booklet developed for the programme.

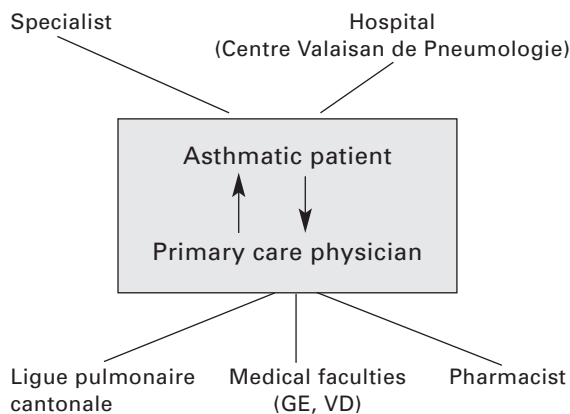


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Figure 2

Diagram of interaction between asthmatic patient and health professionals.



months. Where such information was unreliable the patient was excluded from the study both at the outset and in its course.

Direct and indirect costs: parameters measured

On each occasion patients completed a systematic questionnaire covering the following data:

- hospitalisations and length of hospital stay for asthma attacks,
- emergency consultations for asthma attacks,
- lost workdays due to asthma.

The average cost of a day's hospital stay or a lost workday is based on Federal Statistics Office averages.

Quality of life

To measure the change in quality of life occasioned by SME a questionnaire on quality of life covering four fields was administered to each patient by a trained person (AM) [17].

Educational intervention

Each patient received, on a pluridisciplinary basis coordinated by a physiotherapist (AM), education embracing the following objectives:

- basic information on the physiopathology, precipitating factors and measures for prevention of bronchial asthma;
- basic information on drugs;
- inhalation techniques;
- peak flow measurement;
- use of a personalised plan of action on the prevention and management of asthma attacks;
- active listening concerning the individual's experience of the illness;
- any other objective considered necessary by the patient's primary care physician and/or specialist.

Follow-up

Special care was devoted to ensuring the closest possible approximation to the real-life outpatient situation, by coordinating therapeutic objectives among the various health professionals without hospitalising the patient. The Centre Valaisan de Pneumologie acted as coordination centre. Each patient received a personal follow-up diary with written, individualised objectives. The diary was accessible to all the professionals involved, who also used it as a source of prospective patient data subsequently centralised at the CVP (AM). In this way it was possible to ensure the coherence of the therapeutic objectives pursued. The patient was seen again by the PCP or MS 3, 6, 9 and 12 months later in conjunction with the physiotherapist responsible for data collection.

Statistical analysis

The results were expressed as mean values with standard deviation and extremes. Statistical comparisons were carried out by t test matched for normally distributed quantitative values and by the chi-square test for ratios between groups or for non-normally distributed values.

Results

Patients and asthma-linked morbidity

76 patients (43 males, 33 females) with a mean age of 43 ± 16 (16–78) years and a mean FEV₁ of $79 \pm 23\%$ of predicted value were included in the study. They presented a high level of asthma-linked morbidity, since 37% of the patients had undergone at least one hospitalisation, 90% had had one or more emergency consultations and 41%

had had at least one episode of absence from work during the 12 months preceding the educational intervention (table 1).

Care network

The patients were chiefly drawn from the French-speaking area of the Valais: only seven were from the German-speaking area. Interaction

Table 1

Morbidity and resource consumption 12 months before and 12 months after therapeutic intervention (TI).

	12 months before TI			12 months after
	n = 76	n = 66		n = 66
Hospitalisations /H)	28/76 (37%)	23/66 (35%)	p <0.001	5/66 (8%)
Days	261	232		68
Duration (days)	9.3 ± 5.8 (1–21)	10.1 ± 5.9 (1–21)		13.6 ± 4.0 (4–21)
Emergency consultations (EC)	68/76 (90%)	58/66 (88%)	p <0.001	35/66 (53%)
EC (n)	375	314		128
CU/patients	5.5 ± 4.6 (1–30)	5.4 ± 4.7 (1–30)		3.7 ± 3.1 (1.15)
Lost workdays	31/76 (41%)	26/66 (39%)	p <0.002	9/66 (14%)
Days	724	652		126
Duration (days)	23.35 ± 16.8 (2–85)	25.1 ± 17.9 (2–85)		14 ± 6.4 (2–40)

Table 2

Quality of life (QOL) before and 12 months after therapeutic intervention.

	before	12 months after	p
Overall QOL	4.5 ± 0.9	5.2 ± 1.1	<.001
Activity	4.5 ± 0.9	5.0 ± 1.1	<.001
Symptoms	4.1 ± 1.2	5.3 ± 1.3	<.001
Emotions	4.8 ± 1.2	5.6 ± 1.2	<.001
Environment	4.6 ± 1.4	5.0 ± 1.5	<.001

between disciplines involved 37 PCP, 7 MS and 7 pharmacists.

Results of educational intervention

Only 66 patients completed the 12-month follow-up. There had been no difference between the 10 patients and these 66 in terms of severity measured by spirometry, of morbidity or of anthro-

pometry (age, sex, educational level). Of the 10 patients who did not complete the study, two were lost to follow-up, two considered themselves sufficiently well treated and saw no benefit in continuing with the programme for the full 12-month period, and six could not be retained in view of imprecise data concerning hospitalisations or emergency consultations. A steep, significant fall in direct or indirect costs was observed (table 1). Quality of life, as measured by the questionnaire, likewise improved significantly both in general and with respect to the four specific parameters measured (table 2). The same was true of asthma-induced sleep disturbances ($p < 0.001$). An estimate of cost savings based on prior Swiss data shows that these were substantial, even counting only hospitalisation costs and lost workdays (table 3).

Table 3

Health costs saved (66 patients).

Indirect costs:	526 lost workdays × 385.–	= CHF 202'510.–
Direct costs:	164 days' hospitalisation × 800.–	= CHF 131'200.–
	Total	CHF 333'710.–
Cost saving per patient		CHF 5'056.–

Discussion

This study shows that self-management education, even in patients with mild to moderately severe asthma, improves the patients' state of health and occasions a steep fall in the cost of caring for them. A reduction in costly hospitalisations is observed, as is – a fact perhaps less known – a fall in the cost of workdays lost to unstable asthma. Moreover, health professionals have demonstrated their capacity to work within an interdisciplinary framework, not only among physicians but among physicians, pharmacists and specialised nursing staff. As far as we know this is the first case, in the field in Switzerland, of interaction between different health professionals to create a self-management education programme. As already shown recently in Switzerland [18], the sounder the health professionals' knowledge of this disease, the more the costs of asthma care will fall – in particular thanks to better management of asthma attacks with their attendant unnecessary hospitalisations and lost workdays. However, our study differs from that one on two points: it is not a descriptive study of care but a programme of interdisciplinary intervention involving a number of health professionals, including pharmacists; we have established a coordinated health network using all the professional competences of health leagues and pharmacists, who by their synergisms act as the physician's therapeutic reinforcements, whether he be primary care physician or specialist. We thought we should take the Quebec teaching programme on asthma [19] as our pattern, since its goal is not only

to improve patients' quality of life but give them back their independence. The Québécois estimate that they achieve a reduction of some \$ 10 million per year in the economic burden of asthma. It can of course be objected that we have no control group. We did not wish to conduct a randomised controlled study to demonstrate the effectiveness of self-management education; this has already been done and recommended by international guidelines. What we have conducted is a field study with measurement of the result of the intervention based on parameters of quality of life and morbidity. As in pharmacology, when a substance has proved its efficacy subsequent work should not repeat, at exorbitant cost, what has already been done; so the education of asthmatics, having proved its efficacy, needed to be applied in the clinical field with a few parameters serving to evaluate its efficacy in the light of local conditions. These results should however be put in proper perspective, for two reasons: the health professionals especially motivated to acquire new knowledge had the benefit of interdisciplinary training which rendered their intervention more effective; moreover, it is not impossible that the patients enrolled in the study were selected because of a more pronounced motivation to know their disease better and improve their treatment. Such favourable conditions are not necessarily met with in the normal asthma population. It is well known, for example, that the risk of asthma attacks and mortality is stratified not only according to physiological but also psychoso-

cial criteria [20]. Implementation of an interdisciplinary programme of this kind in the overall asthma population could well produce less effective results. The objectives of asthma education would then have to be adapted to patients' needs, which differ from one group to another.

Another probable reason for this study's success is that we attempted to promote the patients' independence by giving them time to speak and express not only their needs but also their representation of the disease. A ready ear of this kind is essential to promote optimum communication between patient and health professional [21]. For example, whenever a patient consulted one or the other health professional, it was the rule that the objectives of each consultation would be defined by common consent.

It may be thought that the improvement in these patients' quality of life can be ascribed to the health professionals' closer attention to their patients without a resultant improvement in these patients' independence and capacity to self-manage and prevent asthma attacks. The steep fall in asthma-related morbidity and the significant improvement in technical knowledge concerning inhalation or the use of peak flows (results demonstrated but not published here) argue against such a hypothesis. We used this quality-of-life scale [17] because it had been developed specifically for asthmatics and validated in several languages.

We might have conducted a more elaborate cost/benefit analysis in order to bring out the results of the study more clearly. However, we confined ourselves to simple, unquestionable parameters easily checked with the primary care physician or sickness insurance (days in hospital, workdays lost, emergency consultations). We excluded six patients from the results, precisely because we could not rule out that some hospitalisations might be poorly documented or not obviously related to an asthma attack. There are no differences in terms of clinical parameters, morbidity or drug consumption between the 10 patients excluded and the total population retained at the end of the study. To carry out a more extensive cost/benefit analysis it would have been necessary to measure many more parameters. In the sphere of costs, we did not measure, for example, the cost of an emergency consultation in a hospital or stays in intensive care, two factors which would have increased costs and further enhanced the favourable result of the study. Similarly, in the sphere of indirect costs, we did not allow for additional costs such as ambulance transport, loss of family productivity in relation to asthma attacks etc. Another item for inclusion in costs would have been training sessions for the professionals involved. This study was original in establishing a care network while setting in train a continuous process of care improvement through an interdisciplinary approach involving doctors, specialised nurses and pharmacists, thus improving the communication interface between health professionals and between the latter and the patient him/herself.

Such a process has a ripple effect which is difficult to measure but enhances the education of a large number of asthmatics, thus improving their self-management and reducing their consumption of health resources. The REG group, for example, began by issuing a booklet for internal use which we soon found we had to issue in printed form in view of its success among health professionals and patients alike. This booklet was first used in a number of French-speaking Swiss cantons thanks to the support of those cantons' other associations fighting lung disease. We were then requested to publish a German version. The fact that 75,000 published copies were soon exhausted is indirect evidence not only that it met a need encountered in the population and among medical teams to improve patient information, but also that this teaching resource, designed as an interdisciplinary educational platform, was well suited to its purpose. This should also be taken into account if we wish to form a more precise estimate of our project's benefits.

Our study further demonstrated that it is possible to develop a new therapeutic strategy which is not centred on the hospital but on an interdisciplinary approach closely adapted to the patient's real situation and aimed, precisely, at keeping him out of hospital. It is quite possible that these patients paid more outpatient visits than usual, since this was programmed by the study protocol. Afterwards it is difficult to check with doctors on the number of consultations in the 12 months preceding the education scheme, data of this kind being less reliable than strict accounting data such as lost workdays or days in hospital. Nevertheless, a hypothetical increase in outpatient consultations will surely never exceed the costs of hospitalisation or lost workdays saved by such an approach. As two major recent studies [1, 22] suggest, health professionals, faced with soaring health costs in the new millennium, are committed to developing new, more effective therapeutic strategies, but for this they need the support of the responsible authorities.

In a study looking forward to the medicine of the 21st century [22], the World Health Organisation stresses the importance attaching to optimum management of the intellectual capital constituted by the vast range of partners and networks in the health field. The best scientific guidelines are of little use if we lack the means to give them effect in the individual patient's real medical world, before he/she "abusively" consumes health resources.

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