

if they were seen by a respiratory physician than if the family doctor alone arranged the concentrator installation.

We are currently studying concentrator machines installed in 1986 in the UK by analysing contracting company records. Physicians vary widely in their prescribing habits and their patients even more in compliance (table 1). 36% of patients were prescribed oxygen for less than effective daily durations. Patient compliance deteriorated at higher daily prescribed hours.

Table 1. — O₂ usage of 531 oxygen concentrators installed in 1986 in the UK and subsequently removed

Category of daily O ₂	n	Prescribed h	Actual usage h
<15 h daily	192	10.2 (4–14)	9.9 (0–24)
>15 h	339	17.9 (15–24)	13.4 (0–24)

Data taken from contracting company records of prescription and clock readings on the machines. Values are means with ranges in brackets.

Conclusion

LTOT is a complex and expensive treatment imperfectly understood by many physicians and patients. It requires a careful selection of patients, constant

education to explain the nature of the disease and reason for therapy and a good home care service providing regular home visits. Compliance with therapy is below the level at which clinical benefit is to be expected in at least 50% of treated patients.

References

1. Medical Research Council Working Party. — Long term domiciliary oxygen therapy in chronic hypoxic cor pulmonale complicating chronic bronchitis and emphysema. *Lancet*, 1981, i, 681–685.
2. Nocturnal Oxygen Therapy Trial Group. — Continuous or nocturnal oxygen therapy in hypoxemic chronic obstructive lung disease: a clinical trial. *Ann Intern Med*, 1980, 93, 391–398.
3. Report of the Committee for the Assessment of Biometric Aspects of controlled trials of hypoglycemic agents. *JAMA*, 1975, 231, 583–608.
4. Evans TW, Waterhouse JC, Howard P. — Clinical experience with the oxygen concentrator. *Br Med J*, 1983, 287, 459–461.
5. Vergeret J, Brambilla C, Mounier I. — Portable oxygen therapy: use and benefit in hypoxaemic COPD patients on long-term oxygen therapy. *Eur Respir J*, 1989, 2, 20–25.
6. Walshaw MJ, Lim R, Evans CC, Hind CRK. — Prescription of oxygen concentrators for long term treatment; reassessment in one district. *Br Med J*, 1988, 297, 1030–1032.
7. Walshaw MJ, Lim R, Evans CC, Hind CRK. — Factors influencing compliance in patients using oxygen concentrators for long term home oxygen therapy. *Thorax*, 1989, 44, 900P.

Lessons from diabetes education?

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At the moment about 20,000,000 people world-wide are treated with insulin. This is unbelievable and even wonderful considering insulin was only discovered in 1921 by Banting and Best in Toronto. As we all know, diabetes is a chronic disease induced by a relative or absolute deficit in insulin, inducing hyperglycemia and, in the long term, leading to specific complications. Two different groups can be distinguished: type I or juvenile diabetes and type II diabetes. Each of them has its own characteristics and its own schedule of treatment.

It is only for the last 20 years that physicians have dealt with the typical management of 'chronic incurable' illness in which patients can participate in their own care. For diabetes, for example, it was in 1977 that the first congress was organized in Geneva by a specific study group (DESG= diabetes education study group). This group is a part of the European association for the study of diabetes (EASD).

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Is education helpful?

The first important question has to be "is education of the diabetic patient helpful?". Studies had shown that it reduced hospitalisation, especially for diabetic dysregulation and foot problems. It also reduced the acute complications (ketosis and severe hypoglycemia) as well as the number of leg amputations [5].

The disease and treatment characteristics

Before going in detail into the "education process" we have to describe the specific characteristics of therapy and disease. The therapy of diabetes is based on four areas: treatment with oral anti-diabetic medication or insulin injections, diet, physical exercise and education.

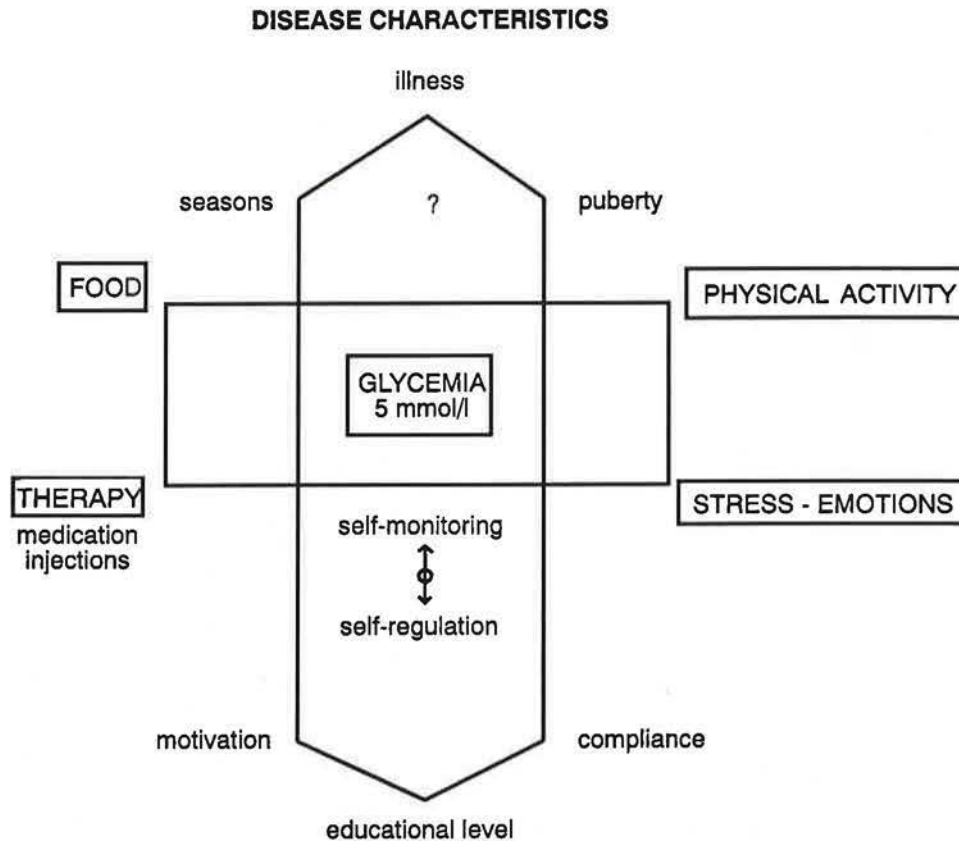


Fig. 1. – Disease characteristics: parameters like food, therapy, physical activity and stress-emotions are important by influencing glycemia.

The disease characteristics are represented in figure 1. It is important to understand that the glycemia is constantly influenced by several elements of which food, insulin dose, physical activity and stress are the most important. To achieve a good self-regulation of diabetes, the patient must have a good understanding of all these interactions. Good self-regulation means good mean-glycemia and good quality of life. This goal can be reached by self-monitoring of glycemia and by adapting food or insulin dosage to glycemia and circumstances.

All chronic illnesses, including diabetes, have psychological sequelae. That is the reason why diabetic patients have some typical attitudes and behaviours. We have to consider that the compliant diabetic swims against a cultural tide of excessive alcohol, tobacco, calories and inactivity. They constantly search for better health and better quality of life with fewer restrictions. "They never have a day off": although we can say that diabetics can lead an active, happy and productive life by accepting the disease and by employing and by employing self-regulation, they *cannot* have a normal life style.

The attitude of professionals

It is very important to know which of the following attitudes are unproductive when educating patients: blind belief in the efficacy of treatment; hiding behind professional roles; being superior; overestimation of the

compliance by the patient; failure to deal with his/her own feeling and anxieties; or being unable to say "I don't know". It is a pity that most doctors are bad educators, because most of them have not been trained for such role.

The education process

In figure 2 we try to explain a model of a diabetes education process. In fact education is an interaction between a diabetic professional team and the diabetic patient(s) [3]. For a good compliance it is very important to have a good, enthusiastic team. It was reported that compliance increased if the patient liked the physician, the receptionist, the nurse, the dietitian and other professional team members.

Knowledge of a number of topics are considered essential for these patients; (hence they are the objectives of diabetic education): identification of diabetes, its risks (acute chronic), diet, oral hypoglycemic agents, insulin, exercise, self-monitoring, self-regulation, routine check-ups. Once a patient becomes diabetic, he/she takes a specific "education train" together with the education team. At the moment of diagnosis an acute education phase is started. Most of the time this is an individual training, where certain barriers of typical psychological changes can be recognized because of the confrontation with the disease (cfr. Kuebler Ross).

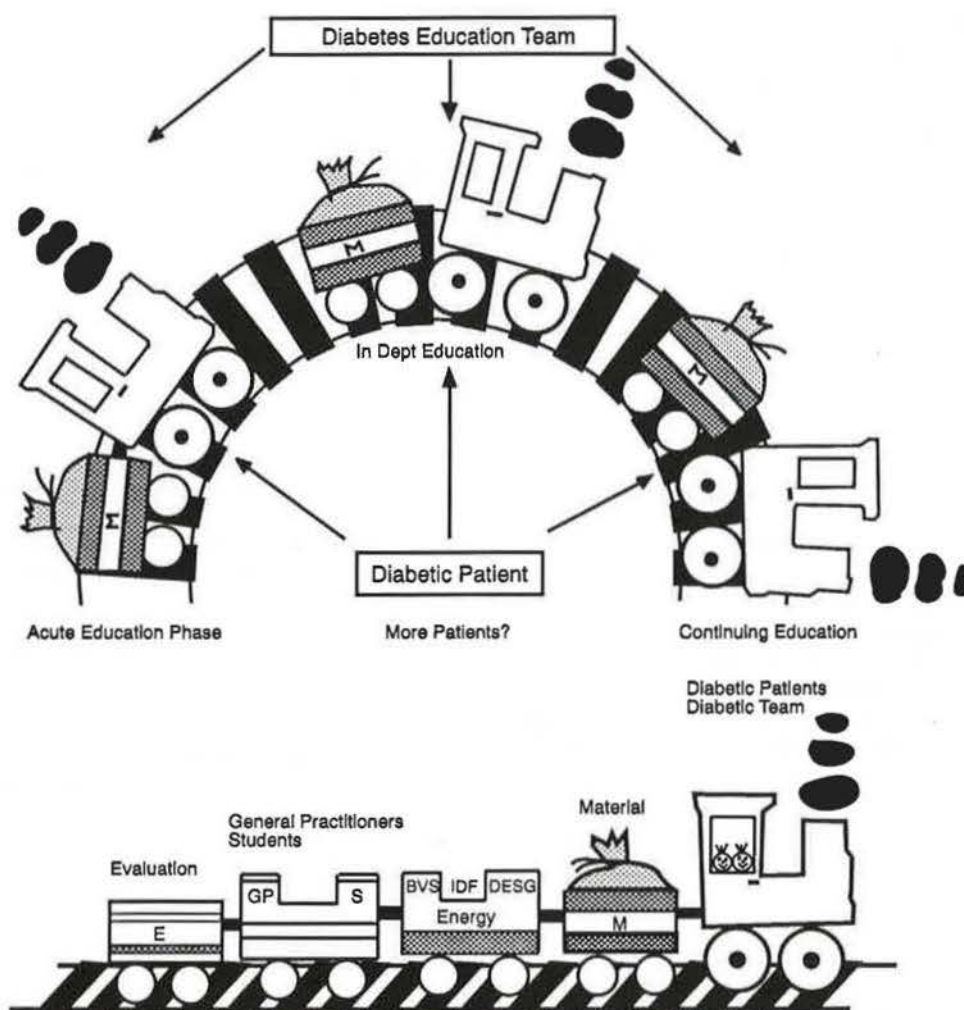


Fig. 2. - The educational process (upper part); the education-train (lower part): education is only possible with enough material and inspiration from organisations. Training of students and re-evaluation of the process are also necessary.

Later on the train moves further to "in depth education" of a group or an individual or for education of specific items such as pen- or pump-therapy. Typical educational points must be checked regularly by the team, *i.e.* chronic education. The most important point with respect to prevention is to re-inforce the knowledge about foot care and keto-acidosis. Looking at the "education train" we have the locomotive in which the interaction of patients and an enthusiastic team takes place. Of course the other parts of the train have their own specific and important role. For example, sufficient good teaching material is needed. Energy and motivation must be provided by different national and international organisations such as EASD, DESG, IDF (International Diabetes Federation). The educational programmes have to reach the general practitioner and the student. Last, but not least, evaluation of the whole system is necessary.

Evaluation of education programmes

Three parameters can be used to evaluate quality of diabetes therapy: metabolic parameters (haemoglobin A_{1c}, self-monitoring results), late complications

(retinopathy, leg amputation, ...) and psycho-social parameters (incidence of sick leave, independence, general quality of life, family planning, travel, ...) [1]. Many new techniques are being developed to evaluate education knowledge and to help educational programmes such as computer programmes IDC and Camit[®]. The IDC[®] is an insulin dosage computer helping diabetic patients to adapt their insulin therapy according to glycemia, exercise and meals. The adaptations are made on the basis of algorithms which can be altered by the physician. The Camit[®] can help the physician to analyse the results of self-monitoring in a very complete way. The computer provides analyses related to diet, exercise, hypoglycemia, ... This cannot be done by the physician at the out-patient clinic where time is limited. The system discussed here can also give an idea of the behaviour of the patient, which is very important.

As we all know, there is a great difference between knowledge and behaviour as remarked by K. Lorenz: "Gesagt is nicht gehört, Gehört is nicht verstanden, verstanden is nicht einverstanden, einverstanden is nicht angewendet, angewendet is noch lange nicht beibehalten".

Reasons for bad compliance

Several factors may influence compliance: the experience and subjective understanding of illness, the treatment, the environment of the patient and the doctor-patient-team relationship. Typical causes of poor motivation for diabetic patients are absence of clinical signs, incomplete acceptance of the disease or a state of depression [2]. In case of demotivation the clinician has to find out the reason, otherwise further education is lost time! To succeed, the education team needs, as we have already said, profound knowledge about: specific characteristics of disease and therapy, the education process with precise objectives, behaviour and motivation of the diabetic patients and their own restrictions as professionals [4].

Discussion

We have tried to describe the different elements necessary for good diabetic educational programmes. A lot of similarities can be found with education programmes for asthma and COPD-patients. These are also chronic diseases with typical psychological sequelae. Some identical objectives of education can be found such as diet control to avoid additives, specific treatment in asymptomatic periods, breathing exercises and provision of self-monitoring (peak flow

meter). Motivation for routine check-ups is also necessary.

As always, an enthusiastic team is a must to receive good compliance. Just like in diabetes, bad compliance can be based on moments of absence of clinical signs. Indeed, diabetologists and chest physicians can learn from each other.

I would like to conclude with the words of a Belgian diabetologist who gives some advice to young colleagues: "Listen to your patient. The key of problems is more often found by talking than in lab tests" (Jean Pirart).

References

1. Assal J-Ph, Berger M, Gay N, Canivet J. - Diabetes Education, How to improve patient education? In: *Excerpta Medica*, 1983.
2. Sulnay M, Tupling H, Webb K, Harris G. - New techniques for changing compliance in diabetes. *Diabetes Care*, 1980, 3, 180-111.
3. Donnel D, Etzurler B. - Patient education and management: a team approach. Ellenberg and Rifkin's *Diabetes Mellitus Theory and Practice*, Fourth edition, Elsevier, 942-948, 1990.
4. Hunt JA. - Twenty-five years of a diabetes education centre. *Diabetic Medicine*, 1990, 7, 400-406.
5. Kaplan RN, Davis WK. - Evaluating the costs and benefits of out-patient diabetes education and nutrition counseling. *Diabetes Care*, 1986, 9, 81-86.

Compliance: stimulating patient cooperation

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It is a truism that the degree to which patients adhere to medical advice is worryingly low. In patients with respiratory illness, non-compliance with medication can have quite disastrous consequences. Kinsman and colleagues, for example, have shown that hospitalization and rehospitalization in patients with asthma are co-determined by inadequate illness behaviour, where erratic use of medication was a major cause of poor medical outcome [1]. Other researchers have demonstrated that in patients with asthma, rates of compliance vary between 11% and 60% [2, 3]. A starting point of this paper, therefore, is that compliance with medication in patients with respiratory illness is low and leads to negative effects. I will try and give a concise overview of theoretical models of compliance, and suggest ways by which the physician, in cooperation with the patient, can help improve compliance.

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Theoretical models

The impressive theoretical and empirical work that has been done on compliance in the last three decades can be conceptualised in five approaches [4, 5].

The biomedical approach. In this approach, which dominated research in the fifties, compliance was viewed as a disposition (a stable personality characteristic) of the patient. Age, sex, occupation, socio-economic status were studied as potential determinants of non-compliance. Next, characteristics of the medical regimen, with an emphasis on aspects of the structure of the treatment (e.g. waiting time, duration, complexity, costs) were added to the research models. However, low correlations were observed. Interventions that aimed at improving compliance (for instance *via* written reminders) resulted in marginal improvements [6]. Psychological and social determinants of compliance were not yet included in the research models.