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Type 1 diabetes: treatment without tears?

Published online: 31 August 2005
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Abbreviations DAFNE: Dose Adjustment for Normal Eating

The tight relationship between intensified insulin therapy for type 1 diabetes and increased risk of severe hypoglycaemia is axiomatic. This assumption is repeated in paper after paper, usually quoting the DCCT, in which patients allocated randomly to the intensive therapy arm of the study showed a three-fold increase in severe hypoglycaemia [1]. But the DCCT, which demonstrated beyond doubt that improved glycaemic control reduced the risk of microvascular complications [2], reported its findings in 1993. It would be a sad reflection on the art and science of diabetes care if we had not moved forwards since then.

In this month's *Diabetologia*, Sämann and colleagues report on the German experience with a programme of structured diabetes education for those with type 1 diabetes, a programme that has consistently reported improved glycaemic control in conjunction with a reduced risk of severe hypoglycaemia [3]. The report is the latest in a series dating back to 1983, all reporting the same outcome [4]. Why does the German programme succeed where the DCCT and other early programmes of intensive insulin therapy fail? And how much more evidence will be needed before all people with type 1 diabetes are offered a similar experience?

The German Diabetes Training and Treatment Programme was started in Düsseldorf by the late Michael Berger and his colleagues. It was – and is – a 5-day programme with a carefully constructed curriculum that aims to teach people with diabetes exactly how insulin works, using well-documented physiological and pharmacological



Michael Berger

data [5]. It was designed to transfer skills of insulin manipulation and dose adjustment to the patient, using recognised principles of adult learning. It provides the tools for self-assessment and, at least initially, a safe environment in which to experiment, to test the principles being taught, and to define what works best for each individual. From the outset, the programme was designed with a quality control system that has allowed it to spread without dilution from one [6] to 96 diabetes centres in Germany and that, as this report testifies, continues to succeed [3].

The DTTP teaches flexible insulin usage around a flexible lifestyle. In other words, it fits insulin around the life the patient wants to lead. This was anathema to many diabetes physicians, who believed that lifestyle therapies and prescriptive dietary recommendations were the sine qua non of good diabetes control. Berger argued otherwise. Without denying the importance of healthy living as a protection against cardiovascular disease, he recognised that the rationale for dietary restriction was the inadequacy of conventional insulin regimens [7]. 'Type 1 diabetes', he said, 'is an insulin deficiency disease.' It follows that, if we could learn to use insulin optimally, we could restore choice to the person with type 1 diabetes. He and his colleagues set out to achieve just this.

You don't have to be German to achieve success with this regimen. A DTTP programme was successfully implemented in Austria some years ago [8] and the UK has finally caught up, publishing its successful pilot Dose Ad-

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justment for Normal Eating (DAFNE) programme in 2002 [9]. DAFNE was a direct translation of the Düsseldorf programme, which allowed for some cultural differences in food preferences and lifestyles and used a 5-day outpatient rather than inpatient programme, but otherwise permitted no deviation from the German curriculum. The impact of the programme upon quality of life was very positive.

Critics have commented upon the labour-intensive nature of a 5-day programme, and others have set out to implement some of its principles in less structured or intense programmes. There is sense in this, but also a potential problem – no one is really sure which component of the DPPT programme is responsible for its success. Does this lie in the separation of basal from prandial insulin replacement? The use of carbohydrate counting to assess meal insulin requirements? The algorithms for dose adjustment? Or is it the interaction of eight people with type 1 diabetes and a highly trained DPPT educator that matters? All new programmes must demonstrate, as rigorously as DPPT has done, that different methods can achieve the same (or better) results; they will also need to create the same rigour of quality control and assessment. As one British doctor put it: ‘It would be typical of us to assume that we can achieve in 2 days what takes the Germans 5.’ Much as we might all wish to achieve more with less, care needs to be taken. Sustained success is likely to depend on maintained standards and critical appraisal, such as that described in the Sämann paper [3]. The UK’s National Institute for Clinical Excellence has recognised this in its recent guidelines for education standards expected of UK diabetes services in future [10].

It is important to note that the success of DPPT and its offspring has been achieved with conventional insulins. Current programmes, which do allow for change in a cautious and audited way, are developing algorithms to maximise the benefits of newer insulin analogues. In an era when exciting new treatments for diabetes are emerging so rapidly, and are marketed with all the vigour and efficiency of which the 21st century is sometimes capable, it is salutary to recall that we can attain such good results using tried, tested and familiar insulins.

Unanswered questions remain. Although the DPPT does not exclude people who have problems with hypoglycaemia, it will be important to show benefit in those with marked hypoglycaemia unawareness and recurrent severe episodes. The issue of on-going education also needs to be addressed – it is a well established principle of adult education that reinforcement and continuous learning are important to sustained success. There is some evidence that drift occurs in DPPT after 3–6 years, and drift was seen at 1 year in DAFNE in the absence of on-going support. And what of the patient who does not want to commit to the rigours of the programme long-term?

Finally, what of cost? Intensive 5-day programmes of small group education are costly for the service in terms of educator time, and no less so for the patients. Based on the reduction in complications expected as a consequence of the improved control from DPPT itself and the Austrian and UK experience, it was, however, estimated that the programme covered its costs, including the costs of educator training and quality control, within about 4 years, and was saving money at 10 [11]. When health care providers ask if they can afford to implement DPPT programmes for their type 1 patients, the answer must surely be that they cannot afford not to. The same may be true for our patients.

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