ACTA BIO MEDICA 2003; 74; Suppl. 1: 41-44 © MATTIOLI 1885

CONFERENCE REPORT

Home Care for Diabetic Children: Keeping Children out of Hospital

Giancarlo Cerasoli, Morena Zondini, Mauro Pococco*

Department of Paediatrics, M. Bufalini Hospital, Cesena, Italy; [1]Department of Maternal and Infant Health, Cesena, Italy

Abstract. This article examines how home care for diabetic children resident in the Azienda Sanitaria Locale (Local Health Centre) of Cesena is organised. It outlines the tasks the Diabetes Health Visitor Nurse carries out, the times and ways of execution, and the methods for analysing the effectiveness of the service. Finally, some of the results achieved through the activation of this new service have been included, among which the fact that the average number of days a child is kept in hospital at the clinical onset of diabetes has dropped from 10 to 5.

Key words: Home care, children, nurse, type 1 diabetes mellitus

Introduction

Non-hospital assistance has an extremely important role in the organisation of care for patients with chronic pathologies. In the case of a child with diabetes mellitus, management of the self-control and therapy concentrates necessarily on the patient and his or her family, rather than on the hospital structure. In order to ensure this management is as effective as possible, it is necessary that, right from the clinical onset of the diabetes, both the patient and his or her family are supported by experts who provide their qualified help not only in hospital but also at the patient's home. In fact, if well-organised, home care for children with diabetes has proved itself to be a method which achieves considerable improvements in the care of children with type 1 diabetes mellitus (1-3). This article describes how the home care for children with diabetes set up by the Azienda Sanitaria Locale (ASL) of Cesena from 1994 to 2002 was organised, and presents some of the results achieved.

Materials and Methods

Cesena is a small town in the region of Emilia-Romagna, whose main economic resource is agriculture. On the 31st December 2001, 185,000 inhabitants were being served by the ASL of Cesena, 28,000 of whom were between 0 and 17 years. 93% of children from 0 to 14 years old were registered with 26 Primary Paediatricians, (PP), 2 Community Paediatricians (CP) and 9 Health Visitor Nurses (HVN). Hospital assistance is provided by the Department of Paediatrics, formed of 11 Hospital Paediatricians (HP). The staff of both the hospital and non-hospital paediatric services have been working together for many years, also caring for children with chronic pathologies.

From the epidemiological point of view, the incidence of type 1 diabetes mellitus in the ASL of Cesena from 1990 to 2002 oscillated annually between 7 and 8 per 100,000 children aged between 0 and 14 years, on a par with the averages registered for central Italy.

Since 1994, the paediatric staff specialising in the treatment of diabetics has been formed of a specialised

hospital paediatrician, a Diabetes Health Visitor Nurse (DHVN) who is a component of the community paediatric system, two nurses from the Paediatric Department day-hospital, a hospital dietician and a psychologist for the Paediatric Department.

Home care is carried out by the DHVN, who is the link between the hospital and the territory. She takes on a child affected with diabetes and his or her family right from the first time the child is admitted to hospital, when the clinical onset of the illness occurs, and continues her work in educating the family about what it means to treat a child with diabetes at home, as well as in day-hospitals, schools and during educational-therapeutic sessions.

At the onset of the illness the child is hospitalised, and the health education survival plan put into practice. It consists in 20 hours of interactive meetings between staff and the family of the child who has been admitted to hospital. The DHVN has 5 hours at her disposal during which she teaches the family how to control the levels of glycaemia and glycosuria, how to inject insulin correctly and how to fill out the diary. During this extremely delicate phase, the DHVN works in close contact with the other members of the diabetic staff, and develops relations with the patient's PP as well as the CP who deals with the school he or she attends. In this way, she tries to ensure that the child returns quickly and safely both home and to school. In hospital, the DHVN organises the educational work at a practical level, by explaining how to carry out the necessary operations concerning the self-control and insulin injections. This means that those members of the family who wish to, will have both the minimum skills necessary for carrying out these tasks correctly, and to encourage the independence of the patient.

When the child is discharged from hospital, the DHVN visits him or her at home in order to help the family carry out both the self-control and insulin therapy correctly. She provides them with precious information about how to organise the areas within the home and the time dedicated to carrying out these practices. She explains how and where to create the family pharmacy and to keep everything necessary for dealing with hypoglycaemia, including glucagons.

After the child has been dismissed from hospital, the DHVN visits the child at home every week for the first month, every fortnight for the second month, and every two months from the third to the sixth month. For those patients who have been in her care for at least a year, the DHVN visits the patient at home every six months or more frequently if she discovers any incorrectness with the family management, or if the patient has any particular needs.

The DHVN's main task is to advise and guide both the patient and his or her family in learning about and treating diabetes and, in the process, try and increase their self-confidence and ensure they manage the illness safely. She helps the patient to organise the self-control and therapy correctly, both at home and elsewhere, at school, for example, or in the gym. She reinforces the information the dietician has given the family about what the child should be eating, and teaches the family to use the lists of foods which contain similar quantities of carbohydrates to provide him or her with a more varied diet. She provides the family with information about the various sports activities which are available for children in and around the area, and tell them how they can participate, indicating those sports which are more suitable for a child with diabetes.

Before visiting any family, she arranges the date and time in order to ensure that, apart from the child, most of the family members who are involved in caring for him or her are present, too. If the patient has any particular difficulties, before actually visiting the family, the DHVN can call a meeting of the diabetic staff in order to focus on the dynamics of the family and to set out a more detailed plan of intervention.

During her visit, the DHVN evaluates different elements concerning how the diabetes is managed. In particular, she examines the presence and suitability of the materials used for the self-control and the insulin therapy, the correct execution of the capillary glycaemia, the insulin injection and how the diary is kept, and if the rules fixed by the dietician are being respected. She obtains useful information about how satisfied the family is with the PP, the diabetic staff and the staff at the school the child attends. She also inquires as to the safety levels if there should be the need to deal with hypoglycaemia or any other emergency tied to diabetes. She supplies detailed informa-

tion about topics which, during the visit, the family seem to know little about.

If she needs to ask the other members of the diabetic staff for advice, she can contact them, by phone, actually during the visit, in order to fix further meetings and set up more in-depth studies. If the child is very young, or if it is difficult for the family to bring him or her to hospital, she can carry out the haemoglobin glycosilate test actually at their home, using a DCA 2000 Bayer.

After the visit, the DHVN fills out a specific questionnaire which lists the various elements she investigated and how well they are being carried out within the family environment. She also writes a report for the child's PP and the diabetic staff in which she highlights the problems she came across during her visit. At intervals, she checks these reports, and evaluates the results achieved by the alterations made to the situation.

Results

During the eight year period in which this service has been running, the work of the DHVN, who forms part of the diabetic team, has contributed greatly to achieving a number of important objectives.

First and foremost, the continuity of the health education the DHVN carries out helps to limit the period the child is kept in hospital to a very minimum, basically the period necessary in order to rebalance his or her metabolism and set up an effective treatment programme (to include the doses of insulin, the child's diet and psychological help, etc.), which is continued once the child leaves hospital. The average time of hospitalisation at the onset of illness has dropped from 10 days during the period from 1991 to 1993, to just 5 days between 1994 and 2002. During these last eight years, none of the newly diagnosed children have needed to return to hospital a second time for diabetes related problems.

Through the work of the DHVN, it has been possible to achieve better knowledge concerning the real problems of those families in which a child suffers from diabetes. This has meant it has been possible to start up a number of corrective measures which involve both the hospital and territorial assistance services. As she is well-aware of all the resources and assistance available in the area, the DHVN is able to guide families both safely and competently in using them. In this way it was possible, for example, to mobilise the school service and, within a 7 day average from the child's being discharged from hospital, reinsert young diabetics guided by the health staff (DHVN, CP, PP) who train teachers in how to deal with the most frequent problems linked to the illness.

The fact that the DHVN is able to develop a relationship with the families means she can work more closely with them, and increase their self-confidence. For the families, in fact, while the doctor is essentially a judge who imparts rules and makes judgements, the DHVN and the nurses are considered to be advisors and allies, as it were, from whom it is possible to obtain practical suggestions for living with diabetes.

During her work, the DHVN often solves problems, by providing families with information. She also teaches them how to deal with various situations which actually happen to the patient, in order to demonstrate how to solve difficult situations in the best way possible. This has enabled many patients to improve the way they solve daily problems linked with diabetes and their metabolic control, thus reducing visits to hospital and absence from school to a bare minimum. The most frequent problems the DHVN has come across during her work are, mistakes made in carrying out the self-control, incorrect maintenance of the reflectometer, errors made during the preparation and injection of insulin, insulin and glucagons being kept incorrectly, the lack of identification cards or glucagons, and that the dietary rules set down by the dietician are not followed.

Discussion

Home care for diabetic children may be an important resource for improving the quality of the assistance they receive (4-5). One of the most obvious results of setting up this service is the drastic reduction in the recovery period when the clinical onset of the illness occurs. Studies have demonstrated that a short, but well-organised, stay in hospital, followed by home

care, is more effective than a longer stay in hospital. This is because it achieves both a quicker and better metabolic balance, and the psycho-social adaptation of the young diabetics, as well as reducing long-term complications. Besides this, social costs are lower, too (6-11). There is also proof that health education carried out directly at home can significantly improve both children's and adolescents' knowledge about diabetes and their approach to dealing with it more effectively (12).

For these reasons, the consensus guidelines issued by the International Society for Paediatric and Adolescent Diabetes indicate that, if there is a territorial service which is able to offer home care to families with diabetes and a 24 hour consultation service is available and offered by an expert in this field who is part of a diabetic equip, it is possible and indeed advisable that outpatient or home-based treatment for children with the onset of diabetes, which presents no serious ketoacidosis (13) is given.

In Italy, treatment for children is provided by the National Health Service, the quality of which differs greatly from one area to another. While the paediatric service in hospitals is well distributed over the entire national territory, it often happens that the service offered by PP does not include all residents aged 0 to 14 years, and that the diffusion of the services offered by HCP is even less widespread. Wherever there are efficient, integrated hospital and non-hospital paediatric services it is possible to care for children more thoroughly, especially those affected with chronic pathologies (14).

In the case of Cesena, the involvement of a DHVN from the Community Paediatric service within a paediatric diabetic equip, has made it possible to set up a home care service, which has contributed significantly to improving the health of children with diabetes.

References

1. Vanelli M. L'assistenza domiciliare al bambino diabetico. *Rivista Italiana di Pediatria* 1993; 19: 380-3.
2. Vanelli M. L'assistenza domiciliare al bambino diabetico. Bilancio di un'esperienza pilota in Italia. *Rivista Italiana di Pediatria* 1992; 18: 275-9.
3. Vanelli M. Il bambino con diabete tra pediatria ospedaliera, pediatria di base e pediatria di comunità. In: Viola P e Benaglia G, Argomenti di pediatria preventiva e sociale. Parma, 1993: 37-9.
4. McEvilly A. Liason nursing – the diabetic home care team. In: Kelnar CJ, Childhood and Adolescent Diabetes. Chapman e Hall Medical Ed., London, 1995: 465-73.
5. Cowan FJ, Warner JT, Lowes LM, Riberio JP, Gregory JW. Auditing paediatrics diabetes care and the impact of a specialist nurse trained in paediatric diabetes. *Arch Dis Child* 1997; 77 (2): 109-14.
6. Simmel T, Moren T, Keltikangas-Jarvinen L, Hakalax J, Simell O. Short-term and long-term initial stay in hospital of children with insulin-dependent diabetes: adjustment of families after two years. *Acta Paediatr* 1995; 84: 41-50.
7. Swift PGF, Hearnshaw JR, Botha JL, Wright G, Raymond NT, Jamieson KF. A decade of diabetes: keeping children out of hospital. *BMJ* 1993; 307: 96-8.
8. Lessing DN, Swift PGF, Metcalfe MA, Baum JD. Newly diagnosed diabetes: a study of parental satisfaction. *Arch Dis Child* 1992; 67: 1011-3.
9. Dougherty GE, Soderstrom L, Schiffrin A: An economic evaluation of home care for children with newly diagnosed diabetes. Results from a randomized controlled trial. *Medical Care* 1998; 36: 586-98.
10. McNally PG, Burden AC, Swift PGF, WallsJ, Hearnshaw IR. The prevalence and risk factors associated with the onset of diabetic nephropathy in juvenile-onset (insulin-dependent) diabetics diagnosed under the age of 17 years in Leicestershire 1930-1985. *Q J Med* 1990; 76: 831-44.
11. Cavan DA, Hamilton P, Everett J, Kerr D. Reducing hospital inpatient length of stay for patients with diabetes. *Diabet Med* 2001; 18: 162-4.
12. Task Force on Community Preventive Services. Raccomandations for Healthcare System and Self-Management Education Interventions to Reduce Morbidity and Mortality from Diabetes. *Am J Prev Med* 2002; 22 (4s): 10-14.
13. International Society for pediatric and adolescent diabetes. Consensus Guidelines 2000 for the management of type 1 Diabetes Mellitus in children and adolescent, Medical Forum International Ed., Zeits, Netherlands, 2000; 30-115.
14. Associazione Culturale Pediatri, Servizi sanitari per l'età evolutiva. Grafica 2000, Padova, 1998.

Received: 4 March 2003
Accepted in original form: 28 March 2003
Correspondence: Dr. Giancarlo Cerasoli
Division of Pediatrics, M. Bufalini Hospital
Via G. Ghirotti 246,
47023, Cesena, Itay