

The Wessex Starting Insulin Study: practicalities of initiating insulin

Jill Rodgers

ARTICLE POINTS

- 1 The delivery system used for initiation of insulin therapy varied according to the type of patient.
- 2 Daily starting doses of insulin in both adult groups (type 1 and type 2 diabetes) were similar.
- 3 The majority of patients in the study self-administered their first injection of insulin.
- 4 All of the children studied were admitted to hospital to commence insulin, whereas most adults were seen at home or in an outpatient setting.
- 5 Not all patients were offered a choice of insulin delivery system.
- 6 When offered a choice, the majority of patients preferred pen devices to syringes.

KEY WORDS

- Starting insulin
- Delivery systems
- Choices
- DSN practice

Jill Rodgers is Diabetes Specialist Nurse (Primary Care) at Queen Alexandra Hospital, Portsmouth.

Introduction

The second part of this three-part series outlining a study of current practice when initiating insulin looks at the practical aspects, including which insulin, delivery system, starting dose and regimen were used for the people studied. Additional factors such as whether insulins were mixed by the patient, whether tablets were used alongside insulin in adults with type 2 diabetes, and what influenced health professionals and patients when making these choices at different stages of this process are also investigated.

The first article in this three-part series (Rodgers, 1998) described the aims and design of the Wessex Starting Insulin Study, which gathered information on the practice of diabetes specialist nurses (DSNs) when initiating insulin therapy. Questionnaires were distributed to DSNs in Wessex in Spring 1997; 111 returned completed questionnaires, giving a response rate of 50.5%. The answers were analysed according to the three main types of patients seen: children with diabetes; adults with type 1 diabetes; and adults with type 2 diabetes.

Part one identified the decision makers at various stages of initiation of insulin therapy, including which areas were commonly dealt with by doctors, which were dealt with by DSNs, and which decisions involved patients or carers. Part two looks at the choices made in relation to a number of practical aspects of initiating insulin therapy.

Equipment and insulin

The choice of delivery system, type of insulin and regimen are outlined in *Table 1*. Syringes were used by the majority of children, closely followed by durable pens. The majority of adults with type 1 diabetes used durable pens, with some using syringes. Only one person in each of these groups used disposable pens.

A different picture was seen in adults with type 2 diabetes: the majority used durable pens, but 16 (23.9%) used disposable pens, and 10 (14.9%) used syringes.

These findings suggest that delivery systems are chosen according to the type of client group. The greater use of disposable pens in adults with type 2 diabetes may reflect the larger doses of insulin often required by this group. At the time of the study, the only durable pens available delivered relatively small doses of insulin, unlike those available today. It is interesting that syringes were still used to start insulin in at least 14% of patients in all categories. Reasons for choice, and the factors limiting choice, are discussed later.

None of the patients studied were asked to mix their insulins. In all categories of patient, premixed insulin was the most common form of insulin used. The type of mixture was not specified by all respondents, but those who did, identified this as 20/80 or 30/70. The majority of patients (>60% in all categories) used a twice-daily regimen.

Soluble insulin only was used in 33.3% of children with diabetes, mainly with a three times daily regimen, but was not used at all in either of the adult groups. A four times daily regimen was used in only one person in each group.

In both adult groups, isophane only was the second most common insulin regimen. A once-daily dose was used in 30.8% of adults with type 1 diabetes, and in 23.9% of adults with type 2 diabetes if both morning and evening daily doses are included.

When asked whether they used tablets alongside insulin in adults with type 2

diabetes, 28% of DSNs responded positively; the majority of these patients were taking once-daily insulin.

Insulin starting doses

The doses of insulin used from the outset, although not specified by all respondents, are shown in Table 2. The majority of paediatric doses were related to body weight. In adults with type 1 diabetes, the range was skewed by one patient being commenced on a twice-daily regimen with 60 units in the morning and 30 units in the evening, although no explanation was given as to why such a large dose was used. When this patient is excluded, the total dose varied from 8 to 20 units in adults

with type 1 diabetes and from 8 to 26 units in adults with type 2 diabetes. A greater variation was seen in the four-times daily regimen, although this was rarely used.

First injection: who, where and why

In all three categories of patients, there were similarities in practice regarding who gave the first injection (Table 3). In children, 33.3% administered their own insulin and in 40.7% of cases a relative gave the injection, possibly because of the age of the child. In adults with type 1 diabetes, 84.6% injected their own insulin, as did 84.8% of adults with type 2 diabetes, and in the latter group 6.1% of relatives gave the injection.

Table 1. Insulin delivery system, type and regimen used

	Children with diabetes (n = 27)	Adults with type 1 diabetes (n = 13)	Adults with type 2 diabetes (n = 67)
Insulin delivery system:			
Syringe	14 (51.9%)	3 (23.1%)	10 (14.9%)
Durable pen	11 (40.7%)	9 (69.2%)	41 (61.2%)
Disposable pen	1 (3.7%)	1 (7.7%)	16 (23.9%)
Durable pen and syringe	1 (3.7%)	0 (0%)	0 (0%)
Type of insulin:			
Isophane only	3 (11.1%)	4 (30.8%)	17 (25.4%)
Soluble only	9 (33.3%)	0 (0%)	0 (0%)
Premixed	15 (55.5%)	8 (61.5%)	49 (73.1%)
Isophane and soluble at different times	0 (0%)	1 (7.7%)	1 (1.5%)
Regimen used:			
Once daily in the morning	1 (3.7%)	4 (30.8%)	11 (16.4%)
Once daily in the evening	0 (0%)	0 (0%)	5 (7.5%)
Twice daily	17 (63.0%)	8 (61.5%)	50 (74.6%)
Three times daily	8 (29.6%)	0 (0%)	0 (0%)
Four times daily	1 (3.7%)	1 (7.7%)	1 (1.5%)

Table 2. Starting dose of insulin (international units)

	Children with diabetes (n = 27)	Adults with type 1 diabetes (n = 13)	Adults with type 2 diabetes (n = 67)
Daily (morning):	range of total daily dose	5	10–20
Daily (evening):	range of total daily dose	n/a	n/a
Twice daily:	range am	1–18*	4–60
	range pm	1–9*	4–30
	range of total daily dose	2–27*	8–90
Three times daily:	total dose	0.5/kg/day	n/a
Four times daily:	total dose	20	16

*In 12 children, dose was related to body weight; n/a = not applicable

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1 One third of the children in the study self-administered their first insulin injection.

2 All of the children received their first insulin injection in the ward environment.

3 Two-thirds of adults with type 1 diabetes received their first insulin injection in an outpatient setting.

The insulin injection was therefore given by either the person with diabetes or a relative, and not by health professionals, in 74–90% of cases, depending on the category. Where health professionals were involved, these included doctors, DSNs, district nurses and ward nurses, depending on the circumstances.

The first injection for all children was given in a ward environment, reflecting the common practice of admitting newly diagnosed children with diabetes to hospital. Some adults with type 1 diabetes were admitted, but the majority (61.6%) were dealt with in an outpatient setting, which varied according to the local facilities. Of this group, 15.4% had their first insulin injection in their home environment. Only one adult with type 2 diabetes was an inpatient when starting insulin; the remainder were equally divided between an outpatient setting and their home environment.

Table 3 also lists the reasons given by

DSNs for choice of venue in the adult groups. ‘Convenience’ was the most common reason given for both home and outpatient settings, and patient choice was also identified. ‘Usual practice’ and ‘cost-effective’ were also cited as reasons for choosing an outpatient venue, while home visiting was sometimes seen as more appropriate for the patient; comments of ‘nicer’ or ‘better with husband and dog’ were also given!

These findings suggest that the choice of venue depended more on professional judgment as to the most appropriate, than on whether or not better outcomes might be obtained. Further study is required regarding: the cost implications of different venues; whether starting insulin in different settings makes a difference; and what would cause DSNs to vary their choice of venue.

Choice when starting insulin

DSNs often claim that ‘patient choice’ is an important factor in their decision making.

Table 3. First injection: who, where and why

	Children with diabetes (n = 27)	Adults with type 1 diabetes (n = 13)	Adults with type 2 diabetes (n = 67)
Who gave first injection:			
Doctor	1 (3.7%)	0 (0%)	1 (1.5%)
Ward nurse	6 (22.2%)	1 (7.7%)	1 (1.5%)
DSN	0 (0%)	1 (7.7%)	2 (3.0%)
District nurse	0 (0%)	0 (0%)	2 (3.0%)
Patient	9 (33.3%)	11 (84.6%)	56 (83.6%)
Relative	11 (40.7%)	0 (0%)	4 (6%)
Not stated	0 (0%)	0 (0%)	1 (1.5%)
Location for first injection:			
Ward	27 (100%)	3 (23.1%)	1 (1.5%)
Outpatient setting*	0 (0%)	8 (61.6%)	33 (49.3%)
Home	0 (0%)	2 (15.4%)	33 (49.3%)
Reasons for choosing outpatient venue:			
Convenience	n/a	6	15
Usual practice	n/a	1	12
Cost-effective	n/a	0	3
Patient choice	n/a	1	2
Not stated	n/a	0	1
Reasons for choosing home venue:			
Convenience	n/a	2	18
Patient choice	n/a	0	3
Immobility	n/a	0	5
Appropriate for patient	n/a	0	5
Nicer	n/a	0	1
Better with husband and dog	n/a	0	1

*Outpatient setting includes diabetes centre, outpatient department and DSN office

To find out how far patients were involved in making choices about initiation of insulin therapy, a number of questions specifically asked about patient choice. One asked DSNs their reasons for choosing a particular delivery system. Syringes were used for a variety of reasons: in some cases they were used routinely before giving patients a choice at a later stage (Table 4).

The main reason given in paediatric care for choosing a syringe was 'ease of use' (n=9); a similar number of respondents gave this as the reason for using a durable pen (n=8). In adults with type 2 diabetes, devices were sometimes chosen according

to patient ability, and sometimes for practical reasons, such as the cost of pen needles or the large dose of insulin required.

Overall, patient choice was the reason for selecting a particular delivery system in only 1 case (3.7%) in children, in 8 (61.5%) cases in adults with type 1 diabetes, and in 36 (53.8%) cases in adults with type 2 diabetes. Where choice was given, durable pens were preferred by most, followed by disposable pens; very few chose syringes.

Another question asked what factors limited the ability to give people a choice about their delivery system, their insulin regimen or the type of insulin used. Responses

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1 DSNs often claim that patient choice is an important factor in their decision making.

2 There was little evidence of patient choice in decisions about the delivery system for children with diabetes.

3 Approximately half of the adults in both groups were allowed the choice of insulin delivery system.

4 Most adults with diabetes chose durable or disposable pens when given the choice.

Table 4. Reasons for choice of delivery system

	Children with diabetes (n=27)	Adults with type 1 diabetes (n=13)	Adults with type 2 diabetes (n=67)
Syringe:			
Ease of use	9	0	2
In hospital and available	2	0	1
To teach drawing up	1	0	0
Initial use, choice later	2	2	2
Cost of pen needles	0	0	2
Patient choice	0	1	2
Durable pen:			
Ease of use	8	2	7
Used for all	2	0	0
Limited patient ability	0	0	6
Patient choice	1	7	24
Cheapest pen system	0	0	5
Disposable pen:			
Ease of use	1	0	3
Limited patient ability	0	0	1
Large doses	0	1	2
Patient choice	0	0	10
Durable pen and syringe:			
Ease of use	1	0	0

Table 5. Factors limiting patient choice of insulin, regimen or delivery system

	Children with diabetes (n=27)	Adults with type 1 diabetes (n=13)	Adults with type 2 diabetes (n=67)
Choice not limited	11	8	30
Consultant decision	0	0	7
Protocol	8	1	3
DSN choice for simplicity	0	2	6
Patient lack of awareness	0	1	14
Patient ability	0	0	1
Other	2	0	5
Not specified	6	1	1

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1 Variation was evident in every aspect of DSN practice regarding initiation of insulin therapy.

2 At present, there is insufficient evidence to judge whether any one method of practice is superior to another.

3 Further research is needed to determine which factors influence DSNs' decision making when starting patients on insulin.

4 Without knowledge of these factors, DSNs are in danger of providing differing standards of care to people with diabetes.

5 Only by addressing this inequity can DSNs be confident that they are providing optimal care for all of their patients.

show that for a high proportion of patients in all categories it was not necessary to limit choice (Table 5). Where limitations existed, these were governed in some cases by protocols or consultants making the decisions. Another reason was 'for simplicity'; and in 14 type 2 adults, it was considered that these patients had insufficient knowledge to make choices at that stage.

Clearly, further research as to why some patients were given a choice of delivery systems and others were not is needed. The variation in practice between DSNs may be related to individual patient characteristics, or may be determined by whether the DSN feels that the choice is within her/his area of responsibility rather than the patient's, but it is difficult to speculate without further research.

Discussion

This study has helped to define more closely the practicalities of initiating insulin therapy. In particular, it has identified common patterns of care, e.g. the types of insulin used, common delivery systems in different patient groups, and the venues used for initiation of insulin.

However, variation was apparent in every aspect of care, but this study was too limited to explain this variation in any detail. For example, some information was obtained about why certain delivery systems were chosen, but the factors influencing those decisions were not clear: in what situation was a syringe considered easier to use than a pen device, and vice versa?

Findings suggest that individual qualities of patients are likely to influence the devices chosen, and this area requires further study. Similarly, some patients were involved in the decisions made and others were not. Why did this variation in practice exist? Were there individual patient characteristics which indicated that patients were capable of making choices, and how much influence did the DSN have in whether patients were allowed choice?

Some DSNs felt, particularly in the case of adults with type 2 diabetes, that lack of patient awareness about insulin therapy limited the potential to allow patient choice. However, it is rare to have to start insulin urgently in this group, and so it may be

possible to take things more slowly and to raise awareness and enhance patient choice before initiating insulin.

Another limitation was that the reasons for the use of different insulin regimens, and different types of insulin, were not explored. The choice of insulin is likely to be closely linked to the choice of regimen, because of the different times of action of insulin preparations.

The most common regimen was premixed, twice-daily insulin; other regimens and types of insulin were used for a number of patients in each group. Again, the decisions made may relate to the needs of individual patients, but the reasons for these choices require further study.

Conclusions

This study has provided considerable information about the practice of DSNs when initiating insulin, and has identified a number of areas where further study is required, including the effect of starting insulin in different venues, the use of different insulins and regimens, and the appropriateness of different delivery systems.

DSNs are likely to base their decision making on existing knowledge, experience, usual local practice and individual patient assessment, and further study of these influences would help to reveal how expertise is applied in this complex area of care. We do not currently have sufficient evidence to judge whether one method of practice is superior to another, and the variation in care identified here may or may not be related to the clinical judgments being made.

Until we can adequately describe the process whereby these decisions are reached, we are in danger of providing potentially differing standards of care to people with diabetes, and this inequity needs to be addressed. If we can add to our knowledge base in this area, we can be more confident that we really are doing the best for our patients.

Part 3 of this study, to be published in the next issue of *Journal of Diabetes Nursing*, will provide information on the type of follow-up received by patients in the first month of insulin therapy. ■

Rodgers J (1998) The Wessex Starting Insulin Study: methodology and decision making. *Journal of Diabetes Nursing* 2(6): 183-6