Does glycaemic control improve in adults with Type 1 diabetes after attending CarbAware, a novel, 3 hour, structured education course?

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ABCD Autumn Meeting 10th November 2016

Education and type 1 diabetes

- Structured education (SE) is recommended by NICE since 2003
- DAFNE (dose-adjustment for normal eating) programme:
  - Improved long-term glycaemic control
  - Reduced hypoglycaemia
  - Improved quality of life
- NICE 2015

DAFNE Study Group BMJ 2002, Gunn *et al* Diabetic Medicine 2012

Most type 1 diabetes (T1D) patients do not attend structured education

- NDA 2013-2014 and 2014-2015:
  - 32% T1D patients recorded as being 'offered' SE
  - <2% T1D patients in England attend SE
- Berkshire:
  - ~1700 patients with T1D
  - 32 DAFNE places available annually

HSCIC 2016, APPG for Diabetes 2015

Level Two Structured Education

- All Party Parliamentary Group (APPG) 2015
  - Barriers e.g. location, timing, waiting times
  - Broader, more flexible, patient-centred range of options
- DUK commissioned King's Fund Report
- NICE 2015: Consider carbohydrate-counting courses for adults with T1D (new update)

BolusCal Study

- 16 week randomised, controlled, open-label, three-arm study (51 T1D patients)
- HbA1c 8-10.5%
- Control (n=8) vs. CC (n=21) vs. CC/ABC (n=22)
- 3 hour teaching session
- 0.8% and 0.7% HbA1c drop in CC and CC/ABC arms vs. 0.1% HbA1c drop in Control group

Schmidt *et al* Diabetes Care 2012

CarbAware

- 3 hour group education session
- Industry sponsored (Roche)
- Specialist diabetes dietician

CarbAware

- To introduce/refresh the principles of carbohydrate counting
- To practice how to estimate the carbohydrate content in a range of food and drinks
- To improve understanding of the interaction between diet and insulin
- To use carbohydrate counting to improve diabetes self-management
- To correctly treat a hypoglycaemic episode
- To use the Accu-Chek Aviva Expert bolus advisor meter

Aims

- To audit whether attendance at CarbAware could improve diabetes control in T1D patients

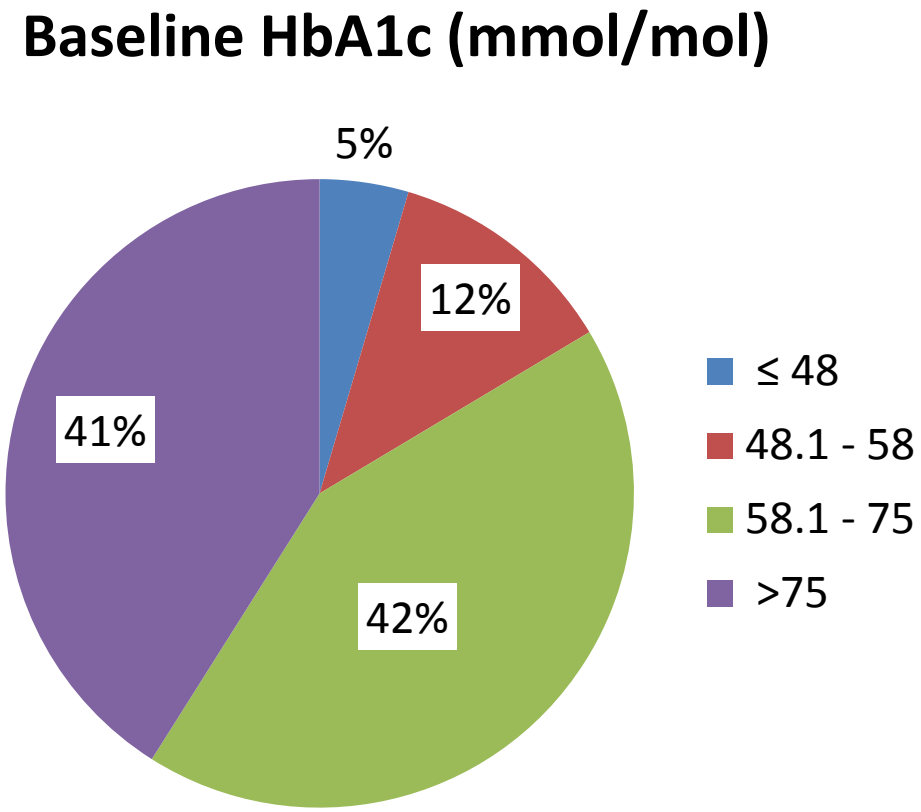
- To audit whether attendance at CarbAware could promote diabetes self-management in T1D patients

Method

- CarbAware attendees from February 2014 and July 2015
- HbA1c at baseline, ≥3 months and ≥ 12 months after CarbAware
- Patient questionnaires of diabetes self-management (before and after CarbAware)

Results: Baseline Characteristics

- 336 CarbAware attendees
- 175 (52%) male
- Median age 44.7 yrs (range 18.5 - 88.4 yrs)
- HbA1c at baseline in 329 patients (98%)
- Mean ± SD HbA1c = 75.4 ± 18.7 mmol/mol



Results: Improved HbA1c

	Baseline	3-12 months	>12 months
All attendees	**75.4** ± 18.7 (n = 329)	**72.4** ± 17.6* (n = 287)	**70.8** ± 16.6* (n = 266)

Data shown as mean ± SD HbA1c (mmol/mol)
n= number of patients
* P<0.05 vs. baseline (paired T-test)

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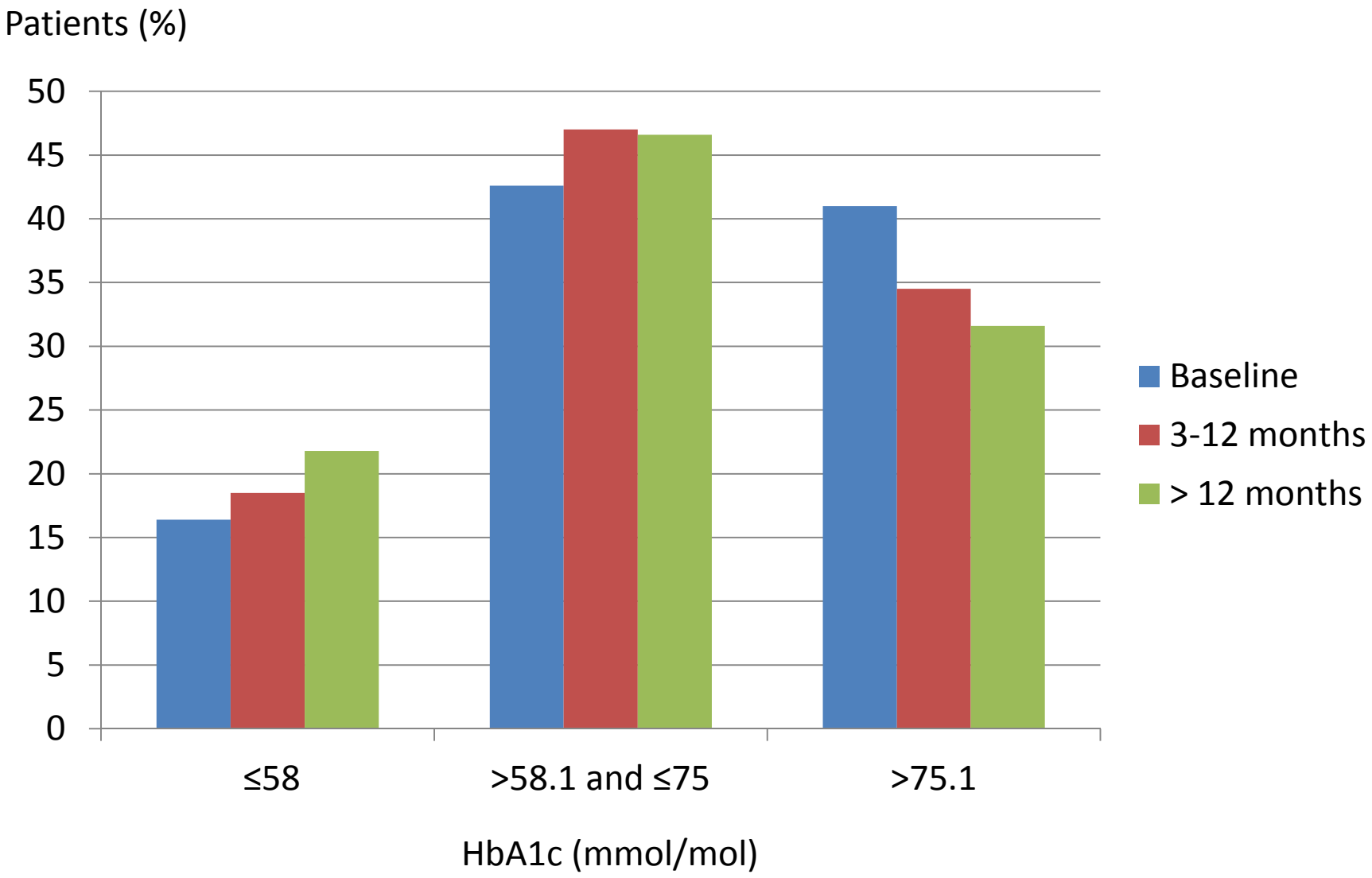
Initial HbA1c ≤58	**52.1** ± 5.0 (n=54)	**55.6** ± 11.0* (n=51)	**56.9** ± 9.5* (n=43)
Initial HbA1c >58 and ≤ 75	**67.6** ± 4.8 (n=140)	**68.6** ± 9.7 (n=119)	**67.3** ± 8.8 (n=117)
Initial HbA1c >75	**92.8** ± 15.4 (n=135)	**83.6** ± 18.8* (n=117)	**80.5** ± 19.6* (n=106)

Data shown as mean ± SD HbA1c (mmol/mol)
n= number of patients
* P<0.05 vs. baseline (paired T-test)

Results: Improved HbA1c



Results: Self-management

Before CarbAware:

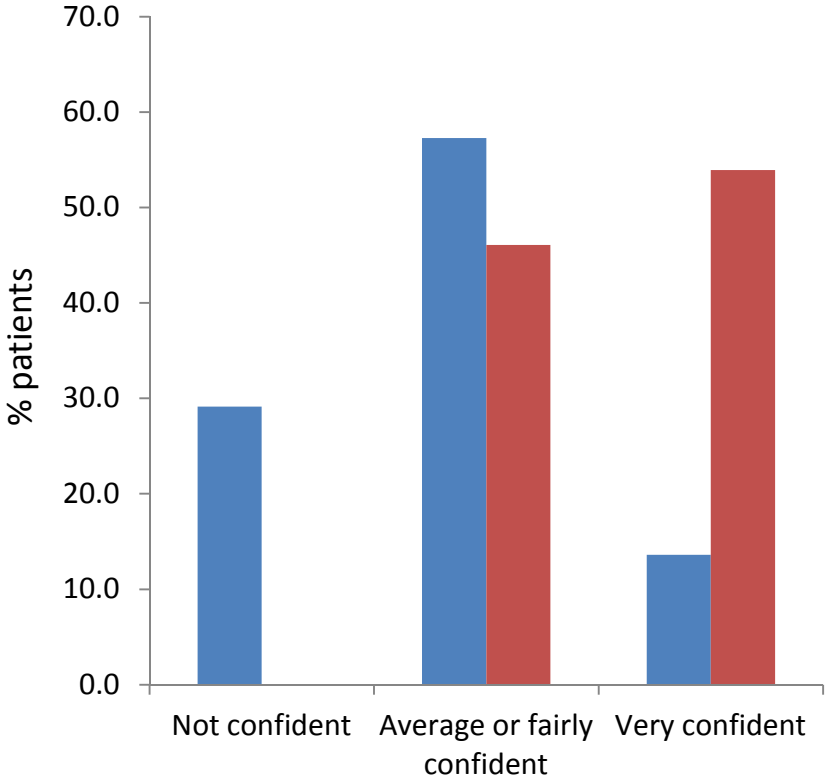
- 12% never adjust insulin doses
- 24% formal carbohydrate counting

After CarbAware:

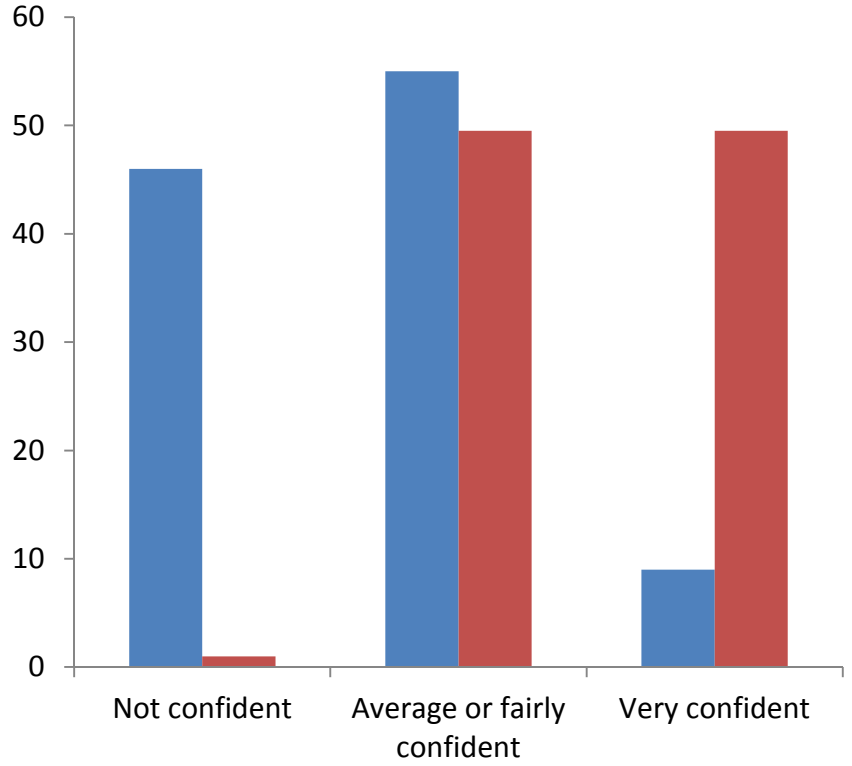
- 45% intend to increase blood sugar monitoring

Results: Improved Confidence

A: Carbohydrate counting using food labels



B: Carbohydrate counting using weights



103 questionnaires

Before

After

Results: Positive Feedback

- “very informative and really useful learning experience”
- “feeling more confident with carb counting”
- “very detailed”
- “very good course”
- “learning went beyond my expectations and updated my knowledge”

Conclusions

- Large numbers of T1D patients can access SE
- Empower patients to make rational daily insulin dose adjustments
- Small and sustained reductions in HbA1c
- Positive attendee feedback

Discussion

- Formalise curriculum
- Apply for QISMET accreditation
- Pre-assessment to optimise basal insulin
- Ongoing patient support (e.g. e-mail, phone)
- Develop CarbAware2 (follow on course) to reiterate self-management principles

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