

Type 1 Diabetes: Less guesswork.
More freedom. Better health.



DAFNE Satellite Symposium:

**Future challenges in Type 1
diabetes: Can structured diabetes
education evolve to meet them?**

Lessons learnt from the National Audit: Identifying and plugging the gaps in DAFNE

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Background

- DAFNE Programme is based upon twice daily NPH insulin for basal insulin replacement
- Basal insulin analogues became available as the DAFNE Programme was being rolled out
- Many patients have been commenced on or switched to basal analogues prior to attending a DAFNE course

Background

- Long acting basal analogues are often taken once daily, with the potential benefits of convenience and adherence
- However, there is lack of flexibility with once daily basal, particularly in patients who exercise
- Most patients (78%) stay on the basal insulin which was being used on the course week

Aims

- To compare glycaemic control (HbA1c) between patients using NPH insulin, Detemir and Glargine at entry and 1 year after attendance on a DAFNE Course
- Other analyses include:
 - once and twice daily basal insulin
 - weight
 - episodes of severe hypoglycaemia
 - hypoglycaemia awareness

Methods

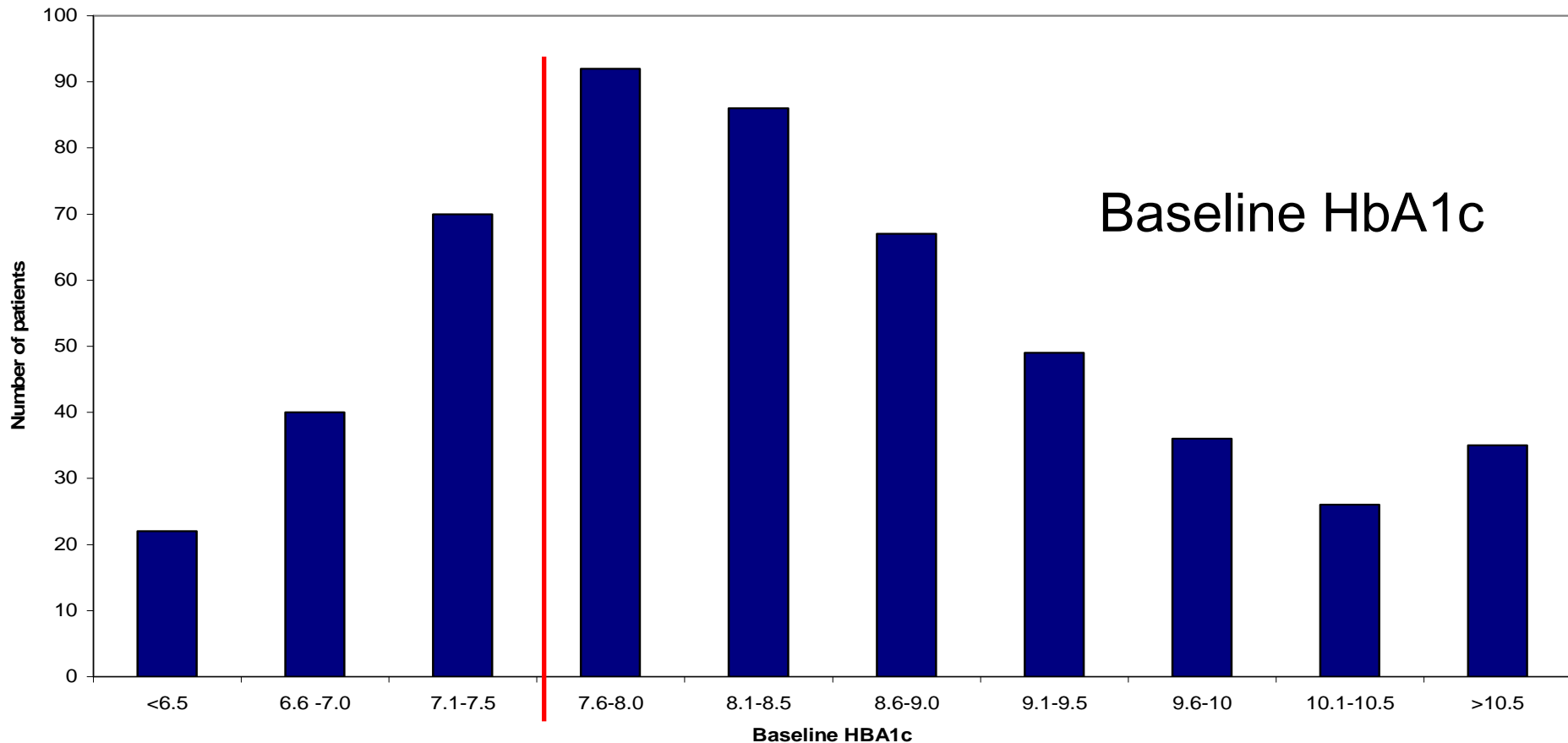
- Central DAFNE Database was interrogated for patients attending a DAFNE Course throughout the UK in 2005 (31 centres)
- Complete datasets were available for 1046 (89.9%) participants at baseline and 607 (52.2%) participants at one year
- Hypoglycaemia awareness divided into aware, impaired and unaware

Baseline Characteristics (n=1163)

- Age 43.3 years
- Females 57.5%
- White European 95.2%
- Duration of T1DM 19.9 years
- Weight 75.5kg

Compared to original DAFNE trial patients had a lower mean baseline HbA1c of 8.46 ± 0.06 %, reflecting inclusion of patients with HbA1c $<7.5\%$

Baseline HbA1c distribution



Changes over 1-year follow-up

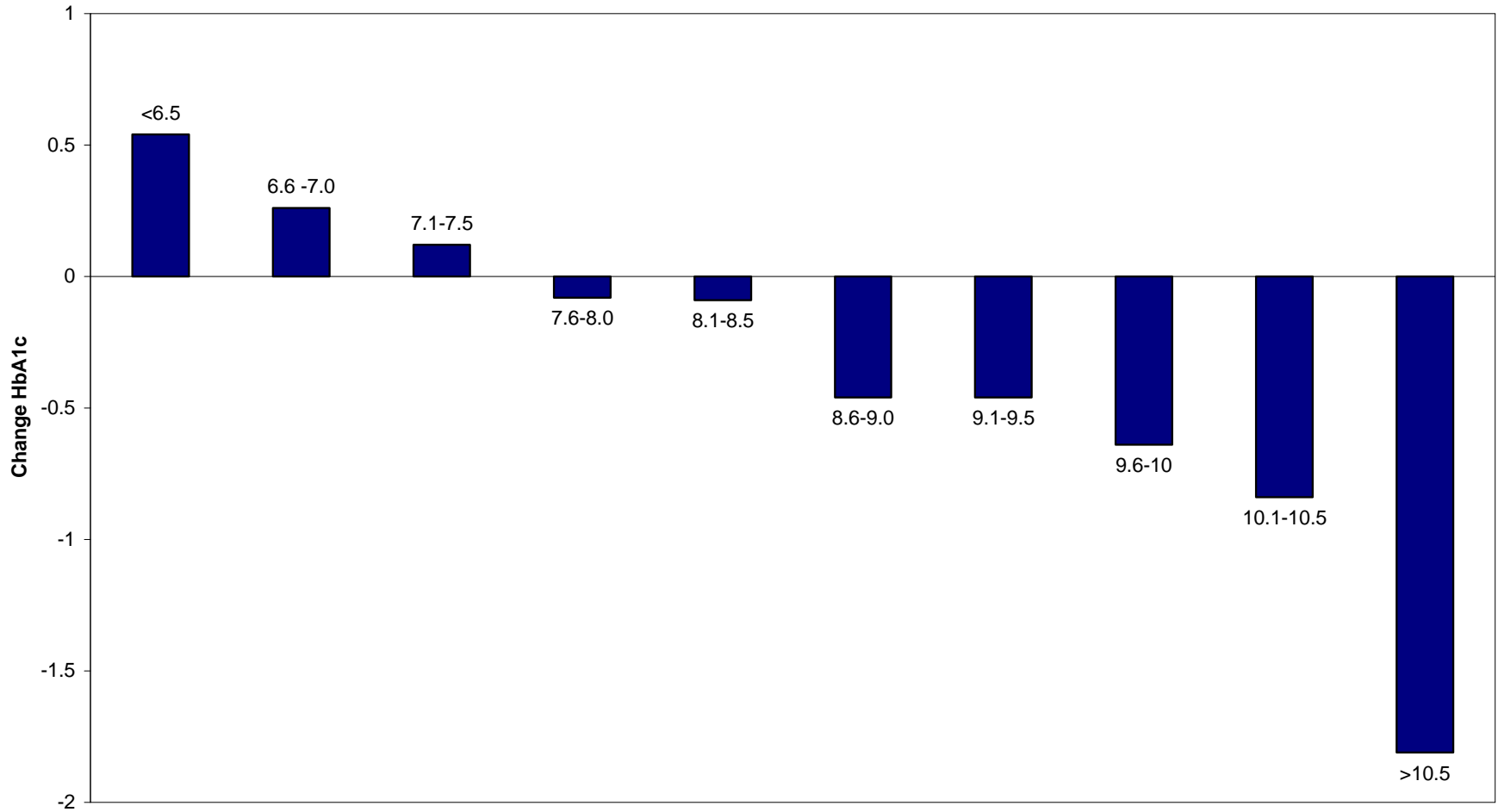
HbA1c

- Mean baseline 8.46 ± 0.06 %
- Mean follow-up 8.18 ± 0.06 %
- Mean Change -0.28% $p = <0.001$

Weight

- Mean baseline 75.3 ± 0.6 kg
- Mean follow-up 75.4 ± 0.7 kg
- Mean Change $+0.1$ kg $p = 0.67$

Mean change according to baseline HbA1c



Among patients with HbA1c > 7.5% (n=396) mean fall = 0.37%
Among patients with HbA1c > 8.5% (n=107) mean fall = 0.76%

Hypoglycaemia

At baseline

- 25.4% experienced SH in year prior to DAFNE, with a mean of 7.8 episodes being reported
- 189 (42%) subjects reported HU at baseline.

After 1 year

- Mean SH rate fell from 7.8 ± 1.6 to 2.2 ± 0.8 episodes/yr ($p < 0.001$)
- 91/ 189 (48%) reported restoration of HA at 1 year

Baseline Characteristics (n=1046)

	Number	%age	HbA1c (%)
NPH	283	27.1%	8.4%
Detemir	168	16.1%	8.6%
Glargine	595	56.8%	8.7%

Glycaemic control 12 months post DAFNE

	Basal	12 months	P value
NPH	8.47%	7.94%	P=0.02
Detemir	8.71%	8.30%	
Glargine	8.61%	8.30%	

Changes in basal insulin post DAFNE

- 78% remained on the same basal insulin
- 6.5% changed from NPH to Detemir
- 2.8% changed from NPH to Glargine
- More changes occurred in the frequency of basal insulins

Changes in basal insulin 12 months post DAFNE

	Once Daily Pre	Once Daily Post	Twice Daily Pre	Twice Daily Post	P value
NPH	15.6%	9.0%	84.4%	91.0%	0.08
Detemir	32.2%	26.4%	67.8%	73.6%	0.28
Glargine	96.3%	88.1%	3.7%	11.9%	<0.0001

Changes in basal insulin frequency 12 months post DAFNE

	Once daily Pre	Once daily Post	P Value	Twice daily Pre	Twice daily Post	P Value
HbA1c (%)	8.6%	8.3%	0.09	8.5%	8.1%	0.002
Weight (kg)	75.2kg	75.2kg	0.98	76.8kg	75.6kg	0.37
Severe Hypos	1.24	0.37	0.01	1.68	0.86	0.16

Basal insulins and episodes of Severe Hypoglycaemia

	Pre DAFNE	Post DAFNE	P Value
NPH	0.84	1.06	0.11
Detemir	2.39	0.71	0.09
Glargine	1.23	0.36	0.02

Hypoglycaemia Awareness and DAFNE

	Pre DAFNE	Post DAFNE	P Value
NPH Aware	61.5%	65.1%	0.04
NPH Impaired and Unaware	38.5%	34.9%	
Detemir Aware	59.6%	60.8%	0.01
Detemir Impaired and Unaware	40.4%	39.2%	
Glargine Aware	59.0%	63.3%	<0.0001
Glargine Impaired and Unaware	41.0%	36.7%	

Basal insulins and the DAFNE Programme

- Twice daily NPH Insulin was associated with greater improvement in glycaemic control over 12 months
- Most patients remain on the same basal insulin post course attendance
- Twice daily basal insulin per se is associated with improved glycaemic control

Basal insulins and the DAFNE Programme

- There was a significant reduction in severe hypoglycaemia with Insulin Glargine 12 months post course attendance
- Hypoglycaemic awareness improved with all basal insulins
- There were no weight differences with the basal insulins

Limitations of this analysis

- Incomplete dataset (data was available for just 52.2% DAFNE graduates at 12 months)
- Bias from an incomplete dataset could be positive or negative
- Different DAFNE centres have preferences for different basal insulins, and thus centre difference is a potential confounder

Basal insulins and the DAFNE Programme

- Twice daily basal insulin provides better glycaemic control
- NPH remains the default DAFNE basal insulin, and the basal analogues have not demonstrated superiority in the DAFNE context
- **Our current practice regarding basal insulins maybe a barrier to graduates achieving optimal glycaemic control**

Lessons learnt from the DAFNE National Audit

- DAFNE improves glycaemic control long-term, but the achieved HbA1c is around 8%
- There is a reduction of severe hypoglycaemia, and improvement in hypoglycaemia awareness
- There is no accompanying weight gain
- Practice with different basal insulins varies, and may contribute to outcomes not being better