HBA1C IN A PRIMARY CARE COHORT WITH DIABETES AND CHRONIC KIDNEY DISEASE: THE ENHIDE RENAL TELEHEALTH PROJECT

Presented by Anne Currie

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ENHIDE
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HAEMOGLOBIN A1c (HbA1c)

- Measure of non-enzymatic glycation of Hb
- In normal RBC turnover (120 days) reflects average glycaemia control over past 90 days
- Used for both diagnosis and monitoring of Diabetes
- Results now reported based on IFCC - mmol/mol (rather than %)
- Diagnostic threshold for diabetes 48 mmol/mol (6.5%)

UK National Diabetes Audit 2007-2008* T2DM findings

- CKD defined from eGFR < 60 and ACR > 3
- Data on >800K of whom 42.3% had CKD
- Mean HbA1c was 65 mmol/mol if eGFR > 90 and 53 mmol/mol if eGFR < 15
- Target HbA1c (58 mmol/mol) attainment 68% overall , but increased with declining eGFR to 77% in CKD5 with microalbuminuria

*Hill et al, Diabetic Med 2014

RENAL TELEHEALTH HUB

Why was HbA1c lower with declining eGFR?

- ? Better glycaemic control
- ? Iatrogenic Hypoglycaemia
- ? Ageing and frailty
- ? Anaemia – falsely low
- ? Advanced CKD – assay and reduced gluconeogenesis

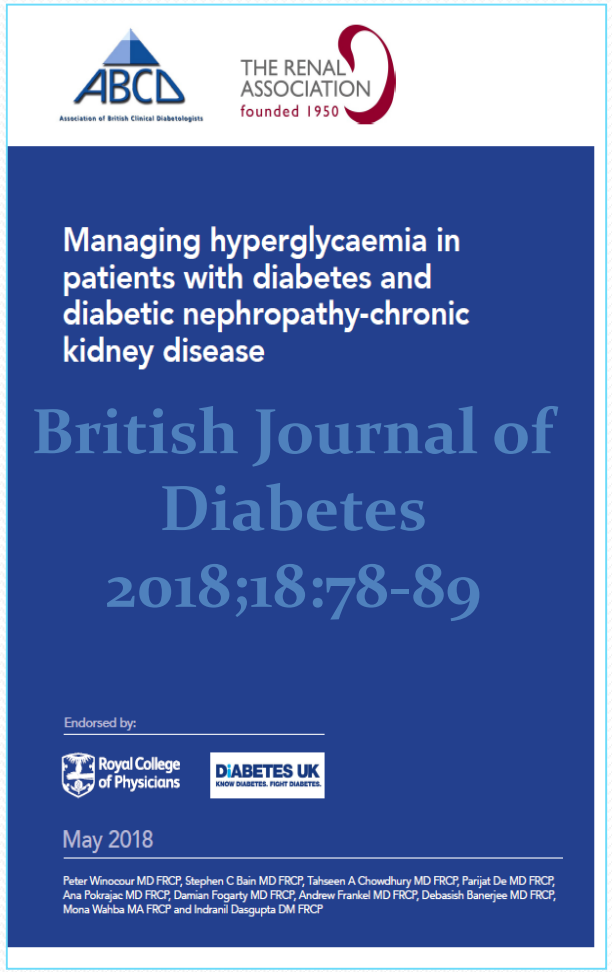
Evidence suggests there is Increased vulnerability to hypoglycaemia in elderly DM CKD

- Due to over treatment with insulin-SUs despite low HbA1c*
- Patients frequently on Insulin-SU treatment amongst elderly with ambulance call out +/- ED attendance with hypoglycaemia **

* Hamblin et al , D Med 2017. Penfonis et al , Diab Met Ob 2015

** Sampson et al, Diab Res Clin Pract 2017. Rajendran et al, Postgrad Med J 2015

Joint ABCD and Renal Association Guideline 2018



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ABCD-RA Guideline - Glycaemic targets in the prevention and management of diabetic nephropathy and chronic kidney disease

	Glycaemic target	Note
Type 1 Diabetes	48 – 58 mmol/mol (6.5-7.5%)	Younger patients within 10 years duration of diabetes and variable microalbuminuria-CKD stage 2
	58-62 mmol/mol (7.5-7.8%)	Majority of patients with proteinuria and/or CKD stages 3-4
	58-68 mmol/mol (7.5-8.5%)	**Patients with CKD stage 5 dialysis**
Type 2 Diabetes	48-58 mmol/mol (6.5-7.5%)	Majority of patients who are aged <40 years, or CKD stages 1-2 (no basis to aim for <52 mmol/mol unless aged <40 years and CKD stages 1-2)
	52-58 mmol/mol (6.9-7.5%)	CKD stages 3-4 this target may be appropriate with a GLP-1-SGLT-2 inhibitor based treatment regime without insulin
	58-68 mmol/mol (7.5-8.5%)	**For those with CKD stages 3-4 proteinuria who are on an insulin based regime, and those with CKD stage 5 who are on dialysis**

The ENHIDE Diabetes Renal Telehealth Project 2016-2018. Objectives

- Feasibility of extraction of comprehensive data sets from primary care diabetes registers for individual patient care
- Practicality and acceptability of telehealth virtual case review for primary care
- Extent of unmet clinical need
- Produce guidance for self management of acute illness and foot care

The ENHIDE Diabetes Renal Telehealth Project- Population Studied

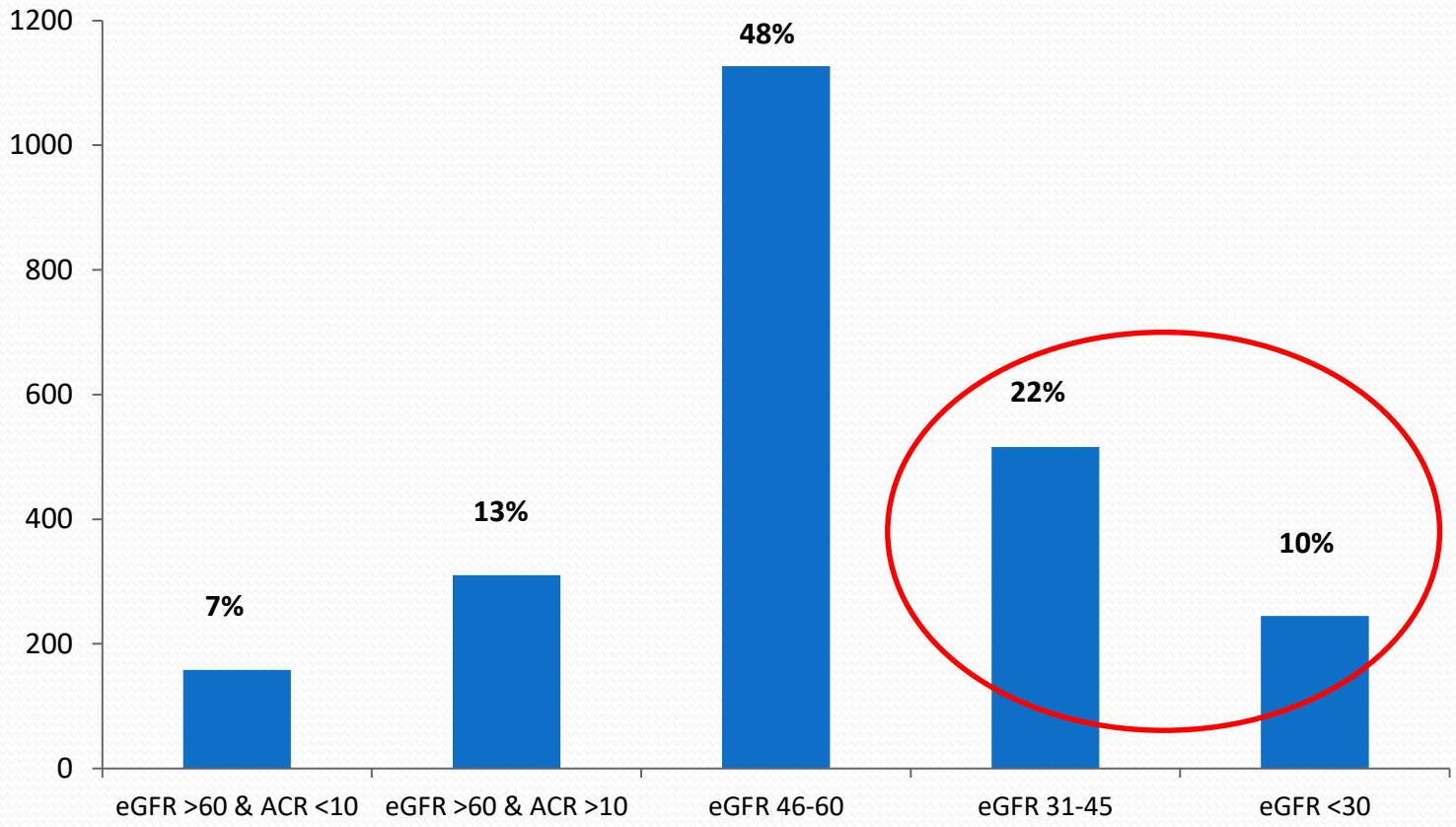
- 2356 adults from 16 general practices with CKD (eGFR < 60 and/or ACR > 10).
- 96% T2DM
- Review of latest HbA1c, Hb, renal status and lab derived values up to 2 years prior and DM and anaemia medication

Glycaemia and Hb

- Categorised for clinically significant changes in HbA1c if overall change of > 10 mmol/mol from value up to 2 years prior to updated result.
- Hypoglycaemia risk defined if HbA1c < 50 and on insulin and/or insulin secretagogues or HbA1c < 40 regardless of treatment
- Hb < 110 g/l considered anaemia – Rx anaemia recorded if > 110 g/l

Results n = 2356

81% solely managed by primary care



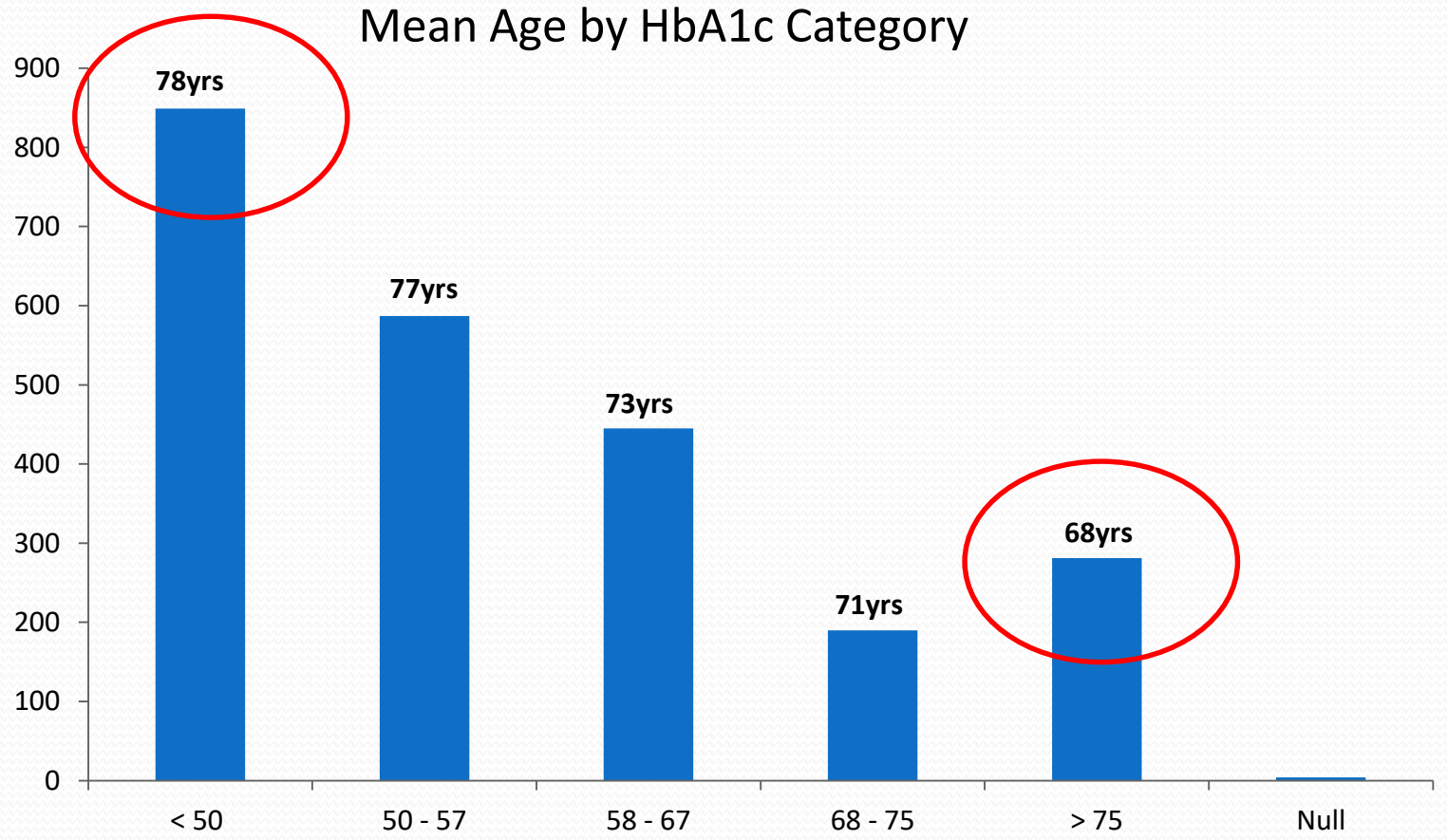
Age: 77* (19-103) **eGFR**: 52* (3-171), **ACR**: 9.9* (0.05-1428) *Median

Results

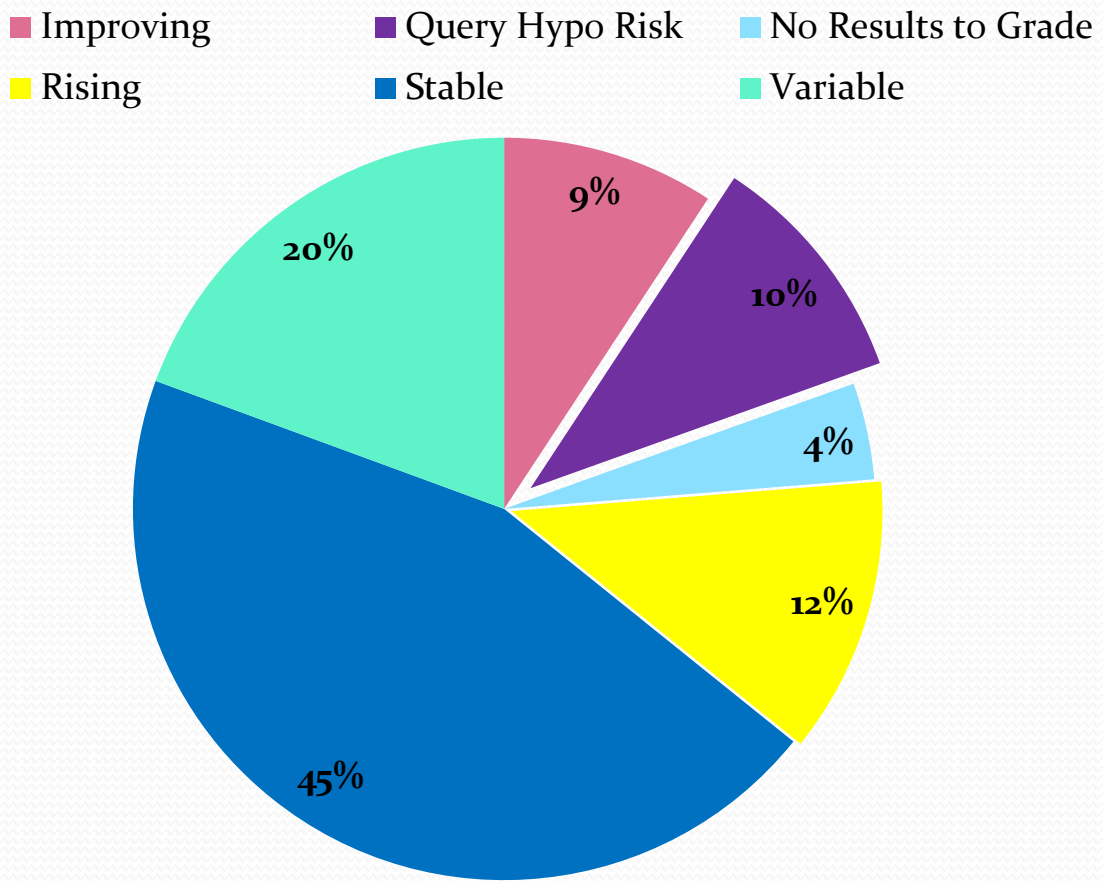
- Median HbA1c *53 (10-148) mmol/mol).
- HbA1c < 58 in 61% (compared to 68% in NDA)
- Hb ≤ 110 g/l in 16% + 15% Rx and Hb > 110g/l
- 49% solely on dietary management
- DM Rx – 20% on Insulin (inc 2.8% on Insulin & SU), 13% on SU, 18% on combo oral +/- GLP1

*Median (range) – missing HbA1c data in 4 cases

Results (n=2352)

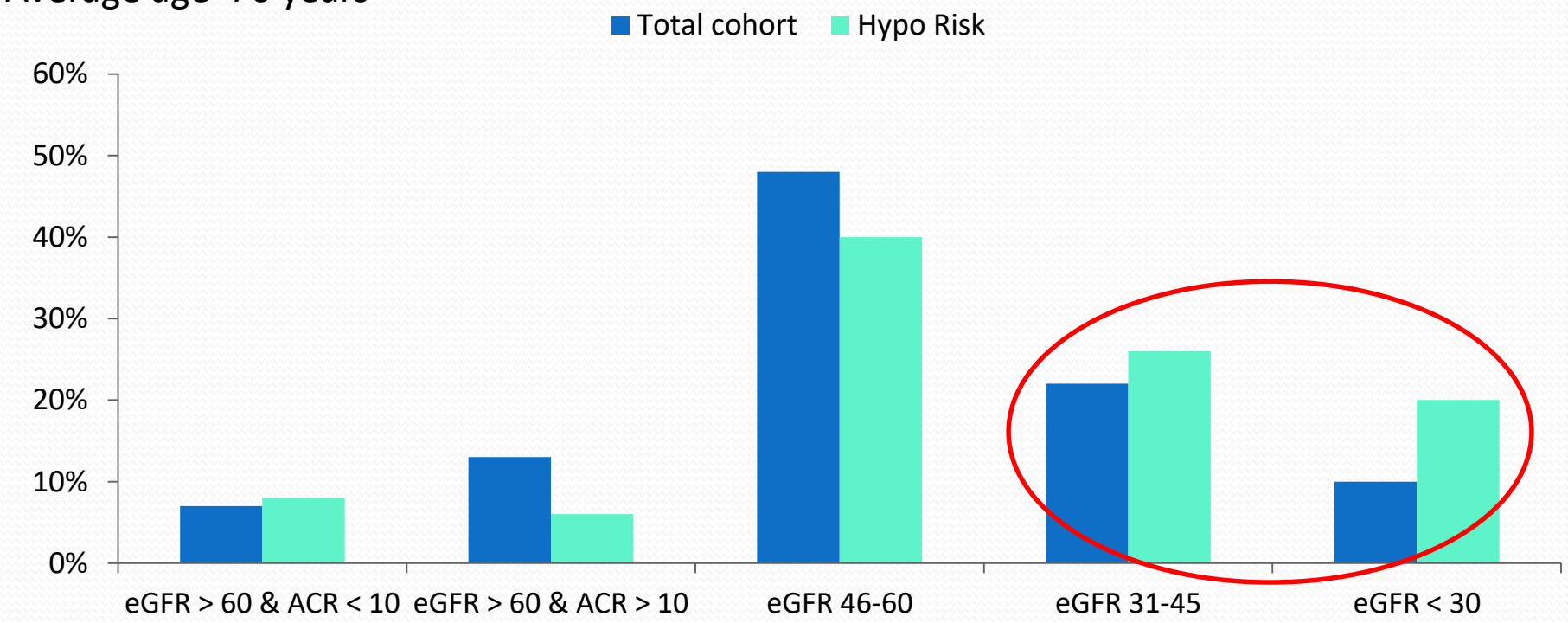


HbA1c Trends



? Hypo Risk Group n=242

Average age 76 years



- **Treatment**: 44% diet, 30% Insulin, 17% Sulfonylureas, 5% Insulin + Sulfonylureas, 4% Other
- 26% Hb < 110, (40% overall noted as anaemic)
- 43% BMI >30

Summary

- Most DM CKD are elderly - almost 50% diet Rx alone - 31% anaemic (half responded to Rx)
- ? Impact of eGFR-frailty-anaemia on reduced HbA1c levels - Unless Hb < 80 and/or eGFR < 30*
- Unmet DM clinical need :
- Hypo risk patients – iatrogenic V disease-related - modest numbers on insulin-SU (5.3% of DM CKD cohort – V other reports)
- Poor glycaemic control in 12% often aged < 75

*Borg et al , Diabet Med 2018

Conclusion

- ENHIDE DM Renal telehealth project was able to extract and analyse large data set for individual care
- Glycaemic control evaluation may be modified by factors such as anaemia and frailty
- There was important unmet clinical need in DM CKD managed in primary care relating to hypoglycaemia risk from potential over treatment in elderly and less effective control of hyperglycaemia in younger cohort
- The risk of iatrogenic hypoglycaemia in DM CKD in services with effective integrated care may be less than reported elsewhere
- Holistic case evaluation is necessary to individualise glycaemic management in DM CKD in primary care