

Ethnic differences in renal referral patterns following national CKD guidelines

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Background

- Type 2 diabetes mellitus (T2DM) is 4 times more prevalent in Indo-Asian (IA) patients than White Europeans (WE) in the UK
- Their risk of developing end stage renal disease (ESRD) is 13 times greater than that of Europeans with T2DM¹ (figure 1)
- In 2007, 10% of incident patients receiving renal replacement therapy were Indo-Asian, compared with 4% Indo-Asian ethnicity in the UK population²

National interventions to guide the management of CKD in the UK were introduced between 2005 and 2006:

- Publication of a National Service Framework
- Automated reporting of estimated glomerular filtration rate (eGFR)
- Introduction of CKD parameter targets in primary care incentive frameworks

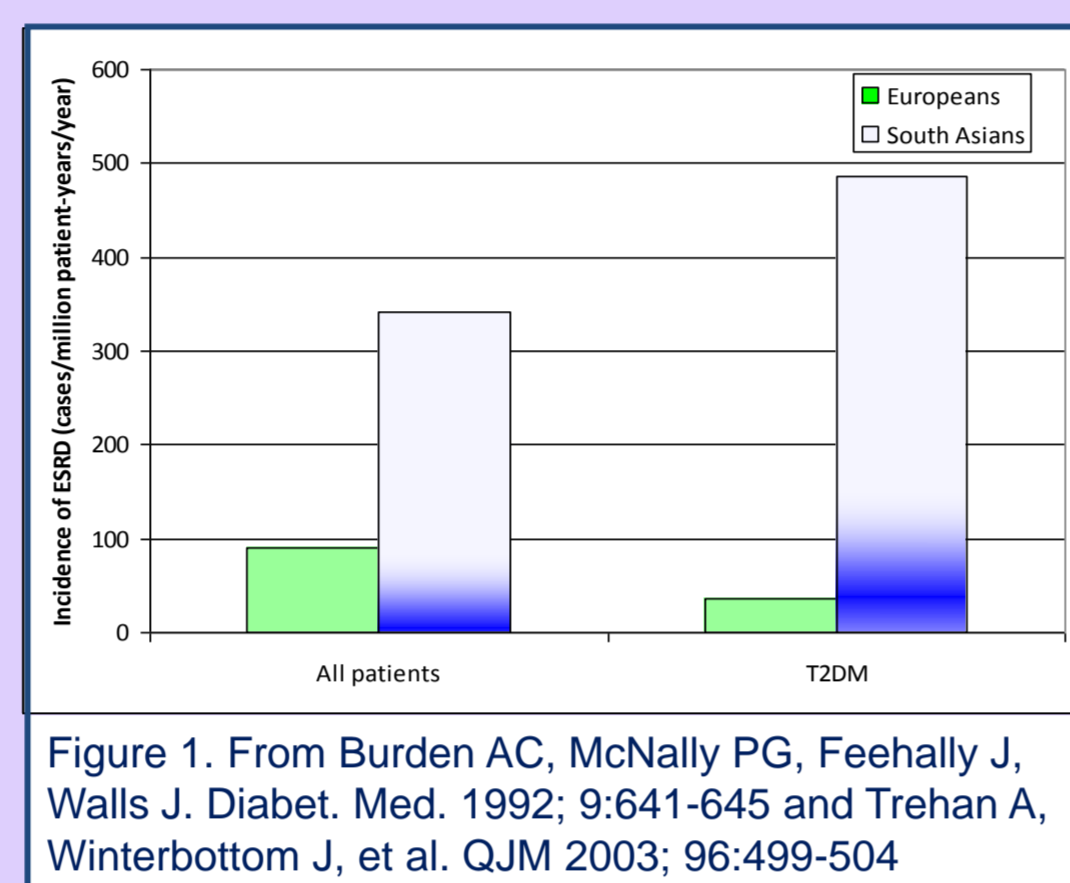


Figure 1. From Burden AC, McNally PG, Feehally J, Walls J. Diabet. Med. 1992; 9:641-645 and Trehan A, Winterbottom J, et al. QJM 2003; 96:499-504

As part of Kidney Research UK's ABLE programme, we investigated the impact of these interventions on the status of Indo-Asian (IA) and white European (WE) patients with T2DM at the time of referral to specialist renal services.

Methods

Patients and data collection

Demographic and clinical data were collected from all IA and WE patients with T2DM newly referred to specialist renal clinics in 4 UK centres in 2004 and in 2007.

Patients were excluded if a diagnosis of T2DM had been made after the referral, aged less than 16 years or had previous consultation with nephrology services.

Data was obtained from retrospective analysis of hospital notes, computerised records and pathology data systems. Cases were identified by systematic review of all referrals within the specified time periods.

Ethnicity data was obtained by patient self-reporting on arrival at out-patient clinics according to the 2001 UK Census ethnicity classification. WE status included all white backgrounds; IA status included Indian, Pakistani and Bangladeshi origin.

Statistical analysis

Categorical data were compared between ethnic cohorts with Chi-squared or Fisher's Exact tests. Continuous data were compared using Student's t-test or Mann Whitney U test. Logistic and linear regression analysis was used to adjust for age, sex, cardiovascular disease and duration of T2DM.

Analyses were performed using SPSS 16.0 (SPSS Inc). A p value of <0.05 was considered significant.

Results

In 2004, 361 patients with T2DM were seen following referral to specialist renal services of whom 161 (49.4%) were Indo-Asian.

In 2007, 251 patients were seen of whom 114 (44.9%) were Indo-Asian – a 30% reduction in total referrals. This is accounted for by a reduction in patients with earlier CKD (stages 1 to 3) being accepted for review (figure 2).

The reduction in total referrals was more marked for IA patients than WE patients (36% vs 25%, p=0.023).

Patients were referred with more advanced renal disease in 2007 than in 2004 (table 1), particularly among WE (mean eGFR 32.7 vs 40.6 ml/min, p<0.001) rather than IA patients (mean eGFR 42.8 vs 47.3 ml/min, p=0.123).

All patients		2004	2007	p value
Serum creatinine (µmol/l)	Mean (SD)	167 (94)	183 (91)	0.065*
MDRD eGFR (ml/min)	Mean (SD)	44 (22)	37 (19)	0.003*
Protein:Creatinine ratio (mg/mmol)	Median (IQR)	19.8 (98.0)	40.9 (139.8)	<0.001
Microalbuminuria	N (%)	92 (25.4)	67 (26.4)	0.513†
Overt proteinuria	N (%)	125 (52.5)	104 (57.1)	0.016†
Systolic blood pressure (mmHg)	Mean (SD)	146 (22)	142 (27)	0.039*
Diastolic blood pressure (mmHg)	Mean (SD)	77 (12)	74 (14)	0.026*
Serum cholesterol (mmol/l)	Mean (SD)	4.4 (1.1)	4.1 (1.1)	0.005*
Number of antihypertensives	Mean (SD)	2.3 (1.4)	2.6 (1.8)	0.013*
ACE inhibitor or ARB	N (%)	191 (53.1)	156 (61.4)	0.027#
Aspirin or clopidogrel	N (%)	194 (53.9)	176 (69.3)	<0.001#
Statin	N (%)	215 (59.7)	196 (77.2)	<0.001#

Table 1. More advanced renal dysfunction amongst patients with T2DM referred in 2007 vs 2004, but increased control of cardiovascular risk factors through more prescribed renoprotective and cardioprotective therapies. *Adjusted for age and sex; †adjusted for age, sex and duration of diagnosis of T2DM; #adjusted for age, sex and cardiovascular disease. ACE, angiotensin converting enzyme; ARB, angiotensin receptor blocker.

In 2004, IA patients were younger at the time of referral than WE patients (63.0 vs 70.1 years, p<0.001) and diabetes control was worse (HbA_{1c} 8.1% vs 7.4%, p=0.009). After adjusting for age and sex there were no differences in duration of diagnosis of T2DM, renal function, proteinuria, prescribed medication or vascular complications.

Following national CKD guidelines, in 2007 IA patients were again significantly younger than WE, although mean age increased in both cohorts. Despite a relative preservation of renal function in IA patients, WE patients had equivalent blood pressure and less vascular disease (table 2).

2007 cohort		European	Indo-Asian	p value
Age (years)	Mean (SD)	70.5 (11.5)	67.6 (10.5)	0.035
Duration of T2DM (years)	Mean (SD)	11.6 (9.8)	14.4 (7.7)	0.016*
HbA _{1c} (%)	Mean (SD)	7.5 (1.8)	7.9 (1.7)	0.079*
Systolic blood pressure (mmHg)	Mean (SD)	142 (29)	143 (25)	0.715*
Diastolic blood pressure (mmHg)	Mean (SD)	73 (14)	77 (14)	0.184*
Serum creatinine (µmol/l)	Mean (SD)	194 (94)	171 (88)	0.054*
MDRD eGFR (ml/min)	Mean (SD)	32.7 (1.2)	42.8 (2.3)	<0.001*
Protein:Creatinine ratio (mg/mmol)	Median (IQR)	35.7 (104.7)	51.6 (173.7)	0.170
Any macrovascular disease	N (%)	63 (46)	70 (61.4)	0.007*
Ischaemic heart disease	N (%)	49 (36)	61 (54)	0.004*
Cerebrovascular disease	N (%)	18 (13.2)	14 (12.4)	0.909*
Peripheral vascular disease	N (%)	15 (11)	10 (8.8)	0.827
Any microvascular disease	N (%)	41 (29.9)	51 (44.7)	0.024*
Retinopathy	N (%)	36 (26.5)	48 (42.5)	0.011*
Neuropathy	N (%)	16 (11.8)	18 (15.9)	0.35*
Number of antihypertensives	Mean (SD)	2.6 (2.1)	2.8 (1.3)	0.29*
ACE inhibitor or ARB	N (%)	81 (59.1)	73 (64.6)	0.799#
Aspirin or clopidogrel	N (%)	87 (63.5)	87 (76.3)	0.106#
Statin	N (%)	100 (73)	94 (82.5)	0.078#

Table 2. Baseline clinical and biochemical parameters at time of referral to specialist renal services in 2007 following national CKD guidelines. *Adjusted for age and sex. #Adjusted for age, sex and cardiovascular disease

Conclusions

- National CKD management guidelines led to a reduction in the number of patients with T2DM seen in specialist renal services.
- More patients received reno- and cardioprotective therapy at the time of referral, supporting success in transfer of early CKD and T2DM management to primary care.
- Despite their younger age there is an increased prevalence of microvascular and macrovascular disease among IA patients with T2 DM.
- Prospective studies to evaluate the effect of these guidelines on rates of CKD progression and ESRD between ethnic groups are required.

References

- Burden AC, McNally PG, Feehally J, Walls J. Increased incidence of end-stage renal failure secondary to diabetes mellitus in Asian ethnic groups in the United Kingdom. Diabet Med, 1992; 9:641-645
- Ansell D, Feehally J, Fogarty D, Tomson C, Williams AJ, Warwick G. UK Renal Registry Report 2008, UK Renal Registry, Bristol, UK

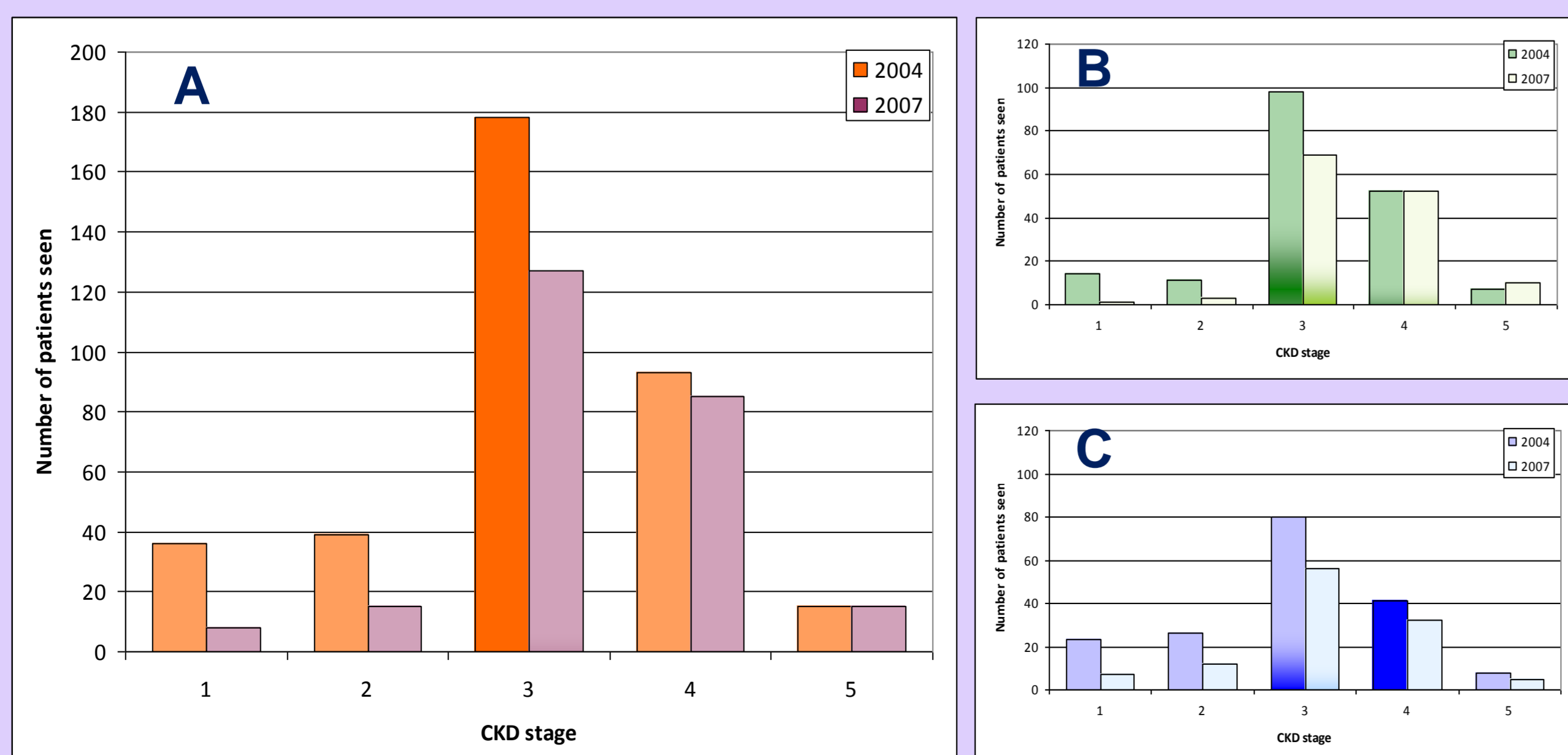


Figure 2. Decrease in referrals with T2DM seen in specialist renal clinics 2004 to 2007. A. All patients. B. White European patients. C. Indo-Asian patients.