Renal risk: A population study of New Zealand diabetics

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INTRODUCTION

- Diabetic nephropathy is now the most common cause of end stage renal disease (ESRD) in New Zealand.
- The diabetic population is over-represented by the Māori people, compromising of 50% of diabetics in New Zealand[1].
- Māori people are known to develop diabetes at a younger age, increasing their lifetime exposure to hyperglycaemia, and overall progression of the disease.
- Inequalities in health between the Māori and non- Māori population have been known for a long time, with a life expectancy of 8-9 years lower than non-Māori[2-4].
- The pressure on nephrologists is to identify risk factors to predict those at risk of progression to ESRD is increasing.
- The KDIGO CKD guidelines[5] were therefore used to assess renal risk in accordance to the table shown below:

Guide to Frequency of Monitoring (number of times per year) by GFR and Albuminuria Category				Persistent albuminuria categories Description and range		
				A1 Normal to mildly increased <30 mg/g <3 mg/mmol	A2 Moderately increased 30–300 mg/g 3–30 mg/mmol	A3 Severely increased >300 mg/g >30mg/mmol
GFR categories (ml/min/1.73 m²) Description and range	G1	Normal or high	≥90	1 If CKD	1	2
	G2	Mildly decreased	60–89	1 If CKD	1	2
	G3a	Mildly to moderately decreased	45–59	1	2	3
	G3b	Moderately to severely decreased	30–44	2	3	3
	G4	Severely decreased	15–29	3	3	4+
	G5	Kidney failure	<15	4+	4+	4+

Table 1: KDIGO guidelines CKD risk categories

Aim:

Assess the "Renal Risk" of a diabetic population using recognised international criteria.

METHOD

Data was collected on 1829 unselected diabetic patients from primary care diabetes registers using the 'Medtech 32' database system and recorded on a Microsoft Excel spread sheet for further analysis.

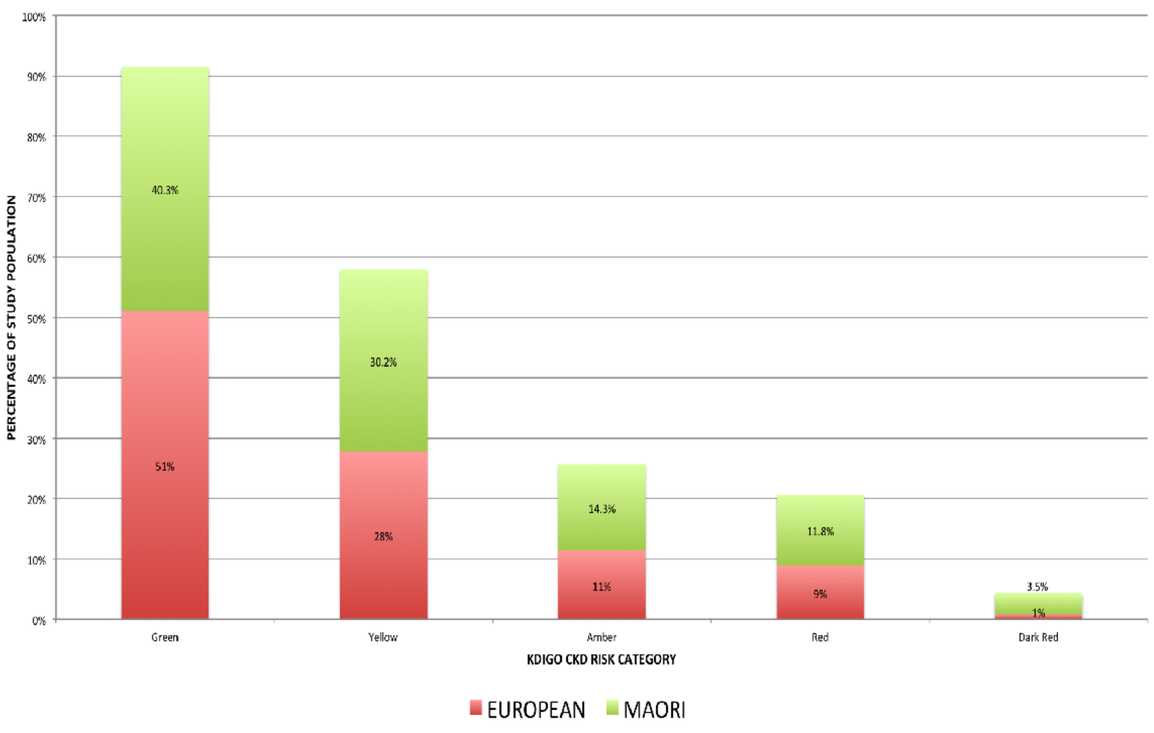
Study type:

Retrospective population analysis

Data points:

Age, gender, date of birth, ethnicity, type of diabetes, diagnosis of proliferative retinopathy, treatment type, last HbA1C, latest creatinine, latest eGFR, latest ACR, loss of greater than 5 mls per year, renal referral, CKD diagnosis, ACEI/ARB use and type, last blood pressure reading, number of anti-hypertensive medication, smoking history, smoking cessation offered, BMI, CVD risk and cholesterol.

Graph 1: Percentage of European vs. Maori people represented for each KDIGO CKD risk category



RESULTS

- 39% of patients in this study were of Māori origin; comparatively at a population level only 23.5% of Hawke's Bay are of Māori origin.
- In the last year 28.1% had lost greater than 5mls of eGFR (rapid progression), only 5% of which had been referred to a nephrologist.
- 46% were KDIGO CKD green, 29% were CKD yellow, 19% CKD amber, 10% were CKD red and 2% CKD dark red. (colours adapted from KDIGO guidelines[5])
- Māori population:
  - 12% are in the red and 4% in the dark red (graph 1).
- European patients:
  - 9% and 1% were in the red and dark red risk respectively (graph 1).
- Treatment targets for the sample population (not shown) were achieved for:
  - BP (<140/90mmHg): **59.8%**
  - HbA1c (<53mol/mmol) **: 44%**
  - On ACEI/ARB as per recommendation by guidelines: **77%**

DISCUSSION

- Māori were more likely to be in the higher CKD risk categories compared to Europeans.
  - 66% of total study population in the dark red CKD category being Maori compared to only 20% of Europeans (not shown).
- There are currently significant differences in the rates of achieving KDIGO treatment targets between the Māori and non-Māori individuals

Limitations:

- Although this was an unselected population of Hawke's Bay diabetics, further work is being carried out to complete the study to include the district.

Clinical implications

- Individualized assessment to take into account risk factors for progression should be carried out. Optimal targets, as recommended by KDIGO guidelines i.e. HBA1c <53mol/mmol, ACEI if ACR>3mg/mmol, should be carried out in primary care. Review appointments recommended as per CKD risk category (table 1) should be carried out.

Further work

- Other parameters such as BMI, CVD risk, cholesterol, history of smoking may provide a better indication of renal risk
- Using the study population, and assessment of parameters, a risk score which predicts progression to ESRD may be beneficial to identify at risk individuals, and alert primary care practitioners to refer patients to secondary care.

Table 2: CKD risk category for sample population

CKD category	Number of people	Percentage
GREEN	783	43%
YELLOW	503	28%
AMBER	334	18%
RED	165	9%
DARK RED	35	2%

TABLE 3: KDIGO Treatment targets for Maoris vs. Europeans

TREATMENT TARGETS		MAORI	EUROPEAN
ACEI if Albuminuria >3mg/mmol	YES	80%	71%
	NO	20%	29%
HBA1c = 53mmol/mol	YES	39%	52%
	NO	61%	48%

CONCLUSION

- The study identifies 10% and 2% of unselected New Zealand diabetic individuals are at high risk (red) and very high risk (dark red) of progressing to dialysis dependent renal failure.
- Of the population studied, patients of indigenous Māori origin were overly represented in the population as a whole and had significantly greater "Kidney Risk".
- Identification and individualised targeting of at risk patients may be necessary to reduce the risk of progression.

REFERENCES

1. Moore MP, Lunt H. Diabetes in New Zealand. *J Am Med Assocation*. 2000;50 Suppl 2:S65–71.
2. Ellison-Loschmann L, Pearce N. Improving access to health care among New Zealand's Maori population. *Am J Public Health*. 2006;96(4):612–7. doi:10.2105/AJPH.2005.070680.
3. Pearce J, Dorling D. Increasing geographical inequalities in health in New Zealand , 1980 – 2001. *Int J Epidemiol*. 2006;35(February):597–603. doi:10.1093/ije/dyl013.
4. Harris R, Tobias M, Jeff M, Waldegrave K, Karlsen S, Nazroo J. Effects of self-reported racial discrimination and deprivation on Māori health and inequalities in New Zealand: cross-sectional study. *Lancet*. 2005;367:2005–2009.
5. Group KDIGO (KDIGO). Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int Suppl*. 2013;3(1):4–4. doi:10.1038/kisup.2012.76.

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