# Renal complications

## Risk scores for predicting progression in CKD

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Risk scores for cardiovascular morbidity and mortality are now routinely used in clinical practice. The *National Service Framework for Renal Services* (Department of Health, 2005) recommends the use of estimated glomerular filtration rate (eGFR) to assess renal function and define the stages of chronic kidney disease (CKD). However, identification of those with previously unidentified CKD stage 3 has the potential to flood renal services with patients who will not progress to end-stage renal disease (ESRD). There is a pressing need for a simple method of risk assessment, applicable to all people with CKD, to identify those at greatest risk of progression.

The RENAAL investigators (Keane et al, 2006) studied the risk of ESRD and/or death in patients with type 2 diabetes and nephropathy. Albuminuria, hypoalbuminaemia, elevated creatinine, and anaemia were identified as strong predictors for progression; risk prediction improved from 50% using albuminuria alone, to >80% with the inclusion of all four factors. Interestingly, even mild degrees of anaemia (Hb <13.8 g/dL) were associated with an increased risk of progression.

As aggressive blood pressure control was an integral part of the study, it was not identified as an independent risk factor for progression.

Workers at Kaiser Permanente Northwest (Johnson et al, summarised below) have identified six variables – age, gender, diagnosis of hypertension, diabetes, anaemia (Hb <12g/dL) and eGFR – that could be readily extracted from their routinely collected patient data and predicted the risk of onset of ESRD requiring renal replacement therapy in the general population. They then used this score to examine the 5-year risk of progression to ESRD. Points were assigned according to patient characteristics that identified the highest-risk patients effectively, with approximately 20% of patients progressing in the highest quintile of the risk score to minimal numbers (<0.2%) in the lowest.

Proteinuria has already emerged as an indicator of renal risk. Validation of these risk scores, as well as further studies, are now required to develop a renal risk score applicable to more general populations with CKD to enable better targetting of treaments and those at risk of progression.

Department of Health (2005) *National Service Framework for Renal Services*. DH, London

Keane WF, Zhang Z, Lyle PA et al (2006) Risk scores for predicting outcomes in patients with type 2 diabetes and nephropathy: the RENAAL study. *Clin J Am Soc Nephrol* **1**: 761–7

## AMERICAN JOURNAL OF KIDNEY DISEASES

### Risk scoring system predicts CKD progression to ESRD

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| **Readability** | ✓✓✓ |
| **Applicability to practice** | ✓✓ |
| **WOW! factor** | ✓✓ |

**1** It is important to reliably identify people with chronic kidney disease (CKD) so that interventions can be made to slow the rate of progression to end-stage renal disease (ESRD).

**2** The authors developed a risk-scoring system to predict the 5-year risk of renal replacement therapy (RRT) in people with stage 3 or 4 CKD.

**3** Data routinely collected from 9782 patients with CKD were retrospectively analysed; 323 people progressed to RRT with an observed 5-year risk of 3.3%.

**4** Six characteristics (age, gender, estimated glomerular filtration rate, diabetes, anaemia and hypertension) in the risk-scoring system effectively discriminated patients according to their observed risk of RRT: 19% in the highest-risk profile progressed, and 0.2% in the lowest-risk group progressed.

**5** The risk scoring system also showed effective calibration, as the 5-year observed and predicted risks were consistently within 1% of each other.

Johnson ES, Thorp ML, Platt RW, Smith DH (2008) Predicting the risk of dialysis and transplant among patients with CKD: a retrospective cohort study. *Am J Kidney Dis* **52**: 653–60

## CRITICAL CARE MEDICINE

### Higher long-term mortality in patients with ESRD in the ICU

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| **Readability** | ✓✓ |
| **Applicability to practice** | ✓✓ |
| **WOW! factor** | ✓✓ |

**1** Over the past decades, there has been an increase in the number of people with end-stage renal disease (ESRD).

**2** Additionally, an increase in older individuals with ESRD has resulted in more admissions to the intensive care unit (ICU).

**3** This study examined the short- and long-term outcomes of 245 people with ESRD admitted to the ICU requiring renal replacement therapy (RRT), compared with long-term mortality among people with ESRD never admitted to the ICU.

**4** Ninety-day mortality was higher with increasing age, diabetes, heart failure, the main kidney diagnosis, nephrosclerosis and uraemia, with diabetes and heart failure being significant 90-day mortality risk factors (odds ratio 1.9 and 2.0, respectively).

**5** Patients with ESRD in the ICU had significantly higher long-term mortality compared with those with ESRD who have never been admitted to the ICU (relative risk of death 2.32; confidence interval [CI] 1.84–2.92).

**6** Long-term mortality was associated with age and heart failure; after adjustment for age, heart failure remained a significant risk factor for death in the patients with ESRD in the ICU who had survived 90 days (risk ratio 2.88; CI 1.53–5.33).

**7** The long-term mortality of the ESRD patients in the ICU was 25 times higher than the mortality rate of the general population (95% CI 20–31).

Bell M, Granath F, Schön S et al (2008) End-stage renal disease patients on renal replacement therapy in the intensive care unit: short- and long-term outcome. *Crit Care Med* **36**: 2773–8

## DIABETIC MEDICINE

### Risk profile of LADA similar to diabetes

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| Readability | ✓✓✓ |
| Applicability to practice | ✓✓✓ |
| WOW! factor | ✓✓✓ |

**1** This study compared the prevalence and incidence of complications, cardiac mortality and all-cause mortality in people with latent autoimmune disease in adults (LADA) with those for people with type 2 diabetes and no antibodies to glutamic acid decarboxylase (GAD).

**2** Overall, 1255 people with type 2 diabetes had GAD antibodies measured at baseline. Complications were ascertained from annual assessments, and hospital admissions and mortality data for the past 13 years.

**3** Of the cohort, 45 people (3.6%) had LADA, with a similar risk of complications and death to those with type 2 diabetes without GAD antibodies.

**4** Cardiovascular risk management for LADA should be similar to that for type 2 diabetes without GAD antibodies.

Myhill P, Davis WA, Bruce DG et al (2008) Chronic complications and mortality in community-based patients with latent autoimmune diabetes in adults. *Diabet Med* **25**: 1245–50

## DIABETIC MEDICINE

### High triglyceride levels linked with albuminuria

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| Readability | ✓✓ |
| Applicability to practice | ✓ |
| WOW! factor | ✓✓ |

**1** This study sought to determine the link between dyslipidaemia and albuminuria in a cohort of 400 people with type 1 diabetes of a mean duration of 55 years.

**2** Urinary albumin–creatinine ratio was used as the screening test for microalbuminuria; $HbA_{1c}$, creatinine, non-fasting triglycerides and total, HDL- and LDL-cholesterol were also analysed.

**3** Of the cohort, 36% of patients had albuminuria; multiple logistic regression analysis (with adjustments) showed that hypertriglyceridaemia was more likely to be linked with the presence of albuminuria (odds ratio 1.4).

**4** Higher triglyceride levels are associated with albuminuria in patients with extreme duration of diabetes; although they may be a potential risk factor for the development of diabetic nephropathy, the benefit of targeting triglycerides aggressively needs further investigation.

Daousi C, Bain SC, Barnett AH, Gill GV (2008) Hypertriglyceridaemia is associated with an increased likelihood of albuminuria in extreme duration (>50 years) type 1 diabetes. *Diabet Med* **25**: 1234–6

## ENDOCRINE PRACTICE

### Spironolactone reduces albuminuria

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| Readability | ✓✓ |
| Applicability to practice | ✓✓✓ |
| WOW! factor | ✓✓ |

**1** The study assessed the effect of adding spironolactone to angiotensin-converting enzyme (ACE) inhibitors on reducing proteinuria associated with diabetic nephropathy.

**2** Twenty-four people with type 2 diabetes and albuminuria (11 with microalbuminuria; 13 with macroalbuminuria) were followed for 12 weeks (over four clinic visits, 4 weeks apart).

**3** On visit two, low-dose spironolactone was commenced for 4 weeks; clinical assessments were made at each visit.

**4** Urinary albumin excretion reduced by 27.2% ($P=0.05$) in the microalbuminuria group and by 24.3% ($P=0.02$) in the macroalbuminuria group.

**5** Spironolactone is effective in reducing albuminuria in people with type 2 diabetes on ACE inhibitors.

Davidson MB, Wong A, Hamrahian AM et al (2008) Effect of spironolactone therapy on albuminuria in patients with type 2 diabetes treated with ACE inhibitors. *Endocr Pract* **14**: 985–92

## NEPHROLOGY DIALYSIS TRANSPLANTATION

### ARBs reduce proteinuria and offer renoprotection

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| Readability | ✓✓ |
| Applicability to practice | ✓✓✓ |
| WOW! factor | ✓✓ |

**1** Angiotensin-receptor blockers (ARBs) may possess renoprotective mechanisms that reduce proteinuria in people with type 2 diabetes.

**2** This double-blind, prospective, parallel-group, non-inferiority study comprised 885 people with hypertension, type 2 diabetes and overt nephropathy who were randomised to the ARBs telmisartan (80 mg once daily) or valsartan (160 mg once daily).

**3** The primary endpoint was the change in 24-hour proteinuria from baseline to 12 months; secondary endpoints included changes in 24-hour albuminuria, estimated glomerular filtration rate (eGFR) and levels of established markers of oxidative stress and inflammation.

**4** Both telmisartan and valsartan demonstrated similar reductions in 24-hour urinary protein excretion rates (both giving a geometric mean reduction of 33%).

**5** No significant differences between the two ARBs were seen from changes in 24-hour urinary albumin excretion rate and eGFR between baseline and 12 months.

**6** Both ARBs offered greater renoprotection in people with better blood pressure control.

**7** There was no evidence that the ARBs modified inflammatory parameters in people with type 2 diabetes and advanced kidney disease.

Galle J, Schwedhelm E, Pinnetti S et al (2008) Antiproteinuric effects of angiotensin receptor blockers: telmisartan *vs* valsartan in hypertensive patients with type 2 diabetes mellitus and overt nephropathy. *Nephrol Dial Transplant* **23**: 3174–83

> *"Although they may be a potential risk factor for the development of diabetic nephropathy, the benefit of targeting triglycerides aggressively needs further investigation."*