



Body Mass Index [BMI] with Mortality and Institution of Renal Replacement Therapy [RRT] in an Australian Population with Chronic Kidney Disease [CKD]

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 on behalf of the NHMRC CKD.CRE and CKD.QLD Collaborative

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Aim

- To evaluate the association of BMI with mortality and institution of RRT in patients with CKD.

Background

- Dialysis patients who are overweight and obese are reported to have better survival compared with those with lower BMI.
- However, the association of BMI with mortality has not been established in patients with CKD.
- CKD.QLD is a program for surveillance, practice improvement and research in CKD. It is a collaboration of the renal practice network in the adult public health system in the Australian state of Queensland, and with the public health service provider, Queensland Health.
- Enrolment of patients in CKD.QLD is by informed consent. It began in May 2011 at the Royal Brisbane and Women's Hospital [RBWH] and in June 2011 at the Toowoomba Hospital.
- Events of death without RRT and the institution of RRT were recorded until site censor dates [RBWH July 2015; Toowoomba December 2015].

Methods

- This was a retrospective analysis of pre-terminal CKD patients in public renal specialty practices from two major sites within the CKD.QLD registry.
- Survival time was calculated from time of enrolment to event [death without RRT or RRT] or site censor dates.
- The classical WHO BMI categories were consolidated into the 4 groupings as follows:

CATEGORY	BMI
Underweight	<20
Normal	20 to <25
Overweight, obese and markedly obese	25 to 40
Morbidly obese	≥ 40

Notably, those who were overweight, obese and markedly obese were combined into a single category because they had similar survival characteristics.

- Associations of these BMI categories with subsequent death without RRT and with RRT were examined with Kaplan-Meier curves. Cox regression models were also used, adjusting for hospital site, age, sex, CKD stage at enrolment, primary renal disease and co-morbidities.

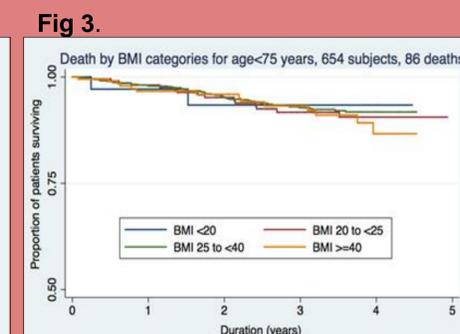
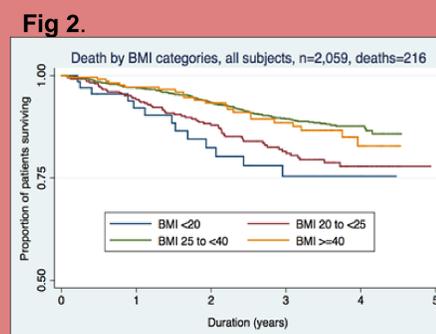
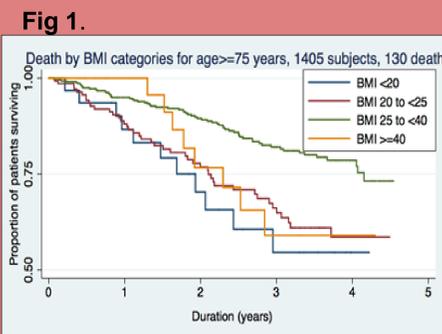
Results

- There were **2,059** patients with a follow-up time of **4,391** person years.
- Their ages at enrolment ranged from 18 to 98 years, with a median of 69 years.
- BMI ranged from 14.5 to 59.8 with a median of 29.7 kg/m². Fully 80% of the group had a BMI greater than normal.
- 216** patients died without RRT [10%]. Their median age at enrolment was 78 years, and at death was 80 years
- 151** started RRT [7%]. Their median age at enrolment was 61 years and median age at start of RRT was 63 years. Only 15 of the patients who started RRT were aged ≥ 75 years at enrolment.

BMI	n	%
<20	70	3
20-24	361	17
25-39	1,389	68
≥ 40	239	12
	2,059	100%

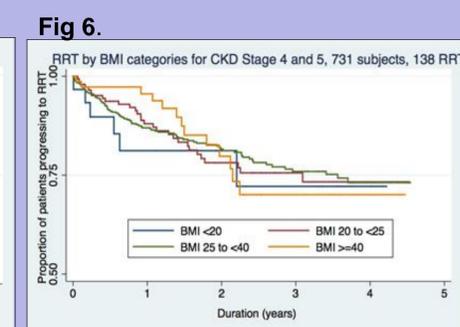
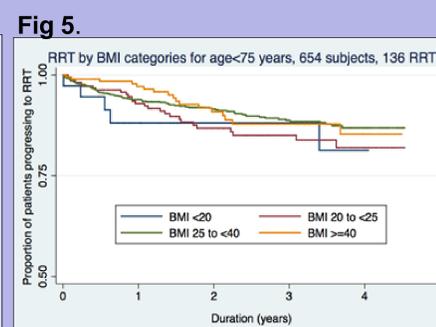
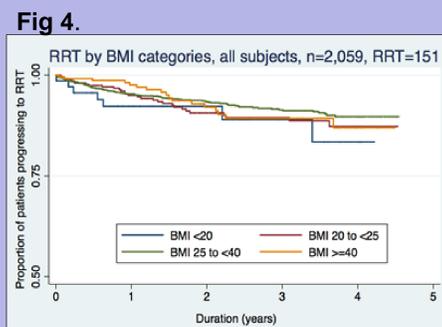
Death by BMI categories

- Fig 1.** In the aggregate cohort, there were 216 deaths. Those who were underweight and normal weight had a higher risk of death.
- Fig 2.** However, when examined by age group, in those under 75 years at enrolment BMI was not associated with mortality, among the 86 deaths.
- Fig 3.** BMI was associated with mortality only in those ≥ 75 years at enrolment. Mortality was highest in those who were underweight, normal weight or morbidly obese, relative to those with BMIs of 25-39.



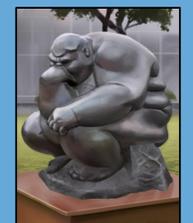
RRT by BMI categories.

- BMI categories were not associated with RRT when assessed across the entire cohort.
- Fig 4.** There was no significant association of the start of RRT by BMI categories [n=151]
- Fig 5.** This applied when only subjects < 75 years were examined and, as shown in **Fig 6**, also for those with advanced CKD stage [stage 4 and 5] on enrolment.



Conclusions

- 80% of this CKD cohort had a BMI greater than normal.
- Patients with CKD who died without RRT were much older at the time of event than those that commenced RRT [80 vs 63 years].
- Patients with CKD who were underweight, normal or morbidly obese had markedly higher mortality than those with a BMI of 25 to 39. This affect was confined to those ≥ 75 years of age at enrolment.
- Underweight and normal weight in the elderly may be a marker of ill-health and of poor prognosis. It seems intuitive that morbid obesity should also be a predictor of a greater increased risk.
- BMI categories were not associated with the institution of RRT in this cohort.



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Sponsors:

