

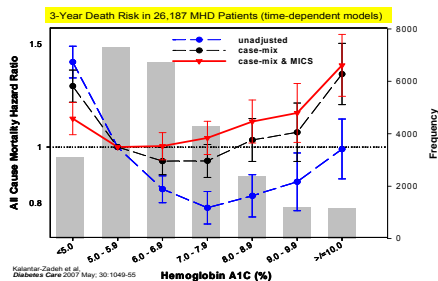
# Examining the Mortality-Predictability of Hemoglobin A1c in Chronic Peritoneal Dialysis Patients in the USA

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## Background

- A recent study showed that in diabetic hemodialysis patients (pts), higher A1c is associated with death risk (Kalantar-Zadeh et al, Diabetes Care 2007).
- The association between A1c and survival in chronic peritoneal dialysis (CPD) pts may be confounded by glucose loading in PD fluid, leading to worsened metabolic control in CPD



## Hypothesis

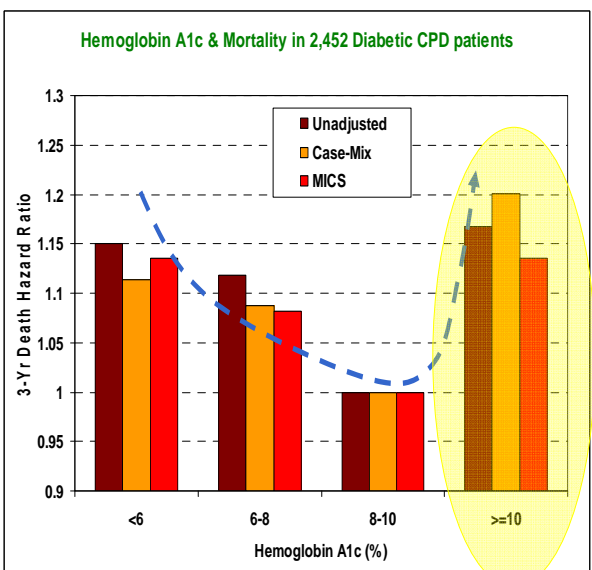
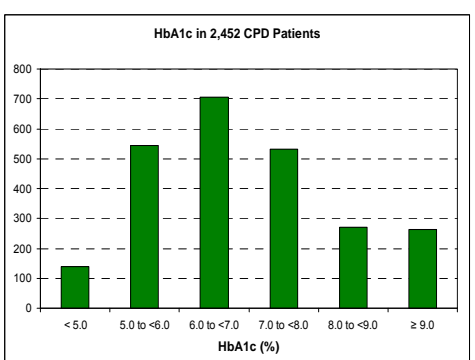
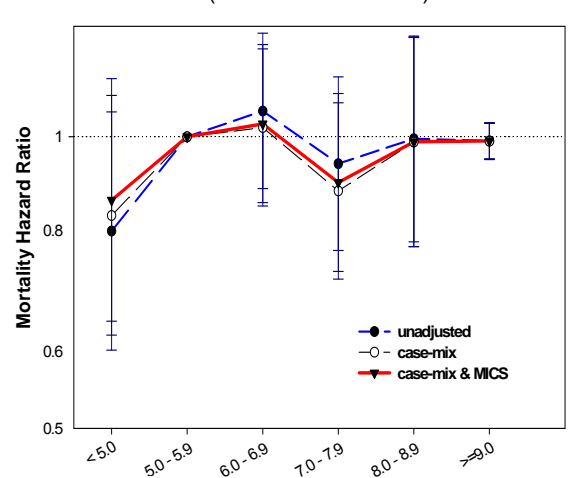
- We examined a large contemporary cohort of all CPD pts who underwent dialysis treatment for at least 3 months in any DaVita dialysis clinic during 7/2001-6/2004.
- In 2,878 CPD pts including 2,452 diabetics at least one A1c measure was available. Pts were 46.59.5 yrs old and included 45% women, 20% Blacks and 18% Hispanics.
- Cox models calculated both unadjusted and fully adjusted death hazard ratios (HR) and 95% confidence intervals (CI) for
  - Unadjusted model
  - Case-mix
  - Malnutrition-inflammation complex syndrome (MICS)

## Results

- Using continuous A1c in survival models, there was no association between A1c and survival.
- A1c was then categorized into 6 groups of <5%, >9% and 1% increments in-between, but no association was noted (Figure)
- A1c was then examined exclusively in diabetic CPD pts by categorizing A1c to <6%, 6-7.9%, 8-9.9% and 10%.
- A U-shaped trend with non-significant death hazard ratios (HR) was noted.
- When the A1c of 8-9.9% was used as the reference for its lowest death HR, the A1c10% had a 3-yr death HR (and 95%CI) of
  - Unadjusted: 1.17 (0.82-1.66),
  - Case-mix adjusted: 1.20 (0.84-1.71), and
  - MICS adjusted: 1.14 (0.80-1.62);

Baseline Variable in 7535 incident CPD pts

|                         |             |
|-------------------------|-------------|
| Number of patients      | 7,743       |
| Age (years)             | 46 ± 10     |
| >65 years old (%)       | 8           |
| Gender (% women)        | 48          |
| Diabetes mellitus (%)   | 48          |
| Race and ethnicity:     |             |
| Caucasians (%)          | 51          |
| Blacks (%)              | 23          |
| Asians (%)              | 6           |
| Hispanics (%)           | 15          |
| Primary insurance       |             |
| Medicare (%)            | 64          |
| Bicarbonate             | 24.2 ± 3.2  |
| nPCR or nPNA (g/kg/day) | 0.90 ± 0.27 |
| Serum albumin (g/dL)    | 3.63 ± 0.51 |
| creatinine (mg/dL)      | 8.9 ± 3.9   |
| ferritin (ng/mL)        | 381 ± 446   |
| Blood Hemoglobin (g/dL) | 11.7 ± 1.6  |
| WBC (per fl)            | 7.6 ± 2.7   |



| HbA1c ranges (units) | Group size (% total)* | All-cause death [% 3 yrs] | Cardiovascular death [% in 3 years] | Diabetes Mellitus [% in 3 yrs] | Hemoglobin A1c   | Baseline serum Alb (g/dL) |
|----------------------|-----------------------|---------------------------|-------------------------------------|--------------------------------|------------------|---------------------------|
| < 5.0                | 226 (8)               | 63 [28]                   | 25 [11]                             | 138 [61]                       | 4.62±0.25        | 3.6± 0.53                 |
| 5.0 to <6.0          | 695 (24)              | 202 [29]                  | 86 [12]                             | 544 [78]                       | 5.51±0.28        | 3.57± 0.48                |
| 6.0 to <7.0          | 784 (27)              | 254 [32]                  | 106 [14]                            | 706 [90]                       | 6.46±0.28        | 3.51± 0.48                |
| 7.0 to <8.0          | 589 (21)              | 104 [18]                  | 90 [15]                             | 531 [90]                       | 7.43±0.30        | 3.50± 0.46                |
| 8.0 to <9.0          | 297 (10)              | 94 [32]                   | 42 [14]                             | 272 [92]                       | 8.41±0.29        | 3.49± 0.44                |
| ≥ 9.0                | 287 (10)              | 85 [30]                   | 35 [12]                             | 264 [92]                       | 10.28±1.32       | 3.46± 0.45                |
| <b>All patients</b>  | <b>2,878</b>          | <b>862 [30]</b>           | <b>384 [13]</b>                     | <b>2455[85]</b>                | <b>6.87±1.61</b> | <b>3.52±0.48</b>          |

## Conclusions

In this national cohort of diabetic CPD patients A1c does not appear associated with survival.

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