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Risk factors and consequences of decreased kidney function in nursing home residents – a longitudinal study

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Background and Aim: Renal function declines with ageing and loss of renal function is associated with many adverse outcomes. Elucidating the role of decline in renal function outcomes for the elderly is challenging, and data on the performance of formulae for renal function estimation in very elderly patients are limited.

The aim of this study was to study the renal function and the relationship of deterioration in renal function with major outcomes in elderly nursing home residents. A second aim was to compare the internationally recommended formulae for estimated glomerular filtration rate (eGFR) consisting both creatinine and cystatin C in a nursing home population.

Methods: 429 patients from 11 nursing homes were included during 2008-2011. GFR was estimated, from formulae based on both creatinine and cystatin C, at baseline and after 1 and 2 years. The patients were divided into groups based on CKD (chronic kidney disease) level, and comparisons were made for mortality, morbidity, the use of medications and between the different formulae for eGFR.

Results: Survival was significantly lower in the groups with lower renal function ($p < 0.001$). Over 60 % of the residents had impaired renal function. Those with impaired renal function were older, had a higher number of medications and a higher prevalence of heart failure. Higher numbers of medications, were associated with a greater risk of rapid decline in renal function with an OR of 1.2 (95% CI 1.06-1.36, $p = 0.003$). The compared eGFR formulae were in excellent concordance.

Conclusions: Decreases in renal function were associated with increased mortality. A majority of nursing home residents had declining renal function which should be considered when prescribing medications. The more medications, the higher the risk for rapidly declining renal function. The equations for eGFR, recommended by national Swedish guidelines were in excellent agreement with CKD-EPI formula.