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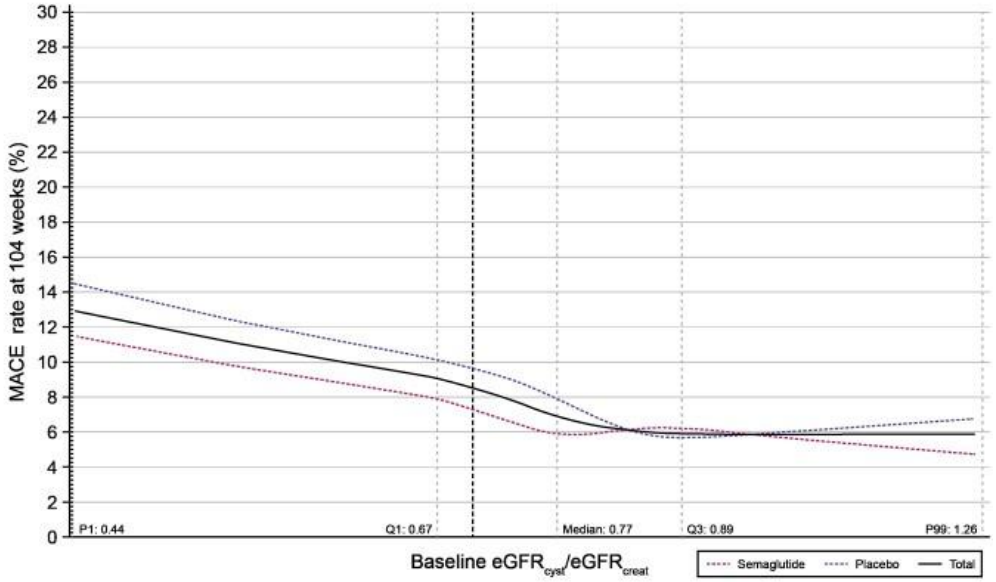
Discordance Between Cystatin C-Based eGFR and Creatinine-Based eGFR and Cardiovascular Risk in the FLOW Trial

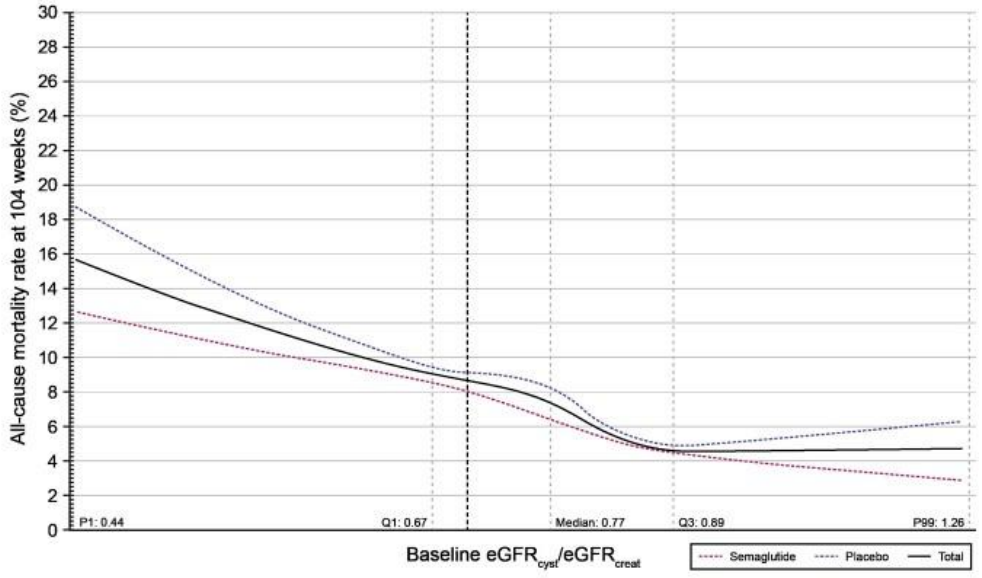
Jihyun Kim[1], Inga Soveri[2], Johannes F Mann[3], Richard E Pratley[4], Roland E Schmieder[5], David Cherney[6], Richard J MacIsaac[7], Peter Rossing[8], Kenneth W Mahaffey[9]
[1]Department of Medical Affairs, Novo Nordisk, Korea, Republic of
[2]Department of Department of Medical Sciences, Uppsala University, Sweden
[3]Department of Internal Medicine-Nephrology, KfH Kidney Centre, Germany
[4]Department of Internal Medicine, AdventHealth Translational Research Institute, United States
[5]Department of Internal Medicine, University Hospital Erlangen, Germany
[6]Department of Internal Medicine, University of Toronto, Canada
[7]Department of Department of Endocrinology & Diabetes, St Vincent's Hospital, Australia
[8]Department of Internal Medicine, Steno Diabetes Center Copenhagen, Denmark
[9]Department of Stanford Center for Clinical Research, Department of Medicine, Stanford School of Medicine, United States

Objectives : Superiority of estimated glomerular filtration rate $(eGFR)_{cystatin\ C}$ ($eGFR_{cyst}$) over $eGFR_{creatinine}$ ($eGFR_{creat}$) in cardiovascular risk prediction is established but incompletely understood. It has been hypothesized that low $eGFR_{cyst}$ may be reflecting selective glomerular hypofiltration, characterized by reduced clearance of middle-sized, potentially atherogenic proteins. We analyzed associations of $eGFR_{cyst}/eGFR_{creat}$ with major adverse cardiovascular events (MACE) and all-cause mortality in participants of the FLOW trial
Methods : GFR was estimated using the CKD-EPI 2009 ($eGFR_{creat}$) or 2012 ($eGFR_{cyst}$) equations. Time to first event was studied using Cox regression. Baseline $eGFR_{cyst}/eGFR_{creat}$ <0.7 vs ≥0.7 was a fixed factor and adjusted for $eGFR_{cyst}$ and/or $eGFR_{creat}$.
Results : Of the 3463 participants, 1116 (32%) had $eGFR_{cyst}/eGFR_{creat}$ <0.7 at baseline (median 0.77) (Figure). Median follow-up was 3.4 years. $eGFR_{cyst}/eGFR_{creat}$ <0.7 was associated with increased risk of MACE and all-cause mortality (unadjusted hazard ratios [95% confidence interval] of 1.58 [1.31−1.90] and 1.87 [1.57−2.23], respectively). The association was preserved after adjustment for baseline $eGFR_{cyst}$ and/or $eGFR_{creat}$, with slight attenuation of effect.
Conclusions : In FLOW, $eGFR_{cyst}/eGFR_{creat}$ <0.7 was associated with substantially increased risk for MACE and all-cause mortality in participants with type 2 diabetes and chronic kidney disease, independent of $eGFR_{cyst}$. Further research is needed to elucidate potential treatment targets.

A. Predicted MACE event rate by week 104 according to eGFR ratio at baseline.jpg



A. Predicted MACE event rate by week 104 according to eGFR ratio at baseline.jpg



eGFR, estimated glomerular filtration rate; MACE, major adverse cardiovascular events.
Prediction from a Cox spline regression model with eGFR ratio as a continuous variable.