Effect of Cardiovascular risk factors on Kidney function decline in post-MI patients: Alpha Omega Cohort

Kevin Esmeijer[1,2], Johanna M. Geleijnse[3], Johan W. de Fijter[1], Erik J. Giltay[4], Daan Kromhout[3,5], Ellen K. Hoogeveen,[1,2,6]

1. Dept of Nephrology, LUMC, Leiden, 2. Dept of Epidemiology, LUMC, Leiden, 3. Division of Human Nutrition, Wageningen University, Wageningen, 4. Dept of Psychiatry, LUMC, Leiden, 5. Dept of Medical Sciences, University Medical Center Groningen, Groningen, 6. Dept of Nephrology, Jeroen Bosch Hospital, Den Bosch, all in the Netherlands

Background

Kidney function is a robust risk factor for cardiovascular mortality.(1) The age-related annual kidney function decline of about 1.0 ml/min/1.73m^2 after age 40 years, is doubled in post-myocardial infarction (MI) patients.(2) Post-MI patients are thus more prone to develop CKD. Importantly, due to global ageing and unhealthier lifestyle, these patients represent a substantial number of patients. Classic modifiable cardiovascular risk factors such as diabetes, hypertension, obesity and smoking are important drivers for development of CKD. Little is known about the beneficial effect of optimal treatment of these risk factors in post-MI patients.

Objective: Investigate the effect of cardiovascular risk factors including healthier lifestyle on kidney function decline in older post-MI patients on state-of-the-art drug-treatment

Design & Methods

This prospective cohort study is a follow-up of the Alpha Omega Trial: 2,426 post MI-patients with cardiovascular drug-treatment according to the latest guidelines, followed for 41 months.

- Individual slopes of cystatin C based eGFR (CKD-EPI 2012) decline were calculated, based on serum cystatin C measurements at baseline and after 41 months.
- ANCOVA to assess the effect of cardiovascular risk factors on annual $eGFR_{cysC}$ decline
- Investigated risk factors and definitions:

Diabetes (self-reported diagnosis, glucose-lowering drugs use, elevated plasma glucose)
High blood pressure (BP ≥140/90 mmHg, irrespective of medication)
High LDL (≥2,5 mmol/l) **Current smoking** (of cigarettes) **Obesity** (BMI ≥30,0 kg/m^2)

Baseline characteristics	N=2,426
Age, years	69 ± 5
Men	79%
Time since MI, yr	4.5 ± 3.2
eGFR, ml/min/1.73m^2	81.5 ± 19.6
Current smoking	16%
BMI, kg/m^2	27.7 ± 3.6
Obese	23%
High WC	57%
Systolic BP, mmHg	143 ± 21
High Blood pressure	56%
BP-lowering drugs	87%
Diabetes	19%
Glucose-lowering drugs	13%
LDL, mmol/l	2.7 ± 0.8
High LDL	56%
Statins	85%

Conclusions

- Cardiovascular risk factors were associated with progressive eGFR loss in post-MI patients. Greatest impact with DM and high BP.
- Annual $eGFR_{cysC}$ decline: No risk factors: -0.9 ml/min, ≥3 risk factors: 2.5-fold increased decline

Results

Annual eGFR decline (95%-CI) ml/min/1.73m^2			
Diabetes*	No	**-1.2**	-1.3; -1.0
	Yes	**-2.1**	-2.4; -1.8
High BP*	No	**-1.0**	-1.2; -0.8
	Yes	**-1.5**	-1.7; -1.4
High LDL	No	**-1.5**	-1.7; -1.3
	Yes	**-1.3**	-1.5; -1.1
Cigarette smoking	Never	**-1.1**	-1.4; -0.8
	Former	**-1.3**	-1.4; -1.1
	Current	**-1.4**	-1.8; -1.1
Obesity	No	**-1.3**	-1.5; -1.2
	Yes	**-1.6**	-1.9; -1.3

Adjusted for randomization group, age, sex, smoking, alcohol use, education, physical activity
Diabetes was also adjusted for obesity and LDL
High BP was also adjusted for obesity, diabetes and LDL
LDL was also adjusted for diabetes and obesity

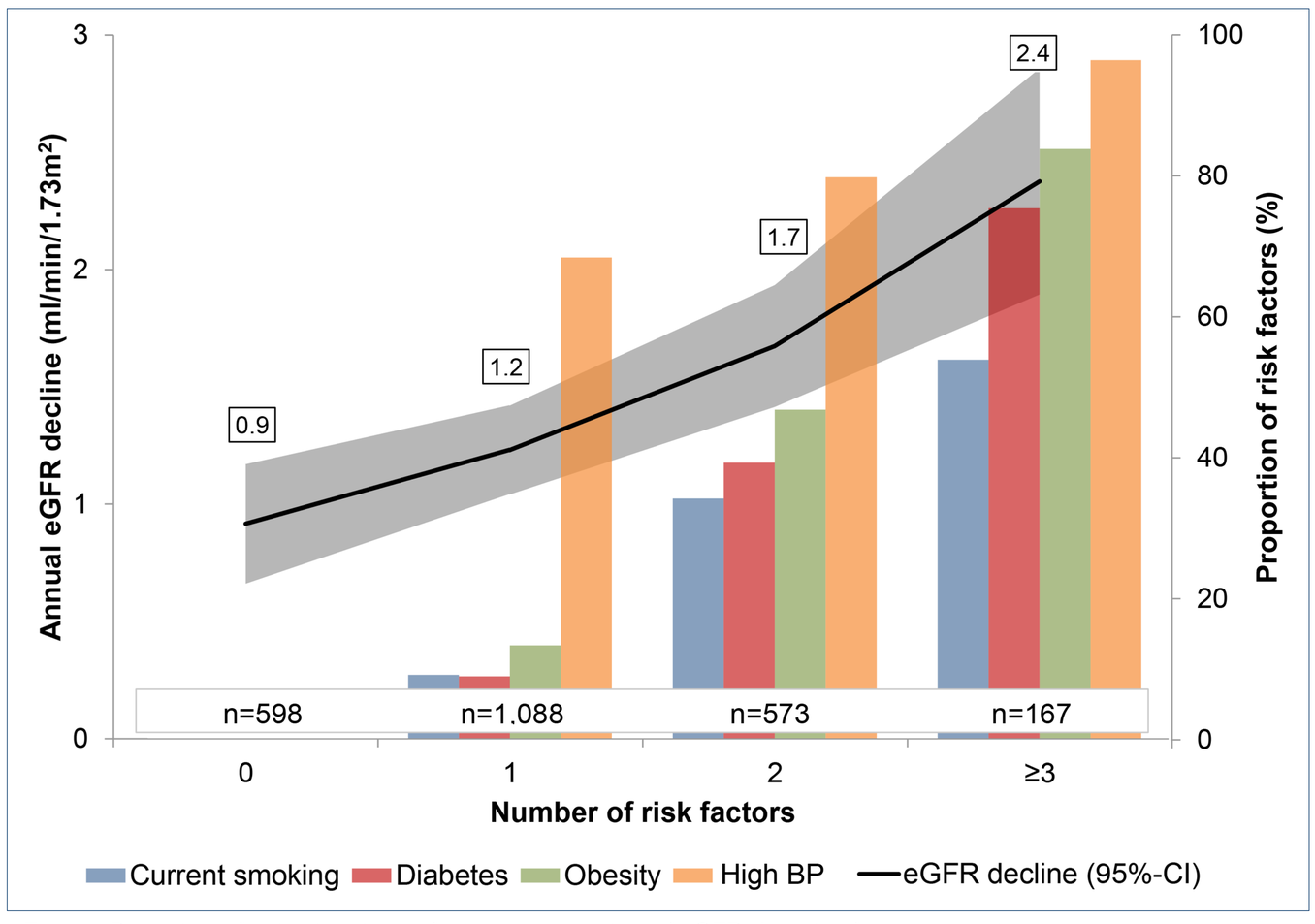

Figure: Proportion of patients with risk factors and evolution of eGFR. Adjusted for randomization group, age, sex, education and alcohol use.

References 1. Hoogeveen et al. *PLoS One* 2017. 2. Eijkelkamp et al. *Am J Cardiol* 2007.

Corresponding author: k.esmeijer@lumc.nl

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Kevin Esmeijer

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