CORRESPONDENCE

The Prevalence of Renal Failure—Results From the German Health Interview and Examination Survey for Adults, 2008–2011 (DEGS1)

by Prof. Dr. med. Matthias Girndt, Dr. med. vet. Pietro Trocchi, Dr. med. Christa Scheidt-Nave, Dr. med. Silke Markau, and Prof. Dr. med. Andreas Stang, MPH, in issue 6/2016

Examination Survey for Adults, 2008–2011 (DEGS1). Dtsch Arztebl Int 2016; 113: 85–91.

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Need to Rethink

The publication of population-based data from the DEGS1 adds scientific value. These data supplement population-based data from Germany which have already systematically been used by European (1) and other global consortia (Chronic Kidney Disease Prognosis Consortium) (2). The available data show that the estimated prevalence, especially among the relevant age groups, is significantly higher when the glomerular filtration rate is estimated (eGFR) solely on the basis of creatinine-based methods. Consequently, a significant number of, especially older, patients is classed incorrectly. In the age group 70–79 years, prevalence can easily be overestimated by factor two to three (3). The DEGS1 already followed the recommendations of the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) working group and used the combination of serum creatinine levels and serum cystatin C levels (2). This method has not yet found the widespread adoption into both clinical practice and research it deserves. However, according to recent data, estimating GFR based on cystatin C levels results in a more accurate classification, regardless whether it used alone or in combination with creatinine levels (2, 3). This level of accuracy is required, on the one hand, to arrive at a valid estimate of the burden of renal failure in the population and, on the other hand, to support patients in diagnostic and therapeutic decision making. It is true that the creatinine-based diagnosis of renal failure has a long tradition and is very cost-effective, but, according to the extensive available data, the time appears to be ripe for combining cystatin C, for which a globally defined reference standard is now available, with the traditional method in certain situations.

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Uncritical Use of Estimating Equations

With my doctoral thesis in nephrology and my practice as a family physician, I looked forward to this article on renal failure (1). In my opinion, there is nothing wrong with both the study and the article, except for the uncritical application of creatinine-based renal function estimating equations on all strata of the population. The currently favored Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation from 2009 may have less shortcomings than the Modification of Diet in Renal Disease (MDRD) equation from 1989, but it does not require to specify body weight, while it includes skin color. The algorithm takes darker skin color into account to allow for associated greater muscle mass which correlates with creatinine levels. The Cockcroft-Gault equation takes weight into account, but nowadays, it is considered obsolete for more reasons than just its poor validation (developed in 1973 based on data from 249 male subjects). Furthermore, the average person in Mecklenburg may be underrepresented with a reference body surface of 1.73 m². This would be no more than a minor annoyance, medically overcome with ease, if it weren't for the fact that, due to pharmacovigilance requirements, the glomerular filtration rate has rightfully found its way into clinical routine and the precise representation of renal function has become essential, not only for medicolegal reasons. I think the e(stimated) GFR, based on serum creatinine levels, is not precise enough, especially in heavy and muscular persons, but also in underweight, cachectic patients. In my opinion, an individualized view on renal function, considering further factors (such as build, development over time) would make better sense.

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In Reply

We would like to thank Prof. Rothenbacher and Prof. Koenig for their letter in response to our article. Indeed, our concern was to avoid overestimating the prevalence of patients with a reduced glomerular filtration rate. For this reason, we used the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation in combination with cystatin C levels.

With regard to Dr. Schneider's argument that the calculation model used does not adequately take into account the body composition of the population under investigation, it should be noted that exactly this issue was addressed by including cystatin C levels in addition to serum creatinine levels. In line with the considerations mentioned above, it seems reasonable to call for an increased use of cystatin C testing in clinical routine, particularly in view of the pharmacological aspects.

From a historical perspective, it is understandable that the glomerular filtration rate was based on a standard body surface of 1.73 m², as this was the average body surface of 25-year-old men and women in the US in 1927 (1). However, as outdated as it may appear, the actual figure for the standard value is irrelevant, as it is arbitrarily chosen. But we think it is important that epidemiological studies continue to use the internationally

agreed standard, for the very reason that, otherwise, the range of normal values of the estimated glomerular filtration rate would need to be defined for each population individually. However, on the level of managing individual patients, it may make sense to use a non-standardized value, accounting for height, weight and muscle mass.

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Conflict of interest statement

The authors of all contributions declare that no conflict of interest exists.