

Spot versus overnight urine as an alternative for 24-hour urine collection to assess sodium intake

To the Editor:

In the recent review by Ji and colleagues titled, "Systematic review of studies comparing 24-hour and spot urine collections for estimating population salt intake" (1), the authors investigated whether several methods of partial urine collection, including spot and overnight collection, could be an alternative to 24-hour collection for assessing sodium intake. The authors concluded that it is unclear whether alternative methods, such as spot and overnight urine collection, provide a reliable estimate of the 24-hour sodium excretion.

High dietary sodium is a risk factor for hypertension and cardiovascular disease. Therefore, low-sodium diets have been recommended, and self-monitoring of sodium intake might improve adherence to a healthier diet. The gold standard for assessing sodium intake has been the 24-hour urine collection method (1). However, this method is thought to have major limitations, in particular for individuals who work outside the home, with a failing rate of up to 40% (2). As such, it may lead to incorrect estimations of actual sodium intake. Therefore, alternative strategies with partial urine collection, such as random spot daytime urine collection, urine collection prior to the evening meal, and overnight urine collection have been proposed (2, 3).

In 2010, at the 20th Meeting of the European Society of Hypertension in Oslo, we presented our systematic review on spot versus overnight urine in comparison with 24-hour urine to estimate sodium intake (3). Overnight urine sodium showed a significant correlation with 24-hour urine sodium, with a correlation coefficient of 0.6 to 0.9 (weighted mean 0.8; $P < 0.05$), while sodium excretion in spot urine correlated poorly with 24-hour urine sodium, with a correlation of 0.1 to 0.5 (weighted mean 0.4; $P > 0.05$) (3).

Ji and colleagues also reported spot versus overnight urine, but the authors did not pool the data. The authors proposed no formal statistical test to substantiate this decision. Notably, the authors did not report having followed a rigid systematic review methodology (4, 5). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement is focused on trials, but the checklist is also intended to be used as a basis for reporting systematic reviews of other types of research (4). As such, systematic reviews of diagnostic tests should also be subjected to this rigid methodology (5), which characterizes the 'systematic' part of the review and is aimed at minimizing bias. In particular, Ji and colleagues did not state that the methods of handling the data and data synthesis were pre-specified, following international guidelines, or whether the decision to not aggregate the data was

made *a priori* or *post hoc*, after viewing the search yield. The authors also did not report to have pre-specified the subgroup analyses used in the paper. This apparent lack of a rigid methodology might have introduced the bias that a systematic review aims to avoid (4, 5), in particular pertaining to the pooling of data of overnight versus random spot urine collection.

Based on the available data, including our review, a recent report, and the description of the studies including studies by Ji and colleagues (1–3), we infer that not pooling random spot versus overnight urine collection potentially masked the high correlation between overnight collection and 24-hour urine collection. The available data (1–3) well indicate that overnight, but not spot urine sodium, has a strong correlation with 24-hour urine sodium, and that overnight collection could be an acceptable alternative to the gold standard of 24-hour collection.

Inna Khoyska

Department of Vascular Medicine
Academic Medical Center
University of Amsterdam
Amsterdam, the Netherlands

Madina Sarwari

Department of Vascular Medicine
Academic Medical Center
University of Amsterdam
Amsterdam, the Netherlands

Lizzy M. Brewster

Department of Vascular Medicine
Academic Medical Center
University of Amsterdam
Amsterdam, the Netherlands
Email: l.m.brewster@amc.uva.nl

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