

Evaluation of osmolar diuresis as a strategy to increase diagnostic sensitivity in acute kidney injury

Dear Editor:

Diuresis constitutes the most important and simple clinical parameter of renal function obtained from clinical practice, both in adult and pediatric patients.¹ Usually from diuresis is evaluated the magnitude of its flow (volume emitted per unit of time), considering as insufficient diuresis (oliguria) a urinary flow ≤ 17 ml/hour (400 ml/day), and as excessive diuresis (polyuria) a urinary flow ≥ 125 ml/hour (3000 ml/day).²

However, there is a way to evaluate diuresis different from that, which is even the most appropriate from a physiological point of view, and that is to determine the patient's urine osmolar excretion or osmolar diuresis. This parameter is based on the fact that there is a close relationship among the amount of osmoles that the organism has to excrete daily through urine, urinary osmol concentration, and the urinary flow necessary to achieve this osmol excretion (osmolar diuresis). This relationship is expressed by the following equation:

$$\text{osmolar diuresis} = \text{urinary osmolar daily excretion} / \text{urine osmolar concentration}$$

For instance, based on the above mentioned equation, since an individual on a Western diet requires a daily urine excretion of around 750 mOsm (600-900 mOsm), if his urinary osmolarity is 400 mOsm/L, then his osmolar diuresis should be: $78 (\pm 16)$ ml/hour (1.875 ± 0.4 L/day).

$$1.875 \text{ L/day (78 ml/hour)} = 750 \text{ mOsm/day} / 400 \text{ mOsm/L}$$

This implies that, if in this patient whose expected osmolar diuresis is 78 ± 16 ml/hour (1.875 ± 0.4 L/day), a urinary flow > 94 ml/hour (2256 ml/day) would be a relative polyuria, whereas a urinary flow < 63 ml/hour (1512 ml/day) would be a relative oliguria, regardless of the classical criterion used (urinary flow) to define polyuria (≥ 3000 ml/day) and oliguria (≤ 400 ml/day).

Of course, it would be necessary to determine first what would be the osmolar load that the patient to evaluate requires to excrete daily by urine, since there are clinical states (eg: catabolic, etc.) where the osmolar load to be excreted can be higher than the standard (600-900 mOsm/day).

For this reason, we propose here that in all

those clinical situations that usually require an adequate evaluation of diuresis, such as the early detection or monitoring of acute kidney injury (AKI), should not be merely evaluated the patient's urinary flow but mainly the patient's osmolar diuresis. In this sense, if patient's osmolar diuresis does not coincide with his urinary flow, and early AKI could be suspected, either secondary to an early glomerular injury (relative oliguria) or tubulo-interstitial injury (relative polyuria secondary to nephrogenic diabetes insipidus).

We conclude that the evaluation of osmolar diuresis could be extremely useful to achieve early diagnosis and monitoring of acute kidney injury in the critical adult or pediatric patients. ■

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World Kidney Day 2019

Dear Editor:

On behalf of the World Kidney Day (WKD) 2019 Steering Committee, we are submitting to you directly a manuscript entitled – 'Burden, Access, and Disparities in Kidney Disease' - the official WKD Editorial for 2019.

We believe this paper provides an excellent summary and rationale for WKD 2019, with the focus on the universal health coverage for kidney disease.

850 million people worldwide are now estimated to have some form of kidney disease. Despite a heavy burden of End Stage Kidney Disease (ESKD) in low- and middle-income countries, approximately 80% of the world's dialysis and transplant patients live in Europe, Japan, or North America.

This year's theme offers an excellent opportunity to highlight the burden of kidney disease and disparities in access to care for kidney disease patients, as well as to attract more attention to the issue. In its 14th campaign, World Kidney Day promotes Kidney Health for Everyone Everywhere.

The editorial is co-written by Deidra Crews, Aminu Bello, and Gamal Saadi, on behalf of the World Kidney Day Steering Committee.

We hope to time the publication of the manuscript with the February or March issue of your journal, so it will be published close to World Kidney Day on March 14th, 2019. Please note that the article is under embargo until February 2019 and is being submitted simultaneously to a wide range of medical journals, including leading nephrology journals.

This manuscript is written every year by nephrologists working for the campaign on a voluntary basis. They receive neither grants nor prizes yet dedicate their time to the valuable cause that this campaign champions. World Kidney Day is not in a position to pay any fee; therefore, we are also asking for a fee waiver.

As a reflection of the worldwide support for this international event, the WKD 2018 editorial was published in over 50 journals worldwide. I am sure you appreciate why we ask for a complete fee waiver.

We hope to count on you in 2019.

Please address all correspondence related to this paper to Jo-Ann Donner at WKD headquarters: jdonner@theisn.org. Thank you in advance for your consideration and support for World Kidney Day 2019.

Sincerely yours,

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