Differing definitions of contrast-induced nephropathy

To the editor:
We read with great interest the original article by Mueller et al. [1]. They found that applying the combination of intravenous and oral volume supplementation results in a very low incidence of contrast-induced nephropathy (CIN).

Mueller et al. noted that the incidence of CIN is 1.4% and this incidence is lower than that previously reported in similar patient populations and supply 17 references to support this. When we looked at the references we found that the patient population in these references was not similar to that studied by Mueller et al. With one exception, all of the study patients in the references had impaired renal function. However, in the study by Mueller et al. the baseline serum creatinine was normal (0.91 mg/dl). Pre-existing renal insufficiency is the most important risk factor for CIN. The incidence of CIN is less than 2% in the general population with normal baseline creatinine value but it is more than 20% in patients with an increased baseline serum creatinine level [2]. Another important point in these 17 references was that only three of the referenced studies used the definition of CIN as a rise in serum creatinine of ≥0.5 mg/dl above the baseline value. The other studies used both a ≥25% and a ≥0.5 mg/dl rise in serum creatinine or a ≥25% increase in serum creatinine alone. CIN is commonly defined as a rise in serum creatinine of ≥25% or ≥0.5 mg/dl above the baseline value within 48 h after contrast administration [3]. The incidence rates of CIN are sensitive to the definition used. The incidence of CIN is less than 25% or ≥25% increase in serum creatinine and the incidence of CIN decreased to 3.9% when they use the definition of an increase in serum creatinine of at least 0.5 mg/dl within 48 hours after the PCI as Mueller et al. used in their study.

For this reason, the method used in the study by Mueller et al. does not permit a discussion on the effect of the combination of intravenous and oral volume supplementation on the development of CIN and they cannot conclude that their comprehensive hydration strategy is responsible for the low incidence of CIN.

Correspondence:
Omer Toprak, MD
Department of Medicine
Division of Nephrology
Vanderbilt University School of Medicine
1161 21st Avenue South
and Garland, S-3223 MCN
Nashville, TN 37232-2372
USA
E-Mail: info@omertoprak.com

References

Author’s reply:
We fully agree with Dr. Toprak that the incidence of contrast-induced nephropathy (CIN) is sensitive to the definition used. The definition of CIN applied in our study (increase in serum creatinine of at least 0.5 mg/dl within 48 hours) is very common. The incidence of CIN in our study (1.4%) was lower than reported in other studies applying an identical definition of CIN and including comparable patients [1–3]. Rates observed in these studies range from 3.3% to 18.9% [1, 3]. When evaluating studies regarding the incidence of CIN, it is important to note that besides baseline renal function, several other variables including acute myocardial infarction, contrast volume, and the frequency and completeness of serum creatinine measurements after the contrast procedure determine the rate of CIN [1]. However, we fully agree with Dr. Toprak that our results have to be seen in conjunction with the results of recent randomized controlled trials of volume supplementation in order to fully appreciate the importance of comprehensive intravenous and oral volume supplementation [3, 4].

Christian Mueller, MD, FESC
University Hospital Basel
Petersgraben 4
CH-4031 Basel
E-Mail: chmueller@rub.ch

References
The many reasons why you should choose SMW to publish your research

What Swiss Medical Weekly has to offer:

- SMW’s impact factor has been steadily rising, to the current 1.537
- Open access to the publication via the Internet, therefore wide audience and impact
- Rapid listing in Medline
- LinkOut-button from PubMed with link to the full text website http://www.smw.ch (direct link from each SMW record in PubMed)
- No-nonsense submission – you submit a single copy of your manuscript by e-mail attachment
- Peer review based on a broad spectrum of international academic referees
- Assistance of our professional statistician for every article with statistical analyses
- Fast peer review, by e-mail exchange with the referees
- Prompt decisions based on weekly conferences of the Editorial Board
- Prompt notification on the status of your manuscript by e-mail
- Professional English copy editing
- No page charges and attractive colour offprints at no extra cost

Editorial Board
- Prof. Jean-Michel Dayer, Geneva
- Prof. Peter Gehr, Berne
- Prof. André P. Perruchoud, Basel
- Prof. Andreas Schaffner, Zurich (Editor in chief)
- Prof. Werner Straub, Berne
- Prof. Ludwig von Segesser, Lausanne

International Advisory Committee
- Prof. K. E. Juhani Airaksinen, Turku, Finland
- Prof. Anthony Bayes de Luna, Barcelona, Spain
- Prof. Hubert E. Blum, Freiburg, Germany
- Prof. Walter E. Haefeli, Heidelberg, Germany
- Prof. Nino Kuenzli, Los Angeles, USA
- Prof. René Lutter, Amsterdam, The Netherlands
- Prof. Claude Martin, Marseille, France
- Prof. Josef Patsch, Innsbruck, Austria
- Prof. Luigi Tavazzi, Pavia, Italy

We evaluate manuscripts of broad clinical interest from all specialities, including experimental medicine and clinical investigation.

We look forward to receiving your paper!

Guidelines for authors:
http://www.smw.ch/set_authors.html

All manuscripts should be sent in electronic form, to:

EMH Swiss Medical Publishers Ltd.
SMW Editorial Secretariat
Farnburgerstrasse 8
CH-4132 Muttenz

Manuscripts: submission@smw.ch
Letters to the editor: letters@smw.ch
Editorial Board: red@smw.ch
Internet: http://www.smw.ch