Furosemide Induced Natriuresis in Advanced Renal Failure

M.		Labeeuw
N.		Pozet
P.		Zech
J.		Traeger

M. Labeeuw, Service de Néphrologie-Dialyse, Centre Hospitalier, F-71321 Chalon-sur-Saône (France); N. Pozet, P. Zech, J. Traeger, Pavillon P, Hôpital E. Herriot, Lyon (France)

Dear Sir,

Prof. O. Schück [Nephron 30: 95–96, 1982] suggested that in patients with advanced renal failure developing positive sodium balance, FeNa should be investigated. He found that the increase in FeNa (ΔFeNa) following furosemide administration was only minimal when basal FeNa values were over 16% and stated that, in this situation, furosemide was likely to be useless. Seven years ago we investigated [1] the efficacy of furosemide (250 mg i.v.) in 92 patients with various levels of GFR measured by inulin clearance. As Prof. Schück, we also found the already previously reported [2] negative relationship between basal FeNa and GRF. However, in our experience, FeNa increased following furosemide even for high basal FeNa values. For FeNa above 14%, ΔFeNa averaged 19.86% (range 7–37). A positive correlation was established between FeNa values before (pre-F-FeNa) and after (post-F-FeNa) furosemide administration ($\text{post-F-FeNa}\% = 27.61 + 0.83 \text{ pre-F-FeNa}$, $r = 0.349$, $p < 0.001$). Thus, post-F-F β Na values were the highest in patients with already elevated pre-F-FeNa values. Multivariate analysis showed that pre-F-FeNa, post-F-FeNa, and GRF were significantly correlated and that post-F-FeNa and pre-F-F β Na remained positively correlated ($r = 0.360$, $p < 0.001$) when corrected for GFR. We therefore concluded that the efficacy of furosemide was retained even in patients with low GFR and high values of pre-F-FeNa.

We showed that both the nature of primary renal disease and the previous salt intake, but not blood pressure, influenced pre-F- and post-F-F β Na values. For example, in hypertensive patients submitted to sodium-restricted diet, pre-F- and post-F-FeNa were lower in those with glomerulonephritis than in those with interstitial nephritis, but ΔFeNa were similar (28.75 ± 8.42 vs. 30.24 ± 11.52). Therefore, although these parameters are well worth considering, they are unlikely to be the cause of the discrepancies between Prof. Schück's results and ours.

More recently, we reported similar findings following piretanide administration [3] in patients with low GFR (8.4 ml/min) and high FeNa (14.27%). Therefore, we would advocate testing for furosemide efficacy, even in patients with end-stage renal failure and high basal FeNa values.

References

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