Method of Blood Collection May Explain the Suppression of Plasma Renin Concentration in Prorenin Transgenic Mice

To the Editor:

Mercure et al reported the targeted expression of mouse prorenin to the liver of mice. Liver expression of mouse prorenin was under the control of the transthyretin gene promoter, and plasma prorenin levels of these TTRmProren transgenic mice were increased by 13- to 28-fold. TTRmProren mice with 28-fold elevation of prorenin levels had hypertension and cardiac hypertrophy, but there was no increase in cardiac fibrosis or glomerular sclerosis in these mice. This study is an important contribution to the understanding of the role of prorenin in cardiac and renal pathology.

Mercure et al also reported that TTRmProren mice had lower plasma renin levels than wild-type littermate controls, and the authors extensively discussed the possible reasons for, and significance of, this finding. They did not, however, acknowledge the importance of methodology in renin measurement. Moreover, the authors failed to describe the methods of anesthesia and blood collection, the use of inhibitors, and the storage of plasma before renin measurement in their study.

It is of note that the TGR(mRen-2)27 rat was originally reported as a model of "low-renin" hypertension. Subsequent studies showed the TGR(mRen-2)27 rat to have elevated plasma renin levels, and this discrepancy was explained by differences in anesthesia used for the collection of blood for renin measurement. It is well recognized that anesthetics, eg, ether and pentobarbital, increase plasma renin levels. Moreover, the TGR(mRen-2)27 rat, which has suppressed renal renin content, is less able to increase plasma renin levels in response to stress. Thus, when blood is collected under the stress of ether anesthesia, as performed by Mullins et al, renin levels in control rats may increase to levels higher than in TGR(mRen-2)27 rats, thereby giving the false impression that the TGR(mRen-2)27 rat is a model of low-renin hypertension. A similar effect of method of blood collection on plasma renin levels may explain the apparent suppression of renin levels in TTRmProren mice described by Mercure et al.

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