Hormonal Mechanisms

6.8 Application of a New Chemiluminescent Method for Direct Renin Measurement to the Calculation of Aldosterone/Renin Ratio in Patients with Essential Hypertension

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Introduction. Aldosterone/renin ratio (ARR) is increasingly used for the diagnosis of primary hyperaldosteronism with aldosterone (A) values expressed in ng/dl and renin (R) measured as plasma renin activity (PRA, ng/ml/h) with an enzymatic technique. However, a new chemiluminescent immunoassay (CLIA) has recently been developed as an alternative to the enzymatic method for the direct quantification of R expressed in mU/dl.

Methods. In 45 patients with essential hypertension, 17 off treatment with ACE inhibitors or angiotensin receptor antagonists (no-ACEIs/ARBs) and 28 on chronic treatment with ACEIs or ARBs, we compared ARR with R measured as PRA or as direct immunoreactive R (ARRE and ARRD) in plasma samples collected both in the supine position (S) and after 1 hour of active standing (AS).

Results. In the 17 no-ACEIs/ARBs patients, ARRE in S was 15 ± 3 (range 1-63) and increased to 28 ± 8 (3-141) after AS, the corresponding values of ARRD being 5.1 ± 1.4 (0.5-24.2) and 9.4 ± 2.6 (1.1-41.5). In the 28 patients on treatment with ACEIs/ARBs ARRE was 16 ± 5 (1-140) in S and 23 ± 8 (0-181) after AS, the corresponding values of ARRD being 5.2 ± 1.5 (0.3-34.1) and 7.9 ± 2.9 (0.2-69.6). Both in S and after AS ARRE and ARRD values were significantly correlated (respectively $r = 0.89$ and 0.89 for no-ACEIs/ARBs patients, 0.91 and 0.96 for patients on treatment with ACEIs or ARBs, $p < 0.01$ for all correlations).

Conclusions. These data provide the reference limits for ARRD in patients with essential hypertension and demonstrate that, independently of posture and treatment with renin-angiotensin system antagonists, the calculation of ARR with direct CLIA gives results comparable to and correlated with those obtained using PRA.