Kidney

6.6 A New Chemiluminescent Immunoassay for the Determination of Renin in Human Plasma: Comparison with the Enzymatic Method

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Objective: Renin (R) is usually measured as plasma renin activity (PRA, ng/ml/h) with an enzymatic method which has the limit of being time consuming. CLIA is a new method which allows the quantification of immunoreactive R (µU/ml) within 30 minutes via the count of the relative light units (RLU) generated by the reaction of an isoluminol molecule bound to the monoclonal antibody against R.

Methods: In 51 patients (pts) with essential hypertension (age 13-80 years, 32 on treatment with ACEIs or ARBs) we measured PRA and CLIA-R in blood samples collected in the supine position and after 1 h of active standing.

Results: Supine PRA and CLIA-R were respectively 1.2 ± 0.3 (range 0.1-8.2) and 40 ± 11 (range 1.4-500) and rose to 2.4 ± 0.4 (range 0.1-16) and to 59 ± 13 (range 1.5-500) in the upright position ($p<0.01$ for both). Supine and upright PRA and CLIA-R were significantly correlated ($r = 0.89$ and 0.82 respectively, $p<0.01$), as well as their standing induced increments ($r = 0.68$, $p<0.01$). However, when considering overall data (n=102), we found that the r value of the correlation among samples in the lower tertile was 0.51 and increased to 0.62 and 0.74 respectively in the middle and upper tertiles. In the 19 pts not on treatment with ACEIs and ARBs supine PRA and CLIA-R were respectively 0.7 ± 0.2 and 21 ± 6 and rose to 1.3 ± 0.4 and 32 ± 10 in the upright position and the r values of the PRA/CLIA-R correlations were respectively 0.94 and 0.98 ($p<0.01$). In these 19 pts plasma aldosterone (A, pg/ml) rose from the supine to the upright position from 69 ± 14 to 155 ± 24 ($p<0.01$), the standing induced changes in PRA and CLIA-R (n=38) being both correlated with those in A ($r = 0.44$ and 0.51, $p<0.01$).

Conclusions: Thus CLIA is a reliable alternative to PRA for the fast determination of R particularly in pts off treatment with ACEIs/ARBs and reflects, like PRA, the stimulating effects of R on A. However the correlation between PRA/CLIA-R is clearly better for values in the intermediate-high range than for those in the low range.