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Angiotensin II Type 1 Receptor Autoantibodies in Postural Tachycardia Syndrome.

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BACKGROUND:

Both the adrenergic and renin-angiotensin systems contribute to orthostatic circulatory homeostasis, which is impaired in postural orthostatic tachycardia syndrome (POTS). Activating autoantibodies to the α1-adrenergic and β1/2-adrenergic receptors have previously been found in sera from patients with POTS. We hypothesized that patients with POTS might also harbor activating autoantibodies to the angiotensin II type 1 receptor (AT1R) independently of antiadrenergic autoimmunity. This study examines a possible pathophysiological role for AT1R autoantibodies in POTS.

METHODS AND RESULTS:

Serum immunoglobulin G from 17 patients with POTS, 6 patients with recurrent vasovagal syncope, and 10 normal controls was analyzed for the ability to activate AT1R and alter AT1R ligand responsiveness in transfected cells in vitro. Of 17 subjects with POTS, 12 demonstrated significant AT1R antibody activity in immunoglobulin G purified from their serum. No significant AT1R antibodyactivity was found in the subjects with vasovagal syncope or healthy subjects. AT1R activation by POTS immunoglobulin G was specifically blocked by the AT1R blocker losartan. Moreover, POTS immunoglobulin G significantly shifted the angiotensin II dosage response curve to the right, consistent with an inhibitory effect. All subjects with POTS were positive for one or both autoantibodies to the AT1R and α1-adrenergic receptor.

CONCLUSIONS:

Most patients with POTS harbor AT1R antibody activity. This supports the concept that AT1R autoantibodies and antiadrenergic autoantibodies, acting separately or together, may exert a significant impact on the cardiovascular pathophysiological characteristics in POTS.