Role of Transferrin Receptor 1 in Salt Sensitive Hypertension

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Summary

**Background:** Cellular iron transport protein, transferrin receptor 1 (TfR1) is required for the uptake of transferrin-bound iron into the cells. Previous reports have shown that iron accumulation is associated with the pathophysiology of cardiovascular disease; however, the role of TfR1 in the pathophysiology of hypertension remains unknown.

**Methods and Results:** First, to investigate the functional importance of TfR1 in the pathophysiology of hypertension, we subjected to 5/6 nephrectomy in TfR1 hetero knockout mice. Of interest, urinary albumin excretion, serum BUN levels, and serum creatinine levels were increased to a lesser extent in TfR1 hetero knockout mice compared with wild-type (WT) mice. Second, we assessed the functional role of TfR1 in human artery smooth muscle cells in vitro. The depletion of TfR1 by RNA interference attenuated human artery smooth muscle cells proliferation induced by platelet-derived growth factor-BB. Finally, we assessed aortic TfR1 expression in human abdominal aortic aneurysm (AAA) walls. Both Western blot and immunohistochemical analyses revealed that TfR1 expression is increased in human AAA walls compared with non-AAA walls.

**Conclusions:** These results indicate that TfR1 plays a role in the pathophysiology of hypertensive organ damage. Understanding the role of TfR1 in the pathophysiology of hypertensive organ damage may lead to a novel therapeutic approach for hypertensive organ damage.