Randomized Trial of Atenolol Versus Losartan in Children and Young Adults With Marfan Syndrome

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Background: Aortic-root dissection is the leading cause of mortality in Marfan syndrome. Recent studies suggest that losartan may be more effective in slowing aortic-root enlargement than β-blockers, the current standard therapy in most centers.

Methods: The NHLBI-funded Pediatric Heart Network conducted a randomized trial comparing losartan with atenolol in children and young adults with Marfan syndrome. The primary outcome was the rate of aortic-root enlargement, expressed as the change in body-surface area-adjusted maximum aortic-root dimension z-score (hereafter “aortic-root z-score”) over 3 years. Secondary outcomes included rate of change in absolute aortic-root dimension; progression of aortic regurgitation; time to aortic dissection, aortic-root surgery, or death; somatic growth; and incidence of adverse events.
**Results:** Between 2007 and 2011, 21 clinical centers enrolled 608 subjects, aged 6 months to 25 years (mean 11.2±6.3 years), who met original Ghent diagnostic criteria and who had an aortic-root z-score greater than 3.0 and an absolute aortic diameter of 5 cm or less. Of these, 60% were male, 25% were older teenagers and young adults, and the mean aortic-root z-score was 4.3±1.3. There were no important differences in baseline clinical or echocardiographic characteristics. The withdrawal rate was 11% (median follow-up 2.0 years). The baseline-adjusted rate of change for the aortic-root z-score (mean±standard error) did not differ significantly by treatment group (-0.139±0.013 standard deviation [SD] units/year with atenolol versus -0.107±0.013 SD units/year with losartan; P=0.08). Both slopes were significantly less than zero, indicating a decrease in aortic-root dimension relative to body-surface area with either treatment. The three-year rates of aortic-root surgery, aortic dissection, death, and their composite did not differ by treatment group.

**Conclusion:** In children and young adults with Marfan syndrome randomly assigned to either losartan or atenolol, we found no significant difference in the rate of aortic-root dilation between the two treatment groups over three years. (ClinicalTrials.gov number, NCT00429364)

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