PATHOGENIC AORTOPATHY GENES ARE ASSOCIATED WITH FASTER THORACIC ANEURYSM GROWTH: A LONG TERM EXPERIENCE FROM THE AURORA ST. LUKE'S AORTOPATHY CLINIC

Viviana Zlochiver, PhD[1], Xiaoxiao Qian, MD[2], Ana Perez Moreno, MD/PhD[1], Michelle Bush, NP[3], Heather Sanders, NP[3], M. Fuad Jan, MD[3] and A. Jami Tajik, MD[3]

[1]Advocate Aurora Research Institute –CV Research, Milwaukee, WI; [2]Internal Medicine, Advocate Aurora Health, Milwaukee, WI; [3]Cardiovascular Services, St. Luke's Medical Center, Advocate Aurora Health, Milwaukee, WI

BACKGROUND

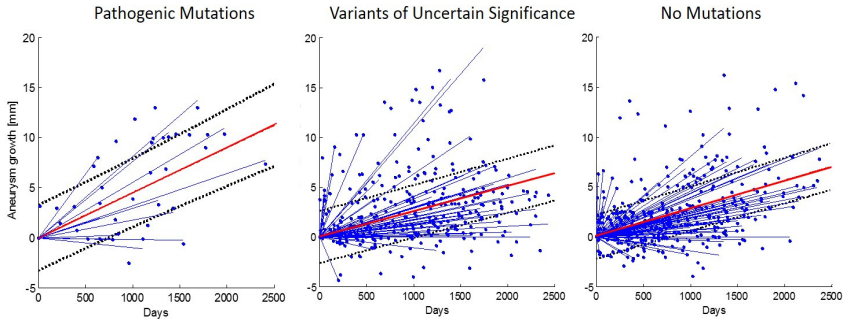
- Faster thoracic aortic aneurysm (TAA) growth is an important risk factor for Acute Aortic Syndrome.
- With as many as 22% of cases resulting in death before receiving medical attention, there is a need to better understand the factors driving TAA progression.
- Here, we seek to unveil the genetic background underlying the rate of TAA growth to help establish criteria for management optimization.

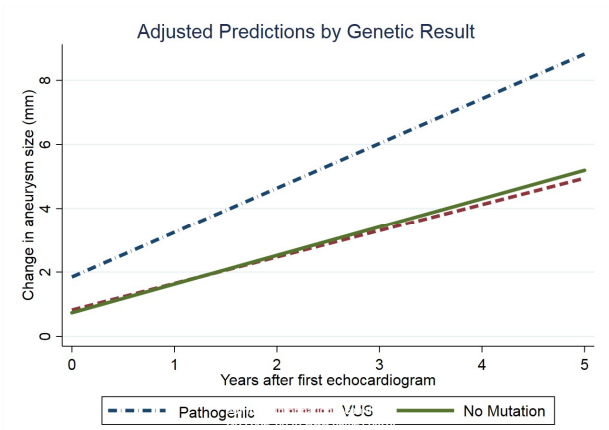
METHODS

A total of 162 unoperated TAA patients with serial aneurysm diameter measurements were screened for mutations in aortopathy gene panels from 2011 to 2019. Patients were categorized into 3 groups according to genetic profile: Pathogenic Mutation, Variant of Uncertain Significance (VUS) and No Mutation. Results were obtained through mixed effects modeling with random effects using STATA software.

RESULTS

Of the 162 patients, 6.8% were positive for pathogenic gene mutations and 34% for VUS. Aneurysms associated with pathogenic mutations were found to grow at a statistically significant higher rate (1.36 mm/year, 95% CI: 0.77-1.95) than aneurysms associated with VUS and no mutations (0.83 mm/year 95% CI: 0.66-0.99 and 0.89 mm/year 95% CI: 0.79-0.99, respectively p<0.001). Importantly, aneurysms were 20% more likely to eventually require surgical intervention for every mm increase in diameter.





While aneurysms associated with gene variants of uncertain significance (VUS) exhibit average growth rates comparable to those in patients with no mutations, close follow-up and genetic counseling are recommended to help determine pathogenicity on a case-by-case basis.

Table 1

	Pathogenic (n=11)	VUS (n=54)	No Mutation (n=96)
Family Hx of TAAD	64%	30%	36%
Gender	F: 18%	F:30%	F:22%
Mean Age (y±SD)	51±18	55±15	56±12
Mean BSA (m^2)	2.2±0.3	2.1±0.3	2.1±0.3
Mean Systolic BP (mmHg)	125±12	125±18	128±18
Mean HR (bpm)	62±9	64±15	64±12
Mean LVEF (%)	61±5	58±10	59±10
Mean Max Aortic Root Aneurysm Diameter (mm±SD)	47±3 (n=9)	44±4 (n=37)	44±4 (n=68)
Mean Max Ascending Aorta Aneurysm (mm±SD)	46±5 (n=8)	45±3 (n=34)	45±4 (n=71)
Mean Max Ascending Aorta Aneurysm (mm/BSA in m^2)	23±4 (n=6)	21±3 (n=38)	22±3 (n=68)
Eventual surgical repair	73%	13%	13%

CONCLUSIONS

Aneurysms associated with gene variants of uncertain significance exhibit average growth rates comparable to those in gene negative patients.

Aneurysms associated with pathogenic gene mutations grow significantly faster than those in VUS and mutations negative patients making them more likely to require closer follow-up and earlier surgical intervention.

No Disclosures

For more information, please visit:
viviana.zlochiver@aah.org

Aurora St. Luke's Medical Center

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