



# Sex-Differences in the Patterns of Cardiovascular Referral in Patients with Marfan, Ehlers-Danlos, and Loeys-Dietz Syndromes

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# Disclosures

- Nothing to disclose





## Background:



- Diagnosis of Marfan (MFS), Vascular Ehlers-Danlos (vEDS), and Loeys-Dietz (LDS) syndromes warrants specialized evaluation for screening and surveillance of aortic disease
- The magnitude of missed evaluation between male and female patients with MFS, vEDS, and LDS is unknown
- Understanding the magnitude of referral is critical to optimize the treatment of patients who may qualify for aortic intervention or operation



Aims:



Characterize the incidence of referral to cardiovascular medicine and cardiothoracic surgery among patients found to have MFS, vEDS, or LDS by sex



## Methods:



- Data: Electronic medical record database from Yale New Haven Health system
- Inclusion: Clinical or genetic diagnoses of MFS, vEDS, or LDS between 2013-2022
- Exposure: Male vs. female among patients with MFS, vEDS, or LDS
- Endpoint: Referral to cardiovascular medicine and cardiothoracic surgery



# Results:

## Overall Patient Characteristics

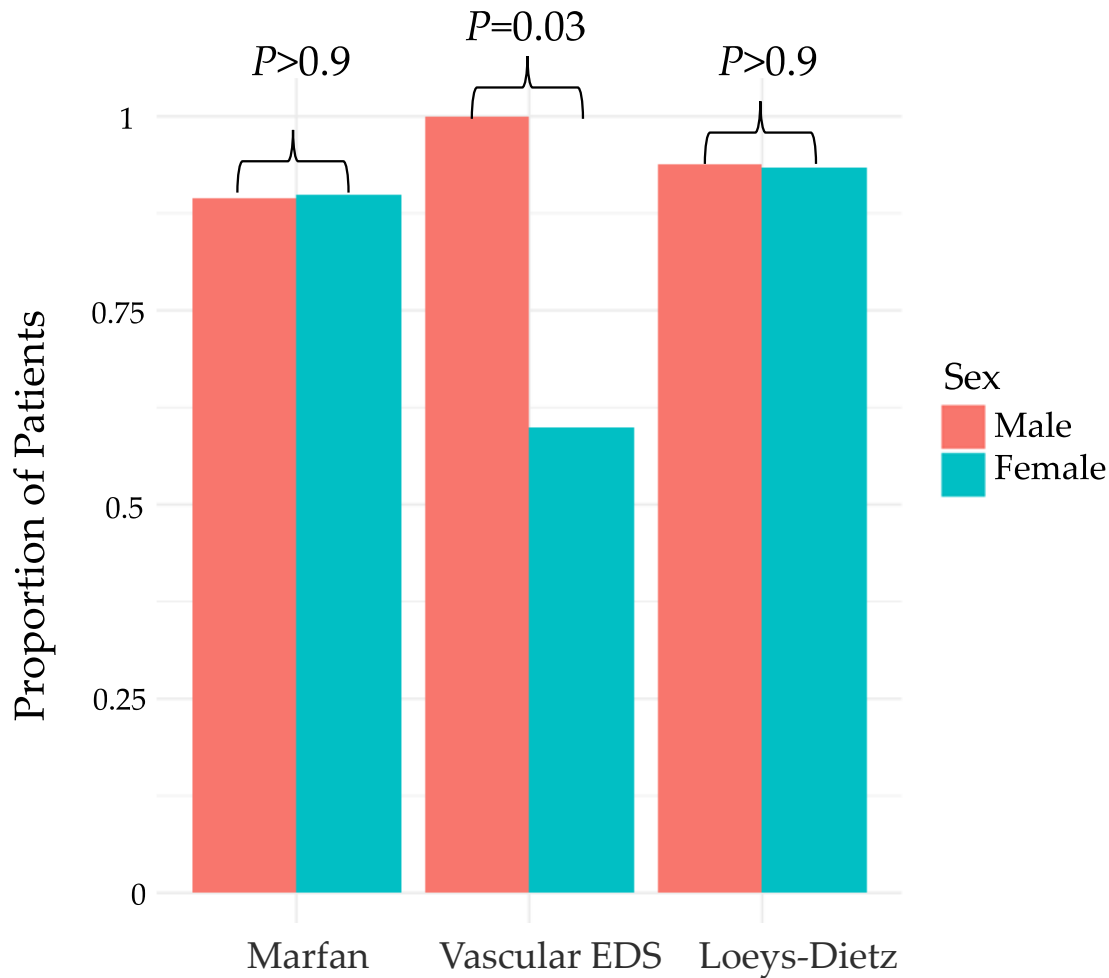


<b>Characteristic</b>	<b>Marfan (N=242)</b>	<b>Vascular Ehlers-Danlos (N=35)</b>	<b>Loeys-Dietz (N=31)</b>
Age	32 (21, 50)	44 (33, 55)	47 (28, 57)
Female	99 (41%)	25 (71%%)	15 (48%)
Hypertension	66 (27%)	8 (23%)	10 (32%)
Dyslipidemia	44 (18%)	5 (14%)	7 (23%)
Diabetes Mellitus	9 (3.7%)	3 (8.6%)	0 (0%)
Cardiovascular Medicine Evaluation	217 (90%)	25 (71%)	29 (94%)
Cardiothoracic Surgery Evaluation	92 (38%)	4 (11%)	19 (61%)
Aortic Pathology	113 (47%)	2 (5.7%)	15 (48%)

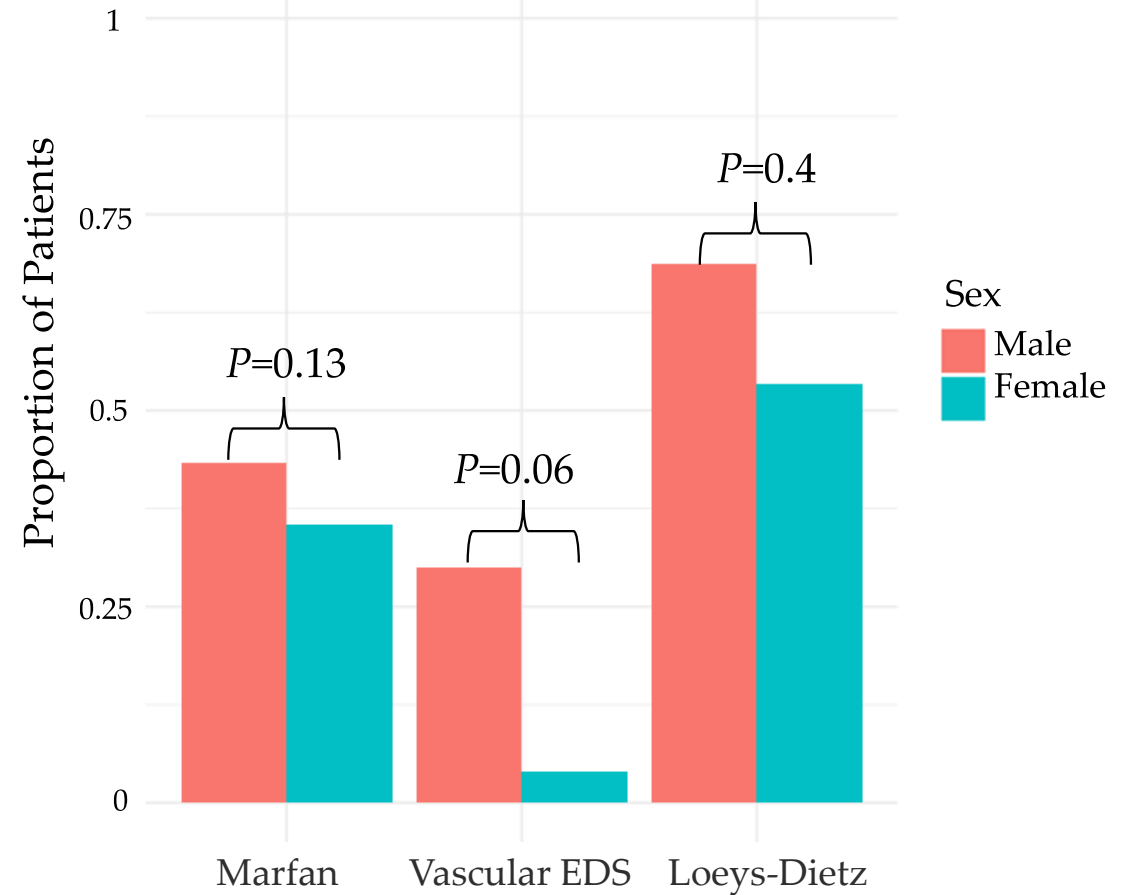


# Results: Overall Referral by Sex

### Proportion of Patients Referred to Cardiovascular Medicine



### Proportion of Patients Referred to Cardiothoracic Surgery



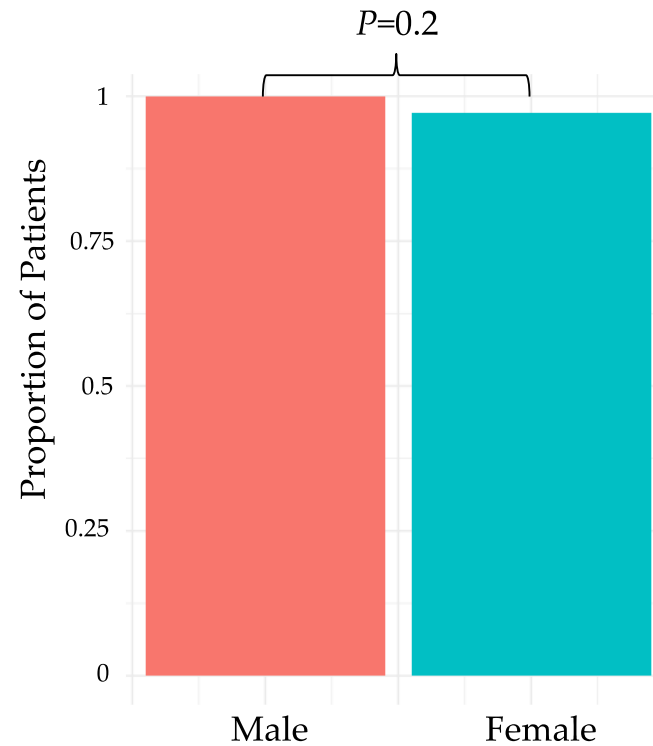


# Results: Referral Among Patients with Aortic Pathology

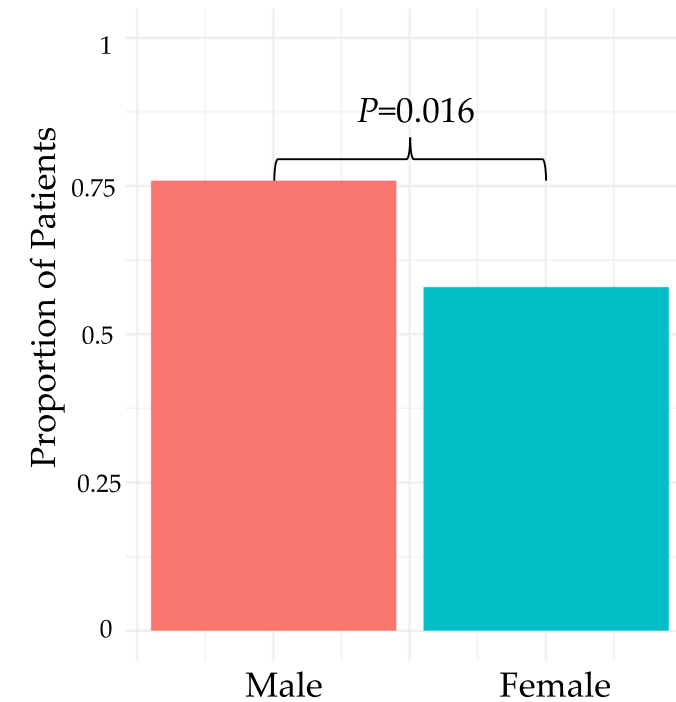


<i>Characteristics</i>	<i>Overall (N=128)</i>	<i>Male (N=72)</i>	<i>Female (N=59)</i>	<i>P- Value</i>
<i>Maximum Aortic Diameter</i>	4.40 (4.10- 4.90)	4.70 (4.28- 5.00)	4.20 (4.02- 4.40)	<b>&lt;0.001</b>
<i>Maximum ASI Diameter</i>	2.22 (2.00- 2.51)	2.15 (1.97- 2.39)	2.40 (2.07- 2.56)	<b>0.037</b>
<i>Maximum AHI Diameter</i>	2.45 (2.29- 2.66)	2.45 (2.29- 2.66)	2.45 (2.29- 2.67)	0.6
<i>Maximum Cross-Sectional Area to Height Ratio</i>	8.46 (7.50- 10.06)	8.96 (7.72- 10.44)	8.11 (7.38- 9.11)	0.1

Proportion of Patients Referred to  
Cardiovascular Medicine



Proportion of Patients Referred to  
Cardiothoracic Surgery



AHI: Aortic diameter indexed to height; ASI: Aortic diameter indexed to body surface area





## Conclusions



- Patients with MFS and LDS had high referral rates to cardiovascular medicine.
- Among patients with vascular EDS or aortic pathology, female patients with connective tissue diseases were less likely to be referred to cardiothoracic surgery compared to male patients.



# Thank you

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