Factors Associated with Delay in Diagnosis of Patients with Fibromuscular Dysplasia: A Report from the United States Registry for Fibromuscular Dysplasia

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MCORRP MICHIGAN CARDIOVASCULAR OUTCOMES RESEARCH AND REPORTING PROGRAM

FMD The Registry of Fibromuscular Dysplasia

FMDSA Fibromuscular Dysplasia Society of America

ABSTRACT

Background: Fibromuscular dysplasia (FMD) is an uncommon vascular disease of medium-sized arteries that may result in stenosis, dissection or aneurysm. It is unclear what factors affect time between first sign/symptom of FMD and diagnosis. Here we aim to identify the demographics, family history and presenting signs/symptoms associated with a large delay in diagnosis in order to facilitate more timely diagnoses in the future.

Methods: Patients in the FMD Registry from 10 U.S. sites were stratified into three cohorts based upon the length of time between first sign/symptom and diagnosis: 1) less than three years, 2) three to five years, or 3) greater than five years.

Results: Of the 615 patients in the FMD Registry, 538 had sufficient data for analysis. The mean length of time from first reported clinical sign/symptom to diagnosis was 3.6 ± 7.4 years. Patients with greater delays in diagnoses were younger at first sign/symptom and older by time of diagnosis, were more likely to present with hypertension, and had earlier onset and greater family history of hypertension. They also took more blood pressure medications and were more likely to take an angiotensin receptor blocker (ARB), diuretic or alpha blocker than patients with less time to diagnosis. Conversely, FMD patients with a shorter time to diagnosis were more likely to present with a carotid or renal artery dissection. Family history of stroke, aneurysm or sudden death, nor the common signs of headache, pulsatile tinnitus, aneurysm or hemispheric transient ischemic attack (TIA) at presentation were not correlated with delay in diagnosis.

Conclusions: The time from first sign/symptom to diagnosis in FMD patients is prolonged and associated with having hypertension. While patients with acute arterial dissection are more likely to have a timely diagnosis of FMD than other sub-populations, it takes more time to diagnose FMD in patients who present with early onset hypertension. Further work to increase physician awareness of FMD, especially among physicians who primarily care for hypertensive patients, may help to more effectively diagnose this disease and expedite the appropriate treatment.

Disclosures: The FMD Registry is funded by the Fibromuscular Dysplasia Society of America (FMDSA). Jeffrey Olin and Heather Gornik are non-compensated medical advisory board members to the FMDSA. Pamela Mace is a paid employee of the FMDSA.

BACKGROUND

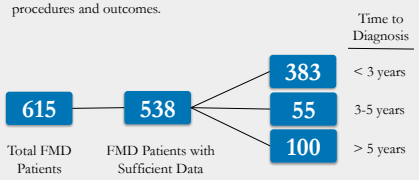
- Fibromuscular dysplasia (FMD) is an uncommon vascular disease disproportionally affecting women.
- The majority of information regarding FMD has arisen from single case reports or small case series.
- It has been previously noted that many FMD patients experience a large delay in diagnosis from symptom onset.
- However, this is the first study to use a FMD cohort to compare patients based upon time from first sign/symptom to diagnosis in order to better understand and ultimately reduce this delay.

OBJECTIVE

- To identify demographics, family history and presenting signs/symptoms associated with a large delay in diagnosis in fibromuscular dysplasia patients in order to facilitate more timely diagnoses in the future.

METHODS

- The FMD Registry – formed in 2008 – consisted of 10 U.S. clinical sites and had 615 patients enrolled at time of data abstraction (9/2012).
- Michigan Cardiovascular Outcomes Research and Reporting Program (MCORRP) acts as the coordinating center.
- A standardized data collection form includes patient and family history, presenting signs and symptoms, diagnostic tests, medications, procedures and outcomes.



RESULTS

Table 1. Time from first sign/symptom to diagnosis

	Min-Max	Mean±SD
Time from symptom onset to diagnosis	0-54 years	3.6±7.4 years

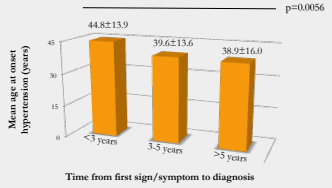
Table 2. Patient demographics

	Time from symptom onset to diagnosis			p-value
	<3 years	3-5 years	> 5 years	
N	383/538 (71.2%)	55/538 (10.2%)	100/538 (18.6%)	
Age at first sign/symptom in years (Mean±SD)	50.4±13.3	45.7±12.4	39.1±15.8	<0.0001
Age at diagnosis in years (Mean±SD)	50.6±13.3	49.5±12.4	55.3±13.6	0.0041
Male gender	30/383 (7.8%)	3/55 (5.5%)	9/100 (9.0%)	0.76

Table 3. Family history

	Time from symptom onset to diagnosis			p-value
	<3 years	3-5 years	> 5 years	
Hypertension	241/333 (72.4%)	41/53 (77.4%)	82/94 (87.2%)	0.0087
Stroke	145/312 (46.5%)	20/45 (44.4%)	46/85 (54.1%)	0.42
Aneurysm	68/311 (21.9%)	12/45 (26.7%)	20/85 (23.5%)	0.72
Sudden death	44/296 (14.9%)	6/46 (13.0%)	16/83 (19.3%)	0.56
FMD	17/333 (5.1%)	5/50 (10.0%)	11/96 (11.5%)	0.054

Figure 1. Age at onset of hypertension (Mean±SD)



RESULTS

Figure 2. Number of blood pressure medications (Mean±SD)

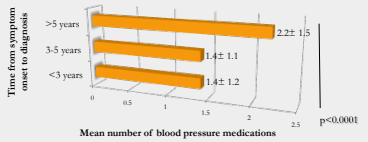


Table 4. Presenting signs/symptoms

	Time from symptom onset to diagnosis			p-value
	<3 years	3-5 years	> 5 years	
Headache	195/339 (57.5%)	31/53 (58.5%)	54/94 (57.4%)	1.0
Hypertension	229/360 (63.6%)	34/54 (63.0%)	75/96 (78.1%)	0.021
Pulsatile tinnitus	106/321 (33.0%)	20/50 (40.0%)	31/88 (35.2%)	0.60
Hemispheric TIA	35/330 (10.6%)	4/51 (7.8%)	7/93 (7.5%)	0.67
Stroke	30/336 (8.9%)	0/52 (0.0%)	10/94 (10.6%)	0.028
Carotid artery dissection	64/326 (19.6%)	2/50 (4.0%)	7/91 (7.7%)	0.00077
Renal artery dissection	17/327 (5.2%)	1/52 (1.9%)	0/92 (0.0%)	0.035

CONCLUSIONS

- The average time between first sign/symptom and diagnosis for patients in the FMD Registry was 3.6 years.
- FMD patients with shorter time to diagnosis were older at symptom onset and younger at the time of diagnosis.
- A larger time to diagnosis was correlated with a greater family history and incidence of hypertension, an earlier onset of hypertension, and a greater number of blood pressure medications at presentation.
- Increasing awareness of FMD among physicians who care for hypertensive patients may help to expedite diagnosis and treatment of FMD patients in the future.