Increased Epicardial Spasm in ANOCA Patients with Diagnosed Migraines

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Background

- Patients with Angina and Non-Obstructive Coronary Artery Disease (ANOCA) present with severe angina symptoms despite non-obstructive coronary artery findings
- Coronary microvascular and/or vasomotor dysfunction (CMVD) is the primary pathophysiological mechanism underlying ANOCA
- Migraines, a neurological disorder characterized by recurrent headaches, share pathophysiological links with endothelial dysfunction that can contribute to CMVD
- The impact of migraines in ANOCA patients has been largely unexplored

Objective

Compare angina presentation, CMVD prevalence, and clinical characteristics between ANOCA patients with a history of migraines and those without

Methods

- Prospective registry-based cohort of ANOCA patients (angina with <50% stenosis in the major epicardial vessels) who underwent coronary functional angiography (CFA)
- Migraine history based on documented medical diagnosis or prescribed migraine medications, and angina results were compared as described in Table 1
- CMVD diagnoses (endothelial dependent, independent, and epicardial spasm) based on CFA were defined as the following:
  - Endothelial-independent CMD (coronary flow reserve [CFR] < 2.5 in response to adenosine)
  - Endothelial-dependent CMD (coronary blood flow [CBF] < 50% or no change in vessel diameter in response to 54mcg intracoronary acetylcholine)
  - Epicardial spasm (>90% constriction) to 108 mcg intracoronary acetylcholine

Results

Table 1. Results	ANOCA Without Migraines (N= 308)	ANOCA + Migraines (N= 86)	P-value
Demographics			
Age, years, median (IQR)	59 (50, 67)	53 (44, 64)	**0.003**
Female, N (%)	257 (86)	79 (94)	**0.040**
Race/Ethnicity, N (%)			
White	259 (84)	73 (85)	0.907
Black	36 (12)	10 (12)	0.980
Hispanic	5 (2)	3 (4)	0.380
BMI, kg/m^2, median (IQR)	29.5 (25.1, 35.5)	31.4 (24.3, 35.6)	0.119
Clinical Characteristics			
Hypertension, N (%)	213 (69)	58 (67)	0.762
Hyperlipidemia, N (%)	291 (94)	83 (97)	0.585
Diabetes, N (%)	65 (21)	16 (91)	0.612
HFpEF, N (%)	55 (18)	20 (23)	0.260
Migraine Medications, N (%)	N/A	69 (80)	N/A
Validated Questionnaire Scores			
Vasospastic Angina (N,%)	245 (80)	77 (90)	**0.034**
Microvascular Angina (N,%)	260 (84)	75 (87)	0.521
DASI[1] (0-58.2), mean ± SD	33.5 ± 13.3	31.0 ± 13.9	0.171
SAQ7[1] (0-100), median, IQR	35 (19.4, 50)	24.3 (9.7, 38.3)	**<0.001**
UCSD SOB[2] (0-120), median, IQR	36 (18,55)	42 (31,66)	**0.003**
PSS[2] (0-40), median, IQR	13 (10, 18)	13 (10, 17)	0.586
CMD Diagnosis			
CFR, median (IQR)	2.1 (1.8, 2.7)	2.4 (1.9, 2.8)	0.125
Endothelial Independent CMD, N (%)	183 (67)	40 (49)	**0.002**
Endothelial Dependent CMD, N(%)	143 (53)	40 (50)	0.685
Epicardial Spasm, N (%)	89 (29)	36 (42)	**0.022**
Any CRT Abnormality, N (%)	261 (85)	72 (84)	0.187

1=Lower score indicates adverse condition; 2=Higher score indicates adverse condition
CCS Class indicates Canadian Cardiovascular Society angina class; SAQ7, Seattle Angina Questionnaire; PSS, Perceived Stress Scale; DASI, Duke Activity Status Index; USCD SOB, University of California, San Diego Shortness of Breath Questionnaire. Proportion data was compared via chi-square, displayed as N, %. Means were compared via t-test and displayed as the group mean, standard deviation (SD). Non-normally distributed data was compared via Wilcoxon-rank sum test, represented as median (interquartile range, IQR).

Results (Continued)

- Among the 394 ANOCA patients, 86 had a documented history of migraines or were active on migraine medications
- ANOCA patients with migraines were significantly younger than the ANOCA patients without migraines (p=0.003)
- The migraine group was 94% female compared to 86% in the ANOCA patients without migraines (p=0.040)
- Patients with migraines had a higher prevalence of vasospastic angina (p=0.034), more severe angina as measured via SAQ-7 (p<0.001), and worse shortness of breath as measured via UCSD-SOB (p=0.003)
- On CFA, patients with migraines had a lower proportion of endothelial independent CMD (p=0.002) and significantly more epicardial spasm (p=0.022)
- There were no differences on continuous measures of endothelial independent CMD (CFR), nor endothelial dependent CMD

Conclusions

- ANOCA patients with diagnosed migraines have a higher prevalence of vasospastic angina, as well as more severe angina and shortness of breath than those without
- There is a higher prevalence of epicardial spasm in patients with diagnosed migraines
- These findings are consistent with theories linking migraines and ischemia
- Future studies are needed to establish underlying pathophysiological mechanisms responsible for connection between migraines and increased epicardial spasm
- Future analysis should examine the association between migraine medications such as triptans and coronary vasospasm

Supported by The Lindner Center For Research Summer Internship Program
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