Sex Differences Among Emergency Department Patients Who Receive a Pulmonary Embolism Response Team Activation

Angela F Jarman,[1] Sam Rouleau,[2] Brandon C Maughan,[3] Hannah Kelson,[4] Christian Sebat,[2] Brandon Eller,[1] David Vinson,[5] Bryn E Mumma[1]

[1]Dept of Emergency Medicine, University of California, Davis, [2]Dept of Internal Medicine, Pulmonology and Critical Care, University of California, Davis,

[3] Dept of Emergency Medicine, Oregon Health and Science University, [4] School of Medicine, University of California, Davis, [5] Kaiser Permanente Northern California Division of Research, Pleasanton, CA

BACKGROUND

Multidisciplinary Pulmonary Embolism Response Teams (PERT) have increased in popularity as the treatments available for acute PE have evolved in number and complexity. There is little known about potential sex differences in clinical characteristics of patients for whom the PERT team is activated, a subset of acute PE patients that have high risk features or other clinical complexities.

METHODS

- Retrospective cohort study conducted at a single tertiary care hospital
- All adult patients for whom the PERT was activated between 8/1/2017 and 10/31/2024
- PERT activation is recommended for moderate- and high-risk patients only at this institution
- Clinical and demographic data were obtained from the electronic medical record
- Descriptive and inferential analyses using Chi-square tests and t tests were performed
- Deemed exempt by the local IRB

TABLES

Table 1: Baseline Patient Characteristics

PERT Activations	Female n (%) n=227	Male n (%) n=274	Total n (%) n=501	p-value
Age*	62.5 (16.9)	62.4 (14.6)	62.4 (15.7)	0.94
BMI*	31.4 (10.1)	30.3 (7.6)	30.8 (8.8)	0.15
Race/Ethnicity				
Black	31 (13.7)	58 (21.2)	89 (17.8)	0.07
Asian	10 (4.4)	5 (1.8)	15 (3.0)	
White	102 (44.9)	141 (51.5)	243 (48.5)	
Multiracial	26 (11.5)	26 (9.5)	52 (10.4)	
Other	15 (6.6)	8 (2.9)	23 (4.6)	
Hispanic	32 (14.1)	27 (9.9)	59 (11.8)	
Unknown	7 (3.1)	6 (2.2)	13 (2.6)	
Hawaiian/PI	3 (1.3)	2 (0.7)	5 (1.0)	
American Indian	1 (.4)	1 (.4)	2 (0.4)	
Insurance				
Commercial	49 (21.7)	72 (26.5)	121 (24.3)	0.09
Medicare	123 (54.4)	119 (43.8)	242 (48.6)	
Medi-Cal	52 (23.0)	80 (29.4)	132 (26.5)	
Other	2 (0.9)	1 (0.4)	3 (0.6)	
Code Status	n=486			
Full	186 (84.2)	238 (89.8)	424 (87.2)	0.18
Limited	6 (2.7)	5 (1.9)	11 (2.3)	
DNR/DNI	29 (13.1)	2 (8.3)	51 (10.5)	

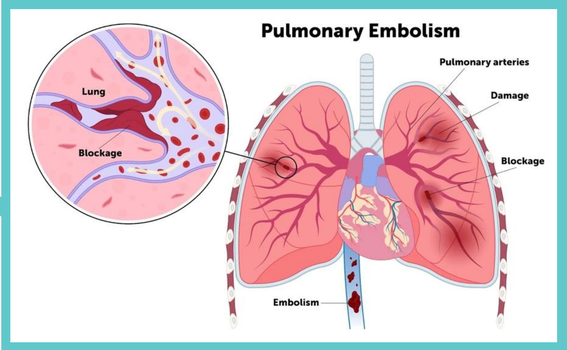
*Output shown is mean (SD)

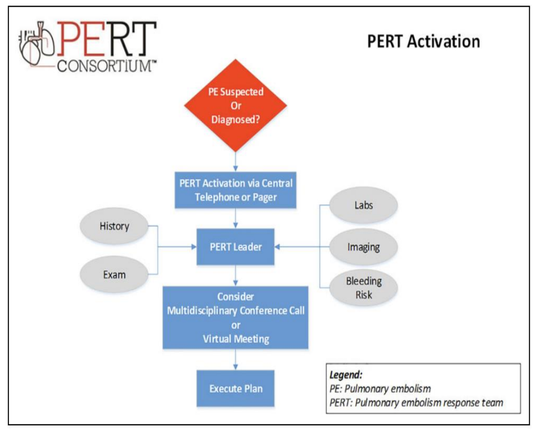
Table 3: Sex Differences in Clinical Characteristics

	Female mean (SD) n=227	Male Mean (SD) n=274	Total mean (SD) n=501	p-value
Highest Heart Rate	110 (23)	108 (24)	109 (23)	0.36
Lowest Systolic Blood Pressure	102 (20)	104 (19)	103 (20)	0.24
Lowest Oxygen Saturation	91 (6)	91 (7)	91 (7)	0.98
Highest Respiratory Rate	27 (10)	26 (7)	26 (8)	0.25
Highest Troponin T (n=440)	275 (2763)	107 (648)	183 (1919)	0.36
Highest BNP (n=252)	302 (425)	306 (589)	304 (516)	0.95
Blood Transfusion	13 (5.7)	14 (5.1)	27 (5.4)	0.76
Mortality 7 days	16 (7.1)	12 (4.4)	28 (5.6)	0.20
Mortality 30 days	29 (12.8)	21 (7.7)	50 (10.0)	0.06

Table 2: Sex Differences in Comorbidities

	Female n (%) n=227	Male n (%) n=274	Total n (%) n=501	p-value
Chronic Lung Disease	73 (32.2)	58 (21.2)	131 (26.2)	0.01
Heart Failure	42 (18.5)	63 (23.0)	105 (21.0)	0.22
Coronary Artery Disease	38 (16.7)	55 (20.1)	93 (18.6)	0.34
Gastrointestinal Bleeding	18 (7.9)	24 (8.8)	42 (8.4)	0.74
Hypertension	126 (55.5)	155 (56.6)	281 (56.1)	0.81
Chronic Kidney Disease	48 (21.2)	74 (27.0)	122 (24.4)	0.13
Stroke	30 (13.22)	35 (12.8)	65 (13.0)	0.88





RESULTS

- 501 unique patients encounters
- Majority male (55%; 274/501)
- Demographic characteristics were similar by sex, including age, race, payor, and code status
- Female and male patients had similar prevalence of comorbid conditions including congestive heart failure, coronary artery disease, and hypertension.
- Females were more likely to have comorbid chronic lung disease (p=0.005).
- No significant differences in vital signs, including oxygen saturation, respiratory and heart rates, and systolic blood pressure by sex
- Although not significant, there was a trend toward higher mortality in female patients at 30 days (12.8% versus 7.7%, p=0.057)

CONCLUSION

Emergency department patients for whom the PERT was activated had similar demographic and clinical characteristics. Prior data suggests that women are more likely to present with high-risk features. Thus, the male predominance in this cohort is deserving of further research to evaluate the relationship between patient sex and clinical presentation, treatment, & outcomes, particularly when a PERT is involved.

This work is supported in part by the Building Interdisciplinary Research Careers in Women's Health at UC Davis, grant 5K12HD051958-17.