

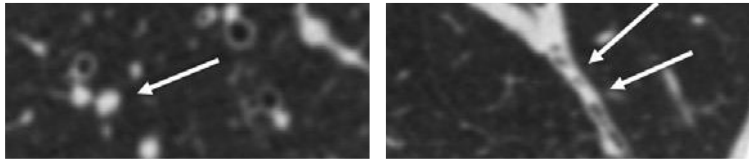
Sex differences in bronchial mucus plugging among COPD patients

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Background:

Muco-obstructive lung disease: mucus ↑ production ↓ clearance Δ quality
 Can occlude the lumen of bronchi, causing a bronchial mucus plug (BMP)
 BMP are noticeable in CT scans:



BMP occurs frequently in COPD (25%) and is associated with severity
 ↓ FEV1 ↓ O2 ↓ 6-minute walk distance ↓ Quality of life (QOL)
 ↑ symptoms ↑ annual exacerbations

Women naturally produce cervical MP (CMP) during pregnancy
 Progesterone induces thickening of the mucus, CMP protects carriage
Knowledge gap: Among COPD patients it is unknown if women have more BMP than men, and if BMP affects them differently.

Methods:

Cross-sectional analysis
 COPD Gene study, years 2007-2011
 Selected patients with COPD
 Visually assessed BMP on visit 1 CT scan

Results:

Table 1: Demographics

Variable	All n=2089	Men n=1154	Women n=935
White, n (%)	1600 (77)	892 (77)	708 (76)
Black, n (%)	489 (23)	262 (23)	227 (24)
Age, median (range)	63 (39-85)	63 (43-81)	63 (39-85)

Table 2: BMP across sexes

Variable	All n=2089	Men n=1154	Women n=935
MP, n (%)	658 (32)	336 (29)	322 (36)
OR, univariate, p	1 (.009)	0.78 (.009)	1.28 (.009)
OR, multivariate*, p	1 (<.001)	0.70 (<.001)	1.42 (<.001)

Table 3a: Effect of BMP over health outcomes, multivariate** analysis

Variable	FEV1, L (p value)	Quality of life, SGRQ score (p value)	Dyspnea mMRC score / presence	Oxygenation Resting SpO2
All	-0.100 (<.001)	8.4 points (<.001)	0.45 (<.001) / OR 1.71	-0.57 (.012)

Table 3b: Effect of BMP over health outcomes, sex-stratified analysis

	FEV1, L (p value)	Quality of life, SGRQ score (p value)	Dyspnea mMRC score / presence	Oxygenation Resting SpO2
Men	-0.118 (<.001)	8.0 points (<.001)	0.46 (<.001) / OR 1.77	-0.58 (.005)
Women	-0.080 (<.001)	8.9 points (<.001)	0.23 (<.001) / OR 1.67	-0.54 (.048)

Women with COPD have more bronchial mucus plugging (BMP) than men with COPD.

In patients with COPD, the BMP-associated worsened airway obstruction and dyspnea are greater among men, and the BMP-associated worsened quality of life and oxygen saturation are similar across sexes.

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Discussion:

Endocrine

- Androgen & androgen receptor expression
- Progesterone and menopause
- Glucocorticoid & hormone therapies

Environmental

- MUC expression
- Social determinants of health
- Effect modification across races

Anatomical

- Bronchial width
- Longitudinal analysis

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*Multivariate model includes age, sex, race, pack years, bronchial wall thickness, emphysema, current smoking. / **Multivariate model includes age, sex, race, BMI, pack years, bronchial wall thickness, emphysema, current smoking, BMP