Sex Differences in Depression, Dyspnea, and Cognitive Functioning Among Patients with Chronic Lung Disease

Emily J. Hellwig
Advisor: Dr. Charles Emery
Department of Psychology

BACKGROUND

Lung Disease
- Dyspnea, the subjective awareness of shortness of breath, is the most common physical symptom
- Strong association between depression and dyspnea

Chronic Obstructive Pulmonary Disease (COPD)
- Results from smoking or exposure to lung irritants
- Third leading cause of death in the United States
- Prevalence of depression ranges from 42% to 71%
- Women report greater depression and dyspnea than men
- More women die from COPD than men

Idiopathic Pulmonary Fibrosis (IPF)
- Etiology unknown
- Responsible for 40,000 deaths annually
- 23% of patients endorse significant levels of depression

Lack of research on sex differences
- Research has focused on men due to smoking demographics
- Few studies examine sex differences in psychological distress and cognitive functioning
- No prior study has examined sex differences in samples including both COPD and IPF patients

METHODS

Utilized archival data collected in the pulmonary clinics at OSU

Participants:
Men (n = 21) and women (n = 10) with COPD or IPF

Measures:
- Psychological Measures
  - Depression: CESD
  - Dyspnea: UCSD
  - Quality of Life: SF-36 (PCS, MCS); SGRQ
  - Anxiety: Beck Anxiety Inventory
  - Sleep: Pittsburgh Sleep Quality Index

- Cognitive Measures
  - COWAT: verbal processing ability, frontal lobe functioning
  - Digit Symbol: psychomotor speed, sequencing ability
  - Trail Making Test: executive functioning
  - Stroop Interference Task: response inhibition, selective attention

- Pulmonary Measures
  - Forced expiratory volume in 1 second (FEV1)
  - Forced vital capacity (FVC)
  - FEV1/FVC
  - Six Minute Walk Test

- Data Analysis
  - Pearson correlations
  - Analysis of variance with sex as a between subjects factor

HYPOTHESES

1. Women will report more depression and dyspnea than men
2. Measures of depression and dyspnea will be more highly correlated in women than in men
3. There will be an inverse correlation between cognitive performance and levels of distress
4. When matched with men of equal pulmonary impairment, women will exhibit greater cognitive dysfunction

RESULTS

Figure 1. Total Sample (n = 31)

- Depression Scores by Sex
- Dyspnea by Sex
- Cognitive Performance by Sex

Figure 2. Subset matched on severity of pulmonary disease (n = 20)

- Cognitive Performance by Sex

SUMMARY

Hypothesis 1: (Figure 1)
- Women did not report more depression or dyspnea, but performed better on select cognitive tests

Hypothesis 2:
- Among women, measures of depression and dyspnea were not significantly correlated
- However, the magnitude of the correlation was moderate to large (r = .49) suggesting a likely relationship

Hypothesis 3:
- Lower quality of life (SGRQ) correlated with poorer cognitive functioning (Stroop Word Raw Score)
  - Full sample: r = .42, p = .022; Men: r = .48, p = .026
  - Among women:
    - Greater depression associated with poorer cognitive function (Stroop Color Raw Score) r = -.68, p = .042
    - Worse mental quality of life (MCS) associated with poorer cognitive function (Stroop Word t-scores) r = .70, p = .034

Hypothesis 4: (Figure 2)
- Using the matched subset, women performed significantly better on Digit Symbol

DISCUSSION

Predictions were only partially supported:
- No sex differences in depression or dyspnea
- However, higher quality of life was associated with better cognitive performance in both men and women

Women performed better on some cognitive measures:
- Women may exhibit better cognitive functioning than men
- Sample of women may have been exceptionally resilient
- In the subset, men indicated more distress on every measure
- Distress may help explain men's poorer cognitive functioning

Women reported fewer symptoms of distress than men:
- Combining COPD and IPF patients may have obscured effects which might otherwise have been observed
- IPF patients were significantly older, and exhibited greater pulmonary functioning and less distress than the COPD group
- No indication of origin of COPD for subjects

Small sample size limited statistical power – may account for lack of sex differences observed

Implications:
Sex differences may be important to consider when evaluating and treating symptoms of chronic lung disease

Future Directions:
Examine sex differences in cognitive functioning and symptom reporting in a larger sample of lung disease patients