ABSTRACT

**Purpose:** Three studies were performed in order to comprehensively examine the combined effects of healthy aging and biological sex on respiratory mechanics and the perception of dyspnea during exercise in healthy adults.

**Methods:** Study #1 (Chapter 2) investigated the mechanical ventilatory and sensory responses to incremental exercise in a group of younger men and women (20-30 years), and older men and women (60-80 years). Study #2 (Chapter 3) examined inspiratory muscle recruitment patterns during incremental exercise in a group of younger men and women (20-30 years), and older men and women (60-80 years). Study #3 (Chapter 4) assessed whether experimentally manipulating the magnitude of mechanical ventilatory constraint during moderate-intensity exercise would alter the perception of dyspnea in a group of older men and women.

**Conclusions:** Healthy aging and biological sex independently increase the magnitude of ventilatory constraint during exercise in healthy adults. Specifically, older individuals and women have a higher work of breathing for a given minute ventilation, and a higher propensity towards expiratory flow limitation during exercise than men and younger individuals, respectively. Additionally, older women have a higher perception of dyspnea during exercise than older men, which could be explained by the combined effects of age and sex on mechanical ventilatory constraint during exercise (Study #1). Healthy aging and biological sex also independently affect the pattern of inspiratory muscle recruitment during exercise, where older individuals and women rely on extra-diaphragmatic inspiratory muscles to a greater extent than older individuals and women, respectively (Study #2). Despite these differences in respiratory mechanics, acutely manipulating the magnitude of mechanical ventilatory constraint during moderate-intensity exercise did not have an effect on the perception of dyspnea (Study #3). Collectively, the results of this series of studies suggest that sex-differences in respiratory mechanics during exercise persist throughout the healthy aging process, but do not contribute to the increased sensations of dyspnea observed in healthy older women relative to healthy older men.

BIOGRAPHICAL NOTES

Place of Birth: Winnipeg, Canada

Academic Studies:
- B. Sc. (Hons) University of Ottawa, 2009

GRADUATE STUDIES

Field of Study: Exercise Physiology

Courses (500 level and above)  
- MEDI 560 Pulmonary Pathophysiology  
  Dr. N. T. Ayas
- KIN 530A Directed Studies  
  Dr. A. William Sheel
- KIN 500B Saltin International Graduate Course in Exercise & Clinical Physiology  
  Dr. R. Boushel  
  Dr. T. E. Graham  
  Dr. P. F. Gardiner
- INDS 501 Instructional Skills Workshop  
  K. Rothe

AWARDS

- Respiratory Rehabilitation Research Fellowship, British Columbia Lung Association (2017)
- Postgraduate Scholarship Doctoral (PGS-D), Natural Sciences and Engineering Research Council of Canada (2014-16)
- Four Year Fellowship, University of British Columbia (2012-16)
- Graduate Research Grant, Faculty of Education (2014)
- Graduate Award, Faculty of Education (2012)

SELECTED PUBLICATIONS


SELECTED PRESENTATIONS


SUPERVISORY COMMITTEE

Prof A. William Sheel
Prof Jordan A. Guenette
Prof Jeremy D. Road

YANNICK MOLGAT-SEON

B. Sc. (Hons) University of Ottawa, 2009

Friday, November 17, 2017, 9:00 am
Room 200, Graduate Student Centre
Latecomers will not be admitted

“Sex-differences in Respiratory Mechanics during Exercise in Healthy Aging”

EXAMINING COMMITTEE

Chair:
Prof Mariana Brussoni (Experimental Medicine)

Supervisory Committee:
Prof A. William Sheel, Research Supervisor (Kinesiology)
Prof Jordan A. Guenette (Rehabilitation Sciences)

University Examiners:
Prof Karin H. Humphries (Bioinformatics)
Prof Patricia M. Schulte (Zoology)

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