Challenges and new potential in COPD diagnosis and pulmonary function testing.

by

Stine Hangaard Caspersen

Chronic obstructive pulmonary disease (COPD) is a chronic lung disease characterized by airflow limitation. All patients with relevant respiratory symptoms who have been exposed to known risk factors for COPD should be considered for diagnostic evaluation. A diagnosis of COPD is based on spirometry. A post-bronchodilator forced expiratory volume in 1 second/forced vital capacity (FEV1/FVC) < 0.7 confirms the presence of COPD. It is essential that COPD is diagnosed correctly so that appropriate treatment can be initiated. However, COPD remains highly undiagnosed and misdiagnosed. Spirometry is the key pulmonary function test in COPD diagnosis and monitoring even though spirometry proves problematic. The problems related to spirometry underline the need for alternative approaches in COPD pulmonary function testing.

The aim of the thesis was twofold. First, the thesis aimed to explore the challenges of underdiagnosis and misdiagnosis of COPD. Second, the thesis aimed to explore alternatives to existing methods in COPD pulmonary function testing. The thesis was based on four studies represented in four individual papers. Paper I and Paper II concentrated on the first aim, whereas Paper III and Paper IV concentrated on Paper IV. Study I explored the characteristics of patients with undiagnosed COPD. Study II explored the causes of misdiagnosed COPD. Study III proposed to adjust the pre-bronchodilator threshold for spirometry-based diagnosis of COPD. Finally, Study IV validated the potential of a novel pulmonary function test; the SPOT test.

In conclusion, the diagnosis of COPD proves problematic. It is challenging to identify potential cases of COPD as patients with undiagnosed COPD are characterized by mild respiratory symptoms. Moreover, the causes of misdiagnosis are many, and they are mainly linked to the key pulmonary function test, spirometry. An adjustment of the pre-bronchodilator threshold from 0.7 to 0.66 may improve COPD diagnosis by limiting misclassification. However, such an adjustment is inadequate and there is a need for alternative pulmonary function tests in COPD. The SPOT test shows promise as a new pulmonary function test in COPD. However, further studies are needed to ensure the validity and the future role of the SPOT test in COPD diagnosis and monitoring.

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PhD lecture

By

Stine Hangaard Caspersen

Friday 12 October 2018

DEPARTMENT OF HEALTH SCIENCE AND TECHNOLOGY
AALBORG UNIVERSITY

This thesis is based on
Stine Hangaard Caspersen´s research work at:

Department of Health Science and Technology
Aalborg University, Denmark

To fulfill the requirements for the PhD degree, Stine Hangaard Caspersen has submitted the thesis: Challenges and new potential in COPD diagnosis and pulmonary function testing, to the Faculty Council of Medicine at Aalborg University.

The Faculty Council has appointed the following adjudication committee to evaluate the thesis and the associated lecture:

Professor Abdul Roudsari
University of Victoria
Canada

Professor Ronald Summers
Loughborough University
UK

Chairman:
Associate Professor Samuel Schmidt
Aalborg University
Denmark

Moderator:
Associate Professor Louise Pape-Haugaard
Aalborg University
Denmark

The PhD lecture is public and will take place on:

Friday 12 October 2018 at 13:00
Aalborg University – Room 7A/4-106
Fredrik Bajers Vej 7A
9220 Aalborg East

Program for PhD lecture on

Friday 12 October 2018

by

Stine Hangaard Caspersen

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Chairman:	Associate Professor Samuel Schmidt
Moderator:	Associate Professor Louise Pape-Haugaard

13.00	Opening by the Moderator
13.05	PhD lecture by Stine Hangaard Caspersen
13.50	Break
14.00	Questions and comments from the Committee Questions and comments from the audience at the Moderator's discretion
16.00	Conclusion of the session by the Moderator

After the session a reception will be arranged