



UNIVERSITI TEKNOLOGI MARA (UITM)

**RELATIONSHIP BETWEEN RESTING HEART
RATE, SYMPTOMS AND EXACERBATION IN
PATIENTS WITH CHRONIC OBSTRUCTIVE
PULMONARY DISEASE (COPD)**

AISYA NATASYA BINTI MUSA

Dissertation submitted in fulfilment of the requirements for the degree of

Master of Medicine

Faculty of Medicine

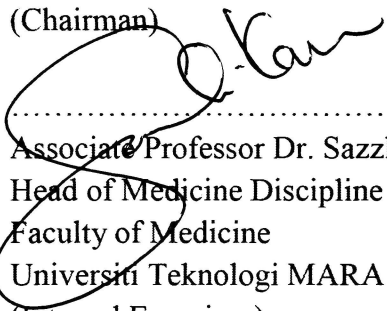
November 2015


CONFIRMATION BY PANEL OF EXAMINERS

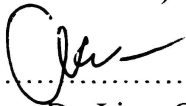
I certify that a Panel of Examiners has met on 16th November 2015 to conduct the final examination on Aisya Natasya Binti Musa on her Master of Medicine thesis entitled "Relationship Between Resting Heart Rate and Symptoms and Exacerbation in Patients with Chronic Obstructive Pulmonary Disease (COPD)" in accordance with Universiti Teknologi MARA Act 1976 (Akta 1976). The Panel of Examiners recommends that the student should be awarded the relevant degree. The panel of examiners was as follow:



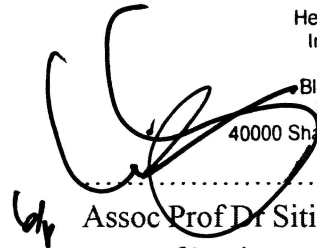
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree, qualification or academic award.

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ABSTRACT

Introduction:

Resting heart rate is a readily available data and has been shown to be associated with mortality in COPD patients. However, there is a lack of data on whether it has any association with exacerbation, symptoms and spirometric parameters in COPD patients. This study aims to identify the association between resting heart rate and exacerbation, symptoms and spirometric parameters.

Methodology:

This is a multi-centre cohort study with 12 months follow up of COPD patients recruited during acute exacerbation of COPD requiring hospitalisation from 1st April 2012 till 30th September 2015. Patient's sociodemographic data, anthropometric indices and medications history were recorded at recruitment. Subjects were then followed up in clinic at 3 months after the recruitment (Month 0) and Month 6 and Month 12 where baseline resting heart rate was taken (Month 0), spirometry was done, and CAT score completed. In between, there were 2 telephone interview follow up where exacerbation history was asked (Month 3 and 9).

Results:

A total of 147 patients were recruited in this study. The mean age of our patients was 66.76 ± 9.25 year. 76.9% of patients had higher resting heart rate (> 80 bpm). The mean resting heart rate was 86.91 ± 13.01 bpm. The higher resting heart rate patients had a significantly higher proportion of exacerbators compared to the lower resting heart rate group at month 3 (54.4% vs. 26.9%, $p=0.013$). The trend was followed through until month 9. There were also statistically significant moderate strength linear correlation between resting heart rate and exacerbation frequency per epoch at month 3, month 6 and month 9 ($r = 0.400$, $p < 0.001$; $r = 0.440$, $p < 0.001$; and $r = 0.416$, $p = 0.004$). The mean exacerbation frequency (per epoch) was also

significantly higher in the higher resting heart rate group at month 3 and month 6 (2.00 vs. 0.48, $p < 0.001$; and 3.42 vs. 1.14, $p = 0.004$). There was a significant positive correlation between resting heart rate and CAT score at month 6 ($r = 0.312$, $p = 0.011$). However, this study did not identify any relationship between resting heart rate and FEV₁ percentage predicted.

Conclusion:

COPD patients with higher resting heart rate following exacerbation requiring hospitalisation demonstrated increased risk of exacerbation, with higher exacerbation frequency seen at 3, 6 and 9 months of follow up. There was also an association with symptoms assessed by CAT score at 6 months.