



1080 - RESPIRATORY EFFECTS AND SAFETY OF AN INTERMITTENT STANDING POSITION DURING MECHANICAL VENTILATION

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Abstract

INTRODUCTION. Ventilating patients with acute lung injury (ALI) in supine position potentially leads to an impaired pulmonary gas exchange. Prone position (PP) is an attractive means to improve ventilation-perfusion (V/Q) ratio^{1,2} but has several contraindications and showed no improvement in survival so far.³ Another therapeutical option is an upright position, which is easy to perform and has theoretical advantages over PP: the upward shift of the abdominal compartment is less pronounced, thus increasing thoraco-abdominal compliance.² However, to date regimes of an upright position did not tilt patients more than 45°.⁴

OBJECTIVES. We hypothesised that a 60° standing position (SP) during mechanical ventilation may improve respiratory function. Furthermore, we aimed to determine the feasibility of a SP for 2 hours during mechanical ventilation.

METHODS. We studied 30 adult patients, receiving mechanical ventilation for more than 48 hours in the intensive care unit of an university hospital. After recording baseline data, patients were placed in a 60° SP with the body entirely straight. Further data sets were recorded during 2 hours in SP, and after patients position was readjusted to supine position.

RESULTS. Functional residual capacity (FRC) increased immediately after reaching SP ($p < 0.001$) and remained elevated after repositioning to supine position. $\text{PaO}_2/\text{FiO}_2$ ratio and compliance decreased initially during SP, but increased ($p < 0.05$) after patients were retransferred to supine position. Haemodynamic variables remained stable under a moderate increase of doses of catecholamines during the study period.

CONCLUSIONS. Changes in respiratory function during SP are probably explained by a downward shift of the diaphragm due to gravitational forces² leading to an increased FRC but not altering V/Q ratio as demonstrated by the $\text{paO}_2/\text{FiO}_2$ ratio. After reaching the initial supine position the opening of the lung proved by the elevated FRC is the predominant effect now associated with an increase in oxygenation as reflected by the $\text{paO}_2/\text{FiO}_2$ ratio due to an optimised V/Q ratio. Our results are confirmed in a subgroup analysis for 9 patients meeting ALI criteria. Ventilating patients in SP may be a new therapeutical approach to improve respiratory function in patients with ALI.

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