

# Positive Pressure Ventilation Therapy for Improvement of Symptoms and Physiological Measurement in Acute Mountain Sickness: A Systematic Review and Meta-Analysis

Mohammad Satrio Wicaksono(1), Achmad Ivka Raehan(1), I Nyoman Sebastian Sudiasa(1), Eisy Akmel Naila(1)

1- Medical Student Universitas Diponegoro, Semarang, Central Java

## Introduction

Acute mountain sickness (AMS) is a high altitude disease characterized by headache, dizziness, fatigue, and gastrointestinal symptoms. AMS leads to hypobaric hypoxia and potentially develops into dangerous conditions such as pulmonary or cerebral edema. Current pharmacological treatments such as acetazolamide, dexamethasone, and analgesics have not been proven to be consistently effective to prevent AMS and shown unpleasant adverse effects. Alternatively, positive pressure ventilation therapy has shown some promising results in treating AMS.

## Objective

The aim of this systematic review and meta-analysis is to evaluate the efficacy of positive pressure ventilation therapy in improving symptoms and physiological measurement in acute mountain sickness.

## Method

This systematic review and meta-analysis was reported based on the PRISMA statement. The literature search was conducted on several databases, such as PubMed, Cochrane, Science Direct, and Scopus. Results were shown as mean difference (MD) and standard deviation (SD). A fixed-effect model (FEM) was used when the included studies were considered homogenous), which were indicated by an I<sup>2</sup> value less than 40%. Risk of bias was assessed using the cochrane risk-of-bias tool for randomized trials (RoB 2).

## Result

This systematic review and meta-analysis included four randomized control studies with the total of 277 participants. Lake Louise Score declining with a significant pooled mean difference (MD) of -1.16 [95% CI: (-1.90) - (-0.41), P = 0.002].

Arterial oxygenation improvement with a significant pooled MD of 4.13 [95% CI: (-0.83) - 9.08,  $P < 0.00001$ ]. Heart rate measurement showed no significant effect, MD of -0.19 [95% CI: (-7.26) - 6.68,  $P = 0.96$ ]

### Conclusion

This systematic review and meta-analysis showed evidence that positive pressure ventilation therapy is a prospective therapy to significantly improve acute mountain sickness symptoms and arterial oxygenation, but has no significant effect on heart rate.

### Keywords:

*Acute mountain sickness; Review; meta-analysis; ventilation therapy*