INPLASY

The Effectiveness of Respiratory Muscle Training on Activities of Daily Living and Respiratory Complication in Stroke Patients -Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

INTRODUCTION

Review question / Objective What is the effectiveness of respiratory muscle training on Activities of Daily Living (ADL) in patients suffered from stroke? What is the incidence rate of stroke related respiratory complication after the respiratory muscle training intervention?

Rationale The aim of this review is to investigate the effectiveness of respiratory muscle training (RMT) impact on the activities of daily living, and the influence of respiratory complication which mostly in stroke related pneumonia.

Condition being studied Reduced respiratory muscle strength has been observed in persons with stroke. These respiratory muscle weaknesses after stroke are induced by lesions of the central nervous system. As a result, the respiratory dysfunction in stroke survivors leads to progression of restrictive respiratory disease. It has been shown that respiratory muscle training can improve cardiac and circulatory function in patients with heart failure and decreased left ventricular ejection fraction. There comes other literature showed that respiratory muscle training can improve the lung function and lung physiology-related parameters of patients after stroke. Based on the Biopsychosocial Medical Model, the post-stroke patients will ultimately return to every day life. To understand the relationship between improvement of pulmonary function and activities of daily living, the quantitatively analysis should be applied. Stroke related pneumonia, which stands for one of respiratory complication, was reported in some studies, although the mechanism underline was still progression. Another aim of this study was to evaluate the effectiveness of RMT on respiratory complication in patients suffered from stroke.

METHODS

Search strategy The searching strategies will be adjusted according to different Databases, take Scopus as an example, the following strategy will be applied:

(TITLE-ABS-KEY ("stroke" OR "strokes" OR "cerebral" OR "cerebrovascular") AND TITLE-ABS-KEY ("respiratory muscle training" OR "inspiratory muscle training" OR "expiratory muscle training" OR "diaphragm") AND TITLE-ABS-KEY ("functio*" OR "activity" OR "Quality of life" OR "respiratory complication" OR "pneumonia" OR "respiratory infection" OR "pulmonary infection" OR "inflammat*")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Chinese")).

Participant or population The patients that diagnosis in stroke either hemorrhage or ischemic based on radiological imaging exam (CT / MRI / DSA).

Intervention The respiratory muscle training included respiratory muscle, inspiratory muscle, expiratory muscle, and diaphragm stimulation, or with other intervention involved was categorized as intervention group.

Comparator Other non-respiratory muscle training, or sham RMT was deemed as control group.

Study designs to be included The randomize control trial or non-randomize control trial studies were all be included in this review.

Eligibility criteria
(1) Human studies were considered with patients aged ≥ 18 years old;
(2) Patients were diagnosed of Stroke based on any neuroradiological examination that listed below (e.g. intra-arterial angiography (DSA), magnetic resonance imaging (MRI), computed tomography (CT));
(3) The outcome measurement for the efficacy of RMT in the research should include either pulmonary functional assessment, Activities of Daily Living or Health Related Qulity of life, as well as the incidence rate of respiratory complication which mostly represented by stroke related pneumonia or pulmonary infection.

Information sources This review included 6 electronic databases: Pubmed / Medline, Scopus, EBSCOhost, Web of Science, CNKI (China), and Wangfang (China).

Main outcome(s) The Activities of Daily Living was represented by either Barthel Index, Modified Barthel Index, or Health related Quality of Life.
The respiratory complication was observed and represented by the incidence rate of pulmonary infection or pneumonia, as well as the measurement of Pulmonary Aspiration Scale.
The effectiveness of RMT on ADL and respiratory complication should be quantitatively analyzed.

Data management The articles were pull into EndNote for duplication checking and further management. Throughout the articles screening step and data extraction, the Micro Excel had been setup for document recoding.

Quality assessment / Risk of bias analysis The RoB-2 for RCT and RoBINS-I for non-RCT.

Strategy of data synthesis The meta-analysis will be conducted by SPSS v.29.

Subgroup analysis Subgroup analysis will be conducted according to different outcome measurement tool or different demographic baseline.

Sensitivity analysis The sensitivity analysis was performed in SPSS v.29 by Trim-and-fill method for meta-analysis. The heterogeneity analysis was reported in I2 value.

Language restriction Both English and Chinese.

Country(ies) involved Malaysia and China.

Keywords Stroke; Respiratory Muscle Training; Activities of Daily Living; Respiratory Complication; Meta-analysis.

Contributions of each author
Author 1 - Lili Lin as a major role of idea generation involved in all process included searching, screening, data extraction and synthesis.
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