



Review

The effect of exercise therapy in head and neck cancer patients in the treatment of radiotherapy-induced trismus: A systematic review



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SUMMARY

Trismus is characterized by a reduced ability to open the mouth, directly affecting many aspects of daily life, such as chewing, swallowing, speaking and maintaining oral hygiene. Several studies have shown that trismus affects health related quality of life. Radiotherapy in the head and neck area is identified as one of the most frequent causes of trismus in head and neck cancer (HNC) patients. Currently, there is no standard treatment for trismus. Several stretching techniques and jaw mobilizing devices are available, but their effect in radiotherapy-induced trismus is still largely unknown. With this review we give an overview of the present relevant literature and compare the effect of exercise therapy versus no exercise therapy on jaw mobility, expressed in millimeters mouth opening, in HNC patients with radiotherapy-induced trismus. A systematic literature search in four electronic bibliographic databases was conducted in July 2014. Selected articles were critically appraised on relevance and validity. Best available evidence was analyzed and compared. Three of the four selected articles show a significant increase (p -value < 0.05) in maximal interincisal opening (MIO) after exercise therapy using a jaw-mobilizing device. One article reports a significant decrease in MIO. However, this decrease is less in the intervention group, which implies a positive effect of exercise therapy. Based on this current best clinical evidence, it can be assumed that exercise therapy with a jaw-mobilizing device yields better results than no exercise, with regards to opening of the mouth in HNC patients with radiotherapy-induced trismus.

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Background

Trismus is characterized by a reduced ability to open the mouth, directly affecting many aspects of daily life such as chewing, swallowing, speaking and maintaining oral hygiene. Consequently, it can lead to malnutrition, weight loss and difficulty with dental treatments, leading to tooth decay [1,2]. Several studies have shown that based on this daily life interference, trismus is negatively associated with measured health related quality of life [3,4].

Current studies use different cut-offs for the maximal interincisal opening (MIO), varying between 20 mm and 40 mm. A cut-off distance of ≤ 35 mm MIO as proposed by Dijkstra et al. is widely used in the research on trismus in head and neck cancer (HNC) patients [5]. The prevalence of trismus in HNC patients

varies widely from 8% to 62% [6]. This wide range is explained by the differences in the populations studied, such as differences in tumor site, type of treatment, and criteria used to define trismus. The aetiology of trismus in HNC patients includes damage and fibrosis of the mastication muscles, which can be caused by surgery, effect of the tumor itself, radiotherapy, or a combination thereof [7]. Radiotherapy is identified as one of the most frequent causes of trismus in HNC patients, leading to loss of function and range of motion. The pathophysiology of radiation-induced fibrosis includes initial inflammation, followed by an (irreversible) atrophic and fibrotic phase [8]. Worsening of trismus occurs mainly during the first nine months post-irradiation, but may continue for multiple years [9]. As yet, there is still no standard treatment of trismus. Several stretching techniques and jaw-mobilizing devices are available, including the TheraBite® System and the Dynasplint® Trismus System [10]. Although some of these treatments are effective in trismus in general [11–15], their value for the treatment of radiotherapy-induced trismus is largely unknown. With this review we give an overview of the present relevant

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literature and compare the effect of exercise therapy versus no exercise therapy on jaw mobility, expressed in millimeters mouth opening, in HNC patients with radiotherapy-induced trismus.

Material and methods

Search strategy and selection

A systematic search in PubMed, Embase, the Cochrane Library and PEDro was performed on July 4th 2014, with a syntax containing relevant synonyms for 'head and neck cancer', 'exercise therapy' and 'trismus' (Appendix 1). Two reviewers (A.S. and A.v.W.) independently screened the titles and abstracts of the collected articles and included only articles reporting original study data on the effect of exercise therapy on radiotherapy-induced trismus in HNC patients (see Fig. 1 for inclusion- and exclusion criteria). Systematic reviews, opinion papers, conference papers, animal studies and case reports were excluded. Subsequently, potentially relevant articles were screened full-text. Articles written in languages other than English or Dutch were not selected. In addition,

a cross-reference and related article search was performed to minimize the amount of missed relevant articles. If reviewers disagreed on the relevance of an article, consensus was reached through discussion.

Critical appraisal

Using predefined criteria, A.S. and A.v.W. independently assessed the selected articles for their relevance and validity. Relevance concerned the measure in which the article applied to the subject. Validity concerned selection bias, information bias and the quality of analysis (see Table 1, legend for further information). If there was any disagreement between the reviewers, consensus was reached through discussion. Studies were classified as having a moderate or high relevance if they satisfied two or three criteria respectively. Studies were classified as having a low validity if they satisfied less than five criteria. Studies were classified as having a moderate validity if they satisfied five or six criteria. The remaining studies were classified as having a high validity. All studies with low relevance or validity were excluded.

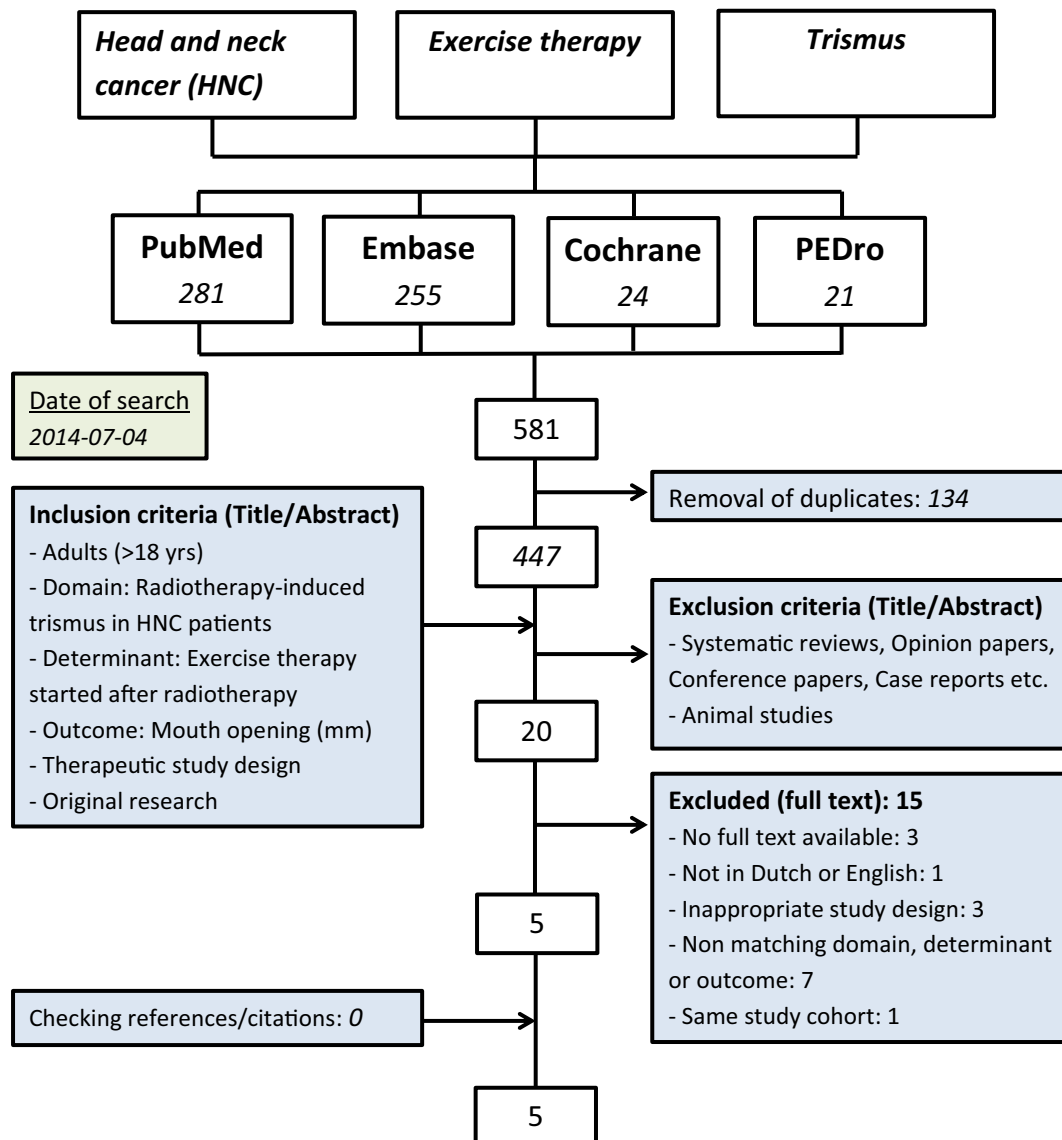


Fig. 1. Flowchart.

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