Effects of physiotherapy treatment in patients with bronchial asthma

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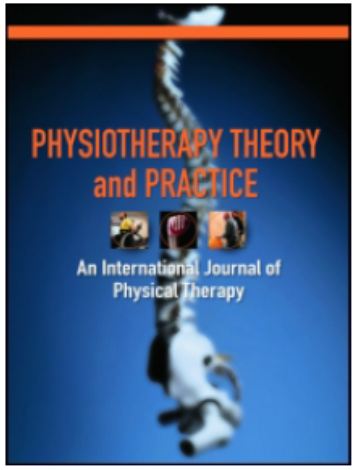

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Physiotherapy Theory and Practice

An International Journal of Physical Therapy

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iptp20

Effects of physiotherapy treatment in patients with bronchial asthma: A systematic review

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To cite this article: Daniel Garagorri-Gutiérrez & Raquel Leirós-Rodríguez (2020): Effects of physiotherapy treatment in patients with bronchial asthma: A systematic review, Physiotherapy

Introduction

- Bronchial asthma (BA) is a chronic inflammatory disease of the respiratory tract, whose pathogenesis involves cells and mediators of inflammation conditioned, in part, by genetic factors.

Introduction

- It is characterized by respiratory symptoms such as wheezing, shortness of breath, limited expiratory air flow, chest tightness and cough.

Introduction

It is one of the most frequent chronic diseases in the world and it affects about 300 million people. In the last 30 years the prevalence of this disease has increased in industrialized countries, which is apparently related to the greater proportion of the population that lives in urban settings but it seems to have stabilized in values of 10 to 12% in adults and 15% in children.

physiotherapy treatment

The physiotherapy treatment aims to reduce the frequency of asthmatic spells and the intensity of symptoms.

During asthma attacks, the main thing is to control the symptoms, achieve good ventilation, control the respiratory rate and relax the breathing muscles.

Objective:

- The objective of this review was to critically evaluate the available evidence on the effectiveness of different physiotherapy interventions in asthmatic patients.

Methods

- To achieve this, the search was focused on scientific databases with the key words Physiotherapy and Asthma. The search was limited to studies that evaluated the effects of a physiotherapy intervention in patients diagnosed with bronchial asthma.

Results

- 1794 articles were located and after the inclusion and exclusion criteria were applied, 12 studies were analyzed. Of these, 5 evaluated a respiratory reeducation intervention, 4 manual therapy techniques, 2 interventions based on therapeutic exercise and 1 relaxation techniques.

Table 2. Characteristics of the interventions of the studies analyzed

Authors	Intervention		Time of intervention	Number of sessions (frequency)	Improvements
	Experimental group	Control group			
Abdelbasset et al. (2018)	Moderate-intensity aerobic exercise	Only pharmacological treatment	10 weeks	30 sessions (3 per week)	- Improved quality of life, pulmonary function and VO_{2MAX}, and fatigue index.
Bruton et al. (2018)	Respiratory reeducation (self-guided by DVD or face-to-face)	Only pharmacological treatment	12 months	26 sessions (1 each 2 weeks)	- Improved quality of life.
Grammatopoulou et al. (2017)	Respiratory reeducation (holistic self-control plan)	Short manual with asthma information	12 months	7 sessions (all in the first month)	- Improved control of symptoms, apnea time, and FEV_1.- Decreased hyperventilation, capnography, respiratory rate.
Hupa (2015)	Manual therapy (thoracic mobility exercises) and postural drainage	—	22 years	*Not described*	- Improved patient's efficiency in controlling symptoms and attacks, and all spirometric values.
Leonés-Macías et al. (2018)	Manual therapy (diaphragm stretching technique)	Placebo (disconnected ultrasound)	1 day	1 session	- Improved PI_{MAX}, flexibility and mobility of the rib cage.
Löwhagen & Bergqvist (2014)	Manual therapy (Lotorp method)	Exercise program recommended by the Swedish National Board of Health and Welfare	6 weeks	2 sessions (one every third week)	- Improved thoracic expansion and PEF rate. - Decreased chest tightness and shortness of breath.
Majewski et al. (2015)	Physical activity (home pulmonary rehabilitation program)	—	8 weeks	24 sessions (3 per week)	- Improved PI_{MAX}, exercise tolerance, lower body flexibility, fatigue and quality of life.
Mayank & Khaund (2014)	Respiratory reeducation (diaphragmatic breathing exercises or Buteyko technique)	—	2 weeks	14 sessions (one per day)	- Higher improvements in FEV_1, PEF, and FEV1/FVC with Buteyko technique.
Pandey & Pandey (2015)	Manual therapy (craniosacral therapy and propioceptive neuromuscular facilitation)	—	5 weeks	7 sessions (frequency not described)	- Decreased wheezing, dyspnea and coughing attacks.
Romieu et al (2018)	Relaxation technique (sophrology) and conventional treatment (pharmacological and physiotherapy treatment)	Conventional treatment (pharmacological and physiotherapy treatment)	1 day	1 session	- Higher improvements in PEF, oxygen saturation and dyspnea with sophrology technique.
Shine et al. (2016)	Respiratory reeducation (diaphragmatic breathing exercises)	Pursed-lip expiration exercise	6 weeks	60 sessions (2 sessions each day, 5 days/ week)	- Improved chest expansion and PEF rate.
Tehrany et al. (2018)	Respiratory reeducation	—	16 weeks	3 sessions (frequency not described)	- Need less Salbutamol. - Improved asthma control and expiratory time. - Decreased hyperventilation, anxiety and depression levels.

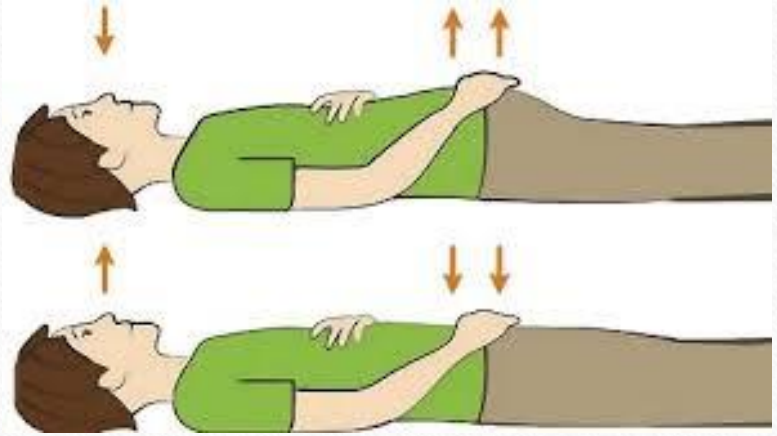
VO_{2MAX}: maximal oxygen uptake; FEV_1: Forced expiratory volume in 1 second; PI_{MAX}: maximal inspiratory pressure; PEF: peak expiratory flow; FEV1/FVC: forced expiratory volume in 1 second/forced vital capacity.
— not applicable

Manual therapy

- Löwhagen and Bergqvist (2014)
- Pandey and Pandey (2015)
- Leonés-Macías et al. (2018)
- Hupa case study (Hupa, 2015)

Respiratory reeducation

- Tehrany, DeVos, and Bruton (2018)
- Bruton et al. (2018)
- Grammatopoulou et al. (2017)
- Shine et al. (2016)
- Mayank and Khaund (2014)



Physical activity

- Abdelbasset et al. (2018)
- Majewski, Dabrowska, Pawik, and Rozek (2015)

Relaxation techniques

- Romieu et al. (2018)

Discussion

- The objective of this review was to evaluate the effects of physiotherapy treatments in patients with BA. In the light of the results obtained, to a greater or lesser extent, all physiotherapy interventions generate a positive impact on the clinical symptoms caused by BA.

Manual therapy

- Talking about the interventions that applied manual therapy, the most outstanding clinical improvements were obtained after the application of craniosacral therapy (Pandey and Pandey, 2015) managing to eliminate the wheezing and cough of the patient therefore leading to a decision of his pulmonologist for the medication withdrawal.

Manual therapy

- The other intervention that showed positive results was the study that applied the Lotorp method (Löwhagen and Bergqvist, 2014). In this case, the study achieved a significant improvement in PEF but, fundamentally, it merely managed to improve the dominant symptoms (chest pressure, gasping, wheezing and dyspnea).

Respiratory reeducation

- Regarding ventilatory reeducation, the most effective therapy was the one that applied a reeducation of the ventilatory pattern (Tehrany, DeVos, and Bruton, 2018). With this intervention, significant improvements were achieved in the results obtained by the PEF and the disappearance of anxiety and depression symptoms.

Respiratory reeducation

- Although the effectiveness of respiratory techniques seems to be established, it is very important to assess which of them is the one that provides the best results. In this case, it was found that the Buteyko technique obtained significant improvements compared to the technique of diaphragmatic exercises as far as lung function values are concerned.

Respiratory reeducation

- Hyperventilation did not obtain improvements in the study that applied a virtual ventilatory reeducation program (Bruton et al., 2018). Reeducation therapies of the ventilatory pattern (Tehrany, DeVos, and Bruton, 2018) and the holistic plan of asthma self-control (Grammatopoulou et al., 2017), both used face-toface, did manage to reduce this symptom.

Respiratory reeducation

- These results support the need to apply face-to-face interventions since in them the physiotherapist can teach the techniques, resolve doubts, correct possible postural or execution errors, motivate the patient and, ultimately, facilitate adherence to the reeducation program. The virtual intervention sought to replace the physiotherapist's function for economic reasons but it did not pay attention to these fundamental factors in a ventilatory reeducation program and, probably, due to this phenomenon, its results were worse.

Physical activity

- Among the physiotherapy interventions that applied therapeutic exercise (Abdelbasset et al., 2018; Majewski, Dabrowska, Pawik, and Rozek, 2015), it is worth highlighting the differences between them, one being applied in pediatric patients and the other in older women; one having moderate intensity, the other, having very low intensity. Despite of this fact, both interventions yielded positive results, showing significant improvements in respiratory functions and aerobic capacity.

Physical activity

- This means that therapeutic exercise is a valuable tool that adapts to the patients' capacity and baseline state, achieving positive results in all age groups.
- In any case, the intervention that yielded the best results corresponds to the study that applied a program of therapeutic exercise of moderate intensity (Abdelbasset et al., 2018), in which there were also significant improvements in the life quality.

Relaxation techniques

- Finally, the study that evaluated a sophrology intervention in combination with a physiotherapy program (Romieu et al., 2018), showed significant improvements in PEF, SpO2, and dyspnea. This implies the need to contemplate the inclusion of relaxation techniques in the treatment of BA since they do not seem to be widely used to address this pathology.

- Considering the complexity of the management of the patient with BA, due to the diversity of physical, psychological, social and economic factors, it is very difficult to address the treatment of the disease from a single health discipline. Currently, in the health system, the most widespread treatment is the pharmacological one, which only focuses on symptoms. Therefore, the multidisciplinary approach is interesting, in which the physiotherapist plays a justified role due to the results obtained from the applied therapies, achieving improvements at a physical level, life quality, disease control and also cost reduction by reducing medical visits and hospital admissions.

- In addition, it would be necessary to evaluate the application of physiotherapeutic intervention protocols by health institutions, so health managers should focus on this type of interventions with few or no side effects, with very low economic cost of application, high impact on life quality and high saving capacity for the health system.

conclusion

- In conclusion, the therapeutic possibilities that physiotherapy offers in the treatment of patients with BA are numerous. Currently, research carried out so far indicates that the interventions that can benefit patients the most are techniques based on the combination of respiratory reeducation and therapeutic exercise. Regardless of the type of therapy described in the studies, all patients showed some kind of improvement, which highlights that the simple act of performing an intervention that involves the patient in their pathology in a way, parallel to the conventional treatment, is a significant improvement over the usual medical treatment.