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ORIGINAL ARTICLE

Implementation of a guideline for physical therapy in the postoperative period of upper abdominal surgery reduces the incidence of atelectasis and length of hospital stay

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Guideline;
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Abstract
Objective: The aim of this study was to evaluate the effectiveness of implementing a physical therapy guideline for patients undergoing upper abdominal surgery (UAS) in reducing the incidence of atelectasis and length of hospital stay in the postoperative period.
Materials and methods: A ''before and after'' study design with historical control was used. The ''before'' period included consecutive patients who underwent UAS before guideline implementation (intervention). The ''after'' period included consecutive patients after guideline implementation. Patients in the pre-intervention period were submitted to a program of physical therapy in which the treatment planning was based on the individual experience of each professional. On the other hand, patients who were included in the post-intervention period underwent a standardized program of physical therapy with a focus on the use of additional strategies (EPAP, incentive spirometry and early mobilization).
Results: There was a significant increase in the use of incentive spirometry and positive expiratory airway pressure after guideline implementation. Moreover, it was observed that early ambulation occurred in all patients in the post-intervention period. No patient who adhered totally to the guideline in the post-intervention period developed atelectasis. Individuals in the post-intervention period presented a shorter length of hospital stay (9.2 ± 4.1 days) compared to patients in the pre-intervention period (12.1 ± 8.3 days) ($p < 0.05$).

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Conclusion: The implementation of a physical therapy guideline for patients undergoing UAS resulted in reduced incidence of atelectasis and reduction in length of hospital stay in the postoperative period.

PALAVRAS-CHAVE
Modalidades de fisioterapia;
Deambulação precoce;
Orientação;
Atelectasia pulmonar;
Internamento;
Cuidados pós-operatórios

A implementação de uma diretriz para a fisioterapia no período pós-operatório da cirurgia abdominal alta, reduz a incidência de atelectasia e o tempo de internamento

Resumo
Objetivo: O objetivo deste estudo foi avaliar a eficácia da implementação de uma diretriz de fisioterapia para doentes submetidos a cirurgia abdominal superior (UAS) na redução da incidência de atelectasia e no tempo de internamento no pós-operatório.
Materiais e Métodos: Foi usado um desenho de estudo de ''antes e depois com controlo histórico. O período ''antes'' incluiu doentes consecutivos que foram submetidos a UAS antes da implementação da diretriz (intervenção). O período ''depois'' incluiu doentes consecutivos após a implementação da diretriz. Os doentes no período pré-intervenção foram submetidos a um programa de fisioterapia onde o planeamento do tratamento foi baseado na experiência individual de cada profissional. Por outro lado, os doentes que foram incluídos no período pós-intervenção foram submetidos a um programa padronizado de fisioterapia com um foco no uso de estratégias adicionais (EPAP, espirometria de incentivo e mobilização precoce).
Resultados: Ocorreu um aumento significativo do uso de espirometria de incentivo e pressão expiratória positiva nas vias aéreas após a implementação das diretrizes. Além disso, observou-se que ocorreu o levantamento precoce em todos os doentes durante o período pós-intervenção. Nenhum doente que aderiu totalmente à diretriz no período pós-intervenção desenvolveu atelectasia. Os indivíduos no período pós-intervenção apresentaram um menor tempo de internamento hospitalar (9.2 ± 4.1 dias) em comparação com os doentes no período pré-intervenção (12.1 ± 8.3 dias) ($p < 0.05$).
Conclusão: A implementação de uma diretriz de fisioterapia para doentes submetidos a UAS resultou na redução da incidência de atelectasia e na redução do tempo de internamento no pós-operatório.

Introduction

Postoperative pulmonary complications (PPCs) are common in patients undergoing abdominal surgery and are responsible for the increased morbidity and mortality as well as length of hospital stay and health related cost of care.[1,2] The PPCs occur more frequently in surgeries where the incision is made above the umbilical scar, the so called upper abdominal surgeries (UAS).[3] The incidence of PPCs in these subjects is related to the existence of preoperative risk factors such as advanced age, smoking, malnutrition, obesity, lung diseases, and clinical diseases. Surgical and anesthetic factors such as the time of surgery, type of surgery, and the effects of anesthetic drugs on the respiratory system also contribute to the development of PPCs.[4]

Atelectasis, pneumonia, acute respiratory failure, tracheobronchitis, wheezing, and prolonged mechanical ventilation are the most commonly observed PPCs.[2] It is known that the decrease in lung volumes and capacities, abnormal respiratory pattern, abnormal gas exchange, and pulmonary defenses in patients undergoing open UAS start with anesthetic induction and perpetuate in the postoperative period, contributing to the occurrence of these PPCs.[5,6] The respiratory muscle dysfunction has also been attributed to the development of PPCs.[7,8] Multiple factors may be involved in diaphragmatic dysfunction, such as irritation and inflammation caused by trauma from manipulation close to the diaphragm, reflex inhibition of afferent abdominal receptors, and postoperative pain.[7]

In this context, physical therapy assistance to open UAS aims to preserve pulmonary function and reverse physiological and/or functional changes that may occur in the postoperative period due to these complications.[9,10] Therefore, physical therapy provides a variety of interventions that must be individually selected according to the needs of the patient. Chest physical therapy acting with thoracic expansion exercises and diaphragmatic breathing exercises immediately after the UAS appears to improve oxygenation without triggering increase in pain or other complications.[11] Furthermore, interventions that increase lung volume such as deep breathing exercises, incentive spirometry and continuous positive airway pressure (CPAP) are associated with lower frequency PPCs.[12] However, the number of clinical studies that highlight the benefits of applying prophylactic therapy in patients undergoing open UAS is still quite limited.[13,14]