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Difference between continuous positive airway pressure via mask therapy and incentive spirometry plus chest physiotherapy to treat or prevent post-surgical atelectasis: Prospective randomized study

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The most common cause of acute atelectasis is post-surgical atelectasis, characterized by restricted breathing after abdominal or cardiac surgery. Large doses of opioids or sedatives, tight bandages, chest or abdominal pain, abdominal swelling (distention), and immobility of the body increases the risk of acute atelectasis following cardiac surgery. All types of therapy such as IS, coughing and breathing exercises or CPAP have a valuable role play in the prevention or treatment of acute atelectasis. However, the type of therapy that should be used is not completely clear yet. This study aims to clarify the difference of effectiveness between CPAP therapy plus chest physiotherapy (CPT) and IS therapy plus CPT to treat or prevent post-operative atelectasis.

Seventy two post cardiac surgery patients who fit the inclusive criteria (smoker, hemodynamicly stable, the lungs are healthy and above 50 years old) participated in this study. The participants were divided randomly in two groups, the control group used IS 15 times per hour plus CPT every four hours for 3 days and the trial group used CPAP via mask (4-6 cm H2O) for half hour every two hours plus CPT every four hours. Both regimens applied only during the waking hours. Inspiratory capacity (IC) in litre was used to compare the two groups of therapy. It was measured by an Incentive Spirometer after the cardiac operation as baseline-test, after 12 hours from the start of each therapy, after 24hours, 48 hours and post therapy. At the same time, Respiratory Rate (RR), Heart Rate (HR) and Saturation of Oxygen via pulse oximetry (SpO2 %) were measured for both groups. Failure was defined as a need for advanced therapy such as mechanical ventilation and Bi-level Positive Airway Pressure (BiPAP). SPSS t-tests were used to examine the difference between the baseline and post therapy.

36 patients participated in each group (57 male and 15 female mean ages; 54 ± 6.8 years). IC was increased significantly in CPAP group (baseline mean for control group 1.23L and CPAP group 1.41L, post- therapy mean 1.59L and 1.98L respectively, p= 0.005) (figure1). SpO_2 was decreased significantly in control group (baseline 97.83%, 97.44%, post-therapy 96.56%, 97.11 respectively, p=0.037) and there was no significant difference in RR and HR.

Add Chest Physiotherapy (CPT) to CPAP via mask therapy for half an hour every two hours had better outcomes to re-open collapsed alveoli after major thoracic surgery especially in smoker and elderly patients.

Biography

Fouad AL Mutairi has completed his PhD in 2013 from University of Chester in UK. He is American board certified in respiratory care since 2005. He has published more than six papers and has been serving as clinical cardiopulmonary researcher at hospital and university in Saudi Arabia and United Kingdom. He also focused in the study of cardiovascular rehabilitation post CABG.

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