THE EFFECT OF HIGH FREQUENCY POSITIVE PRESSURE VENTILATION ON HYPOXIC PULMONARY VASOCONSTRICTION AND PULMONARY HAEMODYNAMICS DURING ONE LUNG VENTILATION

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Background:
High frequency positive pressure ventilation (HFPPV) is a technique of mechanical respiratory support based on the delivery of gases under conditions of constant flow and low pressure. HFPPV, with the advantage of quieter operating conditions and improved surgical access, can be safely applied when meticulous operation or haemostasis is required. The aim of this article was to evaluate the effects of the application of HFPPV to both lungs or to the non dependent lung during one lung.

Methods:
This controlled prospective randomized study was carried out from 2002- 2004 on thirty patients ASA physical status I and II, aged between 18 and 55 years scheduled for elective lung resection procedures were randomly assigned to three groups: group A: (n = 10) [conventional one lung ventilation], group B: (n = 10) [high frequency positive pressure ventilation], group C: (n = 10) [differential lung ventilation with unilateral HFPPV to the non dependent lung]. The intra - operative systemic and pulmonary haemodynamic and respiratory data were recorded and statistically analyzed.

Results:
The use of HFPPV was associated with significant decrease in MPAP, PAOP, SVRI, PVRI, and SVI, LVSWI, RVSWI, REF and, EtCO2, airway pressures. In addition, it was associated with significant increase in RVEDVI, PaCO2, a – EtCO2, SvO2, and CaO2, and CvO2. While the use of DLV was associated with significant decrease in CI, SVI, SVRI, and PVRI, LVSWI, RVSWI, RVEF, and a – EtCO2 In addition, it was associated with significant increase in PAOP, RVEDVI, SvO2, and PVO2, CvO2, and QS - QT.

Conclusion:
The use of HFPPV and DLV techniques during Lung resections are devoid of untoward haemodynamic effects and it may be a valuable adjunct to ventilate patients with preexisting pulmonary disease who require lung retraction during thoracotomy requiring one-lung ventilation.