TITLE: ALTERATION OF PULMONARY OXYGENATION BY PULMONARY ARTERY OCCLUDED PRESSURE MEASUREMENTS IN INTENSIVE CARE PATIENTS

AUTHORS: Yumiko Ishizawa, M.D., Shuji Dohi, M.D.
AFFILIATION: Anes. Dept., Univ. of Tsukuba, Tsukuba 305, Japan

A significant decrease in PaO2 occurs during pulmonary artery occluded pressure (PAOP) measurements in anesthetized, mechanically ventilated patients.[1,2] Since significant impairment in oxygenation may occur in patients with reduced pulmonary vasculature and with compromised pulmonary oxygenation, we studied to know whether PAOP measurements cause more serious hypoxemia in such patients in ICU.

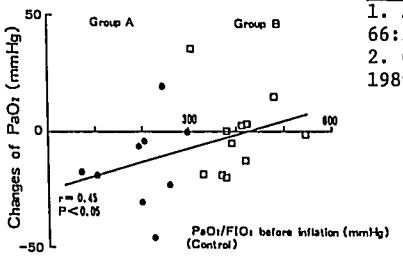
Methods: Studies were performed in 20 adult patients (36-76 yrs) who were admitted to the ICU for various conditions, including medical, cardiac, coronary and postoperative critical illness, and required PAC and mechanical ventilation. This study was approved by our local review committee. Patients were divided into 2 groups: the patients whose ratio of PaO2 to FIO2 (PaO2/FIO2) before the balloon inflation were less than 300 mmHg (group A) and those more than 300 mmHg (group B).

Location of the tip of PAC with inflated balloon was documented by a chest radiograph. In each patient, measurements of hemodynamic variables, end-tidal CO_2 (PetCO2) and arterial blood gas tensions were performed while the PAC balloon was still deflated. Then the balloon was inflated for 2 min with 1.5 ml of air and the measurements were repeated.

Results: There was a trend of decreasing PaO2 as a result of the balloon inflation in group A, but not in group B. A significant correlation between changes in PaO2 due to the balloon inflation and pre-inflation PaO2/FIO2 (fig. 1). Inflation of the PAC balloon also caused a slight but statistically significant increase in $PaCO_2$, and decrease in PetCO2 in both groups. No statistically significant change was found in any variables of hemodynamics due to the balloon inflation.

Discussion: The patients with reduced pulmonary vasculature do not develop a significant decrease in PaO2 during PAOP measurements unless their oxygenation is impaired. The more serious decrease in PaO2 in the patients with lower PaO2/FIO2 might be attributed to the existing higher degree of the ventilation-to-perfusion mismatching and possibly to changes in pulmonary vasoreactivity.

Correlation between Control Values of PaO_2/FIO_2 and Changes of PaO_2 during PAOP Measurement



References:
1. ANESTHESIOLOGY 66:216-220, 1987
2. Chest 96:367-371, 1989

TITLE : BACTERIOLOGIC ASSESSMENT OF THE LOWER RESPIRATORY TRACT USING THREE SAMPLING METHODS IN VENTILATED PATIENTS.

AUTHORS : L. PAPAZIAN MD, F. DERBEL MD, M. DI FRANCIA MD, J. CHARREL MD, F. GOUIN MD.
AFFILIATION : Anest. Dept. University of Marseille - Hôpital Sainte Marguerite - 270, Bd de Sainte Marguerite 13274 MARSEILLE CEDEX 9.

Bacteriologic diagnosis of pulmonary infections is still a difficult problem in ventilated patients(1). This study was designed to prospectively compare distal blind bronchial sampling (BBS), fiberoptic protected brush biopsy (FPBB) and broncho-alveolar lavage under fiberoptic control (BAL).

Fifty four comparisons were prospectively performed in ventilated patients (64 ± 20 years) with suspected nosocomial broncho-pneumonia (NBP). An empiric or specific antibiotic treatment was present in 59 % of patients. BBS was performed using a mucosity aspirator advanced as far as possible in the bronchial tree. FPBB was performed using a protected brush biopsy catheter (Microvasive, Watertown, MA). BAL was performed using the technique described by Johanson et al. (1). Order of samplings was randomized. During and after the sampling period, heart rate, arterial oxygen saturation and blood pressure were monitored. Samples were processed by the microbiology laboratory within 15 min. Direct examination of BBS and BAS was performed. Diagnosis criteria were : direct observation of organisms and polymorphonuclear leucocytes and absence of epithelial cells (2). Brush specimens, distal aspiration and BAL were cultured. A bacterial count ≥ 10^4 cfu/ml for BBS and ≥ 10^3 cfu/ml for BAL and FPBB was considered significant. Identical bacteriologic findings were obtained in 49 out of 54 BBS and FPBB (90.7 %), in 48 out of 54 BAL and FPBB(88.9%) and in 49 out of 54 BAL and BBS (90.7 %). Identical bacteriologic findings were obtained in 46 out of 54 BBS, FPBB and BAL (85.2 %). During FPBB samplings two cases of minor hemoptysis (< 50 ml) were observed. No case of pneumothorax was noted.

This study shows an excellent concordance between the 3 bacteriologic sampling methods of the lower respiratory tract in mechanically ventilated patients with suspectd or proven NBP. BBS was in concordance with FPBB and BAL in 90.7 % of patients. Techniques requiring fiberoptic procedures do not provide more information than a routine technique such as BBS (3).

References
1. Am Rev. Respir. Dis, 137, 259-264, 1988.
2. Am Rev. Respir. Dis. 135, 426-432, 1987.
3. Crit. Care Med. 14, 864-868, 1986.