Anesthesiology
V 75, No 3A, Sep 1991

ASA ABSTRACTS

A258

TITLE: RISK FACTORS FOR RESPIRATORY COMPLICATIONS AFTER CARDIAC SURGERY

AUTHORS: TL Higgins MD, JP Yared MD, L Paranandi MSHP, A Baldyga MD, NJ Starr MD

AFFILIATION: Dept. of Cardiothoracic Anesthesia, Biostatistics-Epidemiology, and Thoracic and Cardiovascular Surgery, The Cleveland Clinic Foundation, Cleveland, OH 44195

Introduction: Repiratory complications are an important cause of morbidity and mortality following coronary artery bypass grafting, and it would be helpful to predict these complications based on preop data.

Methods: Data on 4170 consecutive adult patients undergoing coronary artery bypass with or without concurrent valvular or carotid procedures during a two year period was examined. Respiratory complications were defined as one or more of the following: mechanical ventilation for >72 hrs, reintubation for respiratory distress, culture proven pneumonia or tracheitis requiring antibiotic therapy, respiratory arrest, tracheostomy, or adult respiratory distress syndrome. Factors considered were preoperative clinical findings, laboratory and demographic data. Univariate analysis was performed for each factor against respiratory complications, as defined above, to eliminate those not significant to at least $p \leq 0.05$. Logistic regression was performed using SAS (Cary NC).

Results: Pulmonary complications occured in 896 (21.5%). Factors significantly associated with respiratory complications by univariate analysis include emergency procedure, reoperation, preoperative serum creatinine (Cr) $\geq$ 1.9 mg%, severe left ventricular dysfunction, operation for mitral valve insufficiency, mitral valve stenosis, aortic insufficiency, and aortic stenosis, age $\geq$ 70 yrs, weight $\leq$ 65 kg, preoperative Hct $\leq$ 34%. a history of chronic obstructive pulmonary disease with or without bronchodilator therapy, prior TIA or stroke, prior vascular surgery, female gender,left main trunk disease, congestive heart failure at the time of surgery, or congestive heart failure by history. Factors not associated included current cigarette smoking, 40+ pack--year smoking history, room air $pO2 \leq 60$mmHg, or diabetes mellitus. Logistic regression results are as follows:

Factor	Coefficient	S.E.	odds ratio	(95% C.I.)
Current CHF	0.788	0.161	2.20	(1.60-3.01)
Emergency case	0.644	0.183	1.90	(1.33-2.72)
Reoperation	0.467	0.087	1.59	(1.34-1.89)
Preop serum Cr$\geq$1.9	0.447	0.176	1.56	(1.11-2.20)
COPD on medication	0.418	0.107	1.52	(1.23-1.87)
Aortic stenosis	0.366	0.155	1.44	(1.06-1.95)
Prior vascular surgery	0.289	0.110	1.34	(1.08-1.67)
Mitral insufficiency	0.282	0.127	1.32	(1.03-1.70)
Age/decade	0.154	0.043	1.17	(1.07-1.27)

(all significant to p<0.01 except mitral insufficiency, p=0.027) Constant= -2.646

Discussion: Congestive heart failure at the time of operation is the most important risk factor for postoperative pulmonary problems, and the presence of other factors listed above should alert the physician to increased risk of prolonged ventilation, respiratory failure requiring reintubation, pneumonia and adult respiratory distress syndrome. Such preoperative identification could promote cost-effective use of pulmonary function studies and interventional strategies such as selective digestive decontamination (1). Identification of the high-risk subgroup may also aid in preoperative counselling, perioperative management, and in outcome studies. Prospective evaluation of the logistic model is planned.

Reference: (1) Van Uffelen et al Crit Care Med 15:99-102, 1987.

A259

TITLE : OXYGEN DELIVERY (O_2D) AND CONSUMPTION (VO_2) IN BRAIN DEAD PATIENTS

AUTHORS : J. Matéo, M.D., O. Langeron, M.D., J.L. Pansard, M.D., M. Arthaud, M.D., S. Cohen, M.D., P. Viars, M.D.

AFFILIATION : Département d'Anesthésie, CHU Pitié-Salpétrière, Paris, France

Tissue hypoxia in brain dead donors could impair transplantation outcome. However, both O_2D/VO_2 relationship and the optimal O_2D remain unknown in these patients. Thus, this study was designed to assess the relationship between O_2D and VO_2 in brain dead patients.

Methods. After ethical approval, 11 hemodynamically stable brain dead patients were included in the study (27 ± 11 yrs). O_2D was calculated from arterial blood gas analysis and thermodilution cardiac output measurements obtained from a radial indwelling catheter and a Swan-Ganz catheter.VO_2 was independently measured using a rebreathing circuit adapted to a volume ventilator (Deltatrac, Datex). Blood lactate levels (BLL) were measured (N < 2.2 mmol/l). Increases and decreases in O_2D were obtained using G-suit inflation or Peep administration, respectively. The variability of VO_2 ($\S VO_2$) in control conditions was assessed by repeated measures (n = 20). A significant change in VO_2 was defined as an increase or a decrease greater than 2 $\S VO_2$ in each patient. Temperature was maintained constant throughout the study. Data are mean ± SD.

Results in control conditions are summarized in the table : 6 patients showed normal BLL (group 1) while the remaining 5 patients exhibited increased BLL (group 2). No significant difference was observed between the two groups regarding hemodynamic variables, VO_2 or O_2D (Student's t test). In group 1 increasing O_2D with G-suit inflation (+17 ± 9 %) or decreasing O_2D with Peep (-20 ± 7 %) was associated with no change in VO_2. In group 2, improving O_2D (+32 ± 15 %) significantly increased VO_2 in all patients (+17 ± 5 %), while decreasing O_2D was associated with a fall in VO_2 in only 2 patients.

	BLL < 2.5 (n = 6)	BLL > 2.5 (n = 5)	
Mean arterial pressure (mmHg)	82.5 ± 5.8	68.3 ± 2.3	NS
Heart rate ($b.min^{-1}$)	87.7 ± 16	103 ± 14.4	NS
Cardiac index ($l.min^{-1}.m^2$)	3.3 ± 0.8	3.5 ± 1.5	NS
Capillary wedge pressure (mmHg)	9.3 ± 5	7 ± 3	NS
$D(A-V)O_2$ ($ml.dl^{-1}$)	2.47 ± 0.5	3.05 ± 0.5	NS
O_2D ($ml.min^{-1}.m^2$)	405 ± 75	404.8 ± 190	NS
VO_2 ($ml.min^{-1}.m^2$)	100 ± 20	116 ± 13	NS

Conclusion. These preliminary results suggest that 1) O_2D and VO_2 in brain dead patients appear to be close to values usually observed in anesthetised patients (1) ; 2) two populations were identified concerning VO_2/O_2D relationship. Since no difference was observed between these populations regarding hemodynamic variables, BLL should be measured in these patients to assess VO_2/O_2D adequacy.

Reference : 1) Crit. Care Med., 1983 ; 11 ; 640-643