Introduction: Intra-abdominal hypertension (IAH) is defined as an intra-abdominal pressure (IAP) higher than 11 mmHg. IAH has been recognized as a cause of significant morbidity and mortality in critically-ill medical and surgical patients. The World Society of Abdominal Compartment Syndrome (www.wsacs.org) has published definitions and recommendations for IAP measurement as well as diagnostic criteria. They recommend that IAP be measured regularly in critically-ill patients who demonstrate risk factors for the development of IAH. Even if these risk factors are found in cardiac surgery patients, the prevalence of IAH in cardiac surgery has not been described. The aims of this study were, therefore, to establish in a cardiac surgical population the prevalence of IAH and the predisposing factors, if any, associated with IAH.

Methods: After obtaining approval from the research ethics board of our institution and informed consent, patients undergoing emergency or elective cardiac surgery were recruited. Intra-abdominal pressure were measured with Foley catheter after induction of anesthesia (pre-surgical) and before the patient leaves the operating room (post-surgical). Demographic, anthropometric, co-morbidities, hemodynamic and echocardiographic datas were collected for analysis. Statistical analysis was performed in relation with the presence or not of a normal distribution. In order to perform a linear regression that included 5 variables with a correlation (R2) of 0.025, a sample size of 191 patients was required in order to obtain a power of 80% with an alpha of 0.05 in order to obtain an increase in R2 of 0.03 per additional variable.

Results: Between May 2010 and June 2011, 191 patients were recruited. The mean age was 64±11 years. There were 151 men and 40 women with a mean Parsonnet score of 13±9. A total of 83 patients (43%) underwent simple coronary artery bypass graft surgery. Mean pre and postsurgical IAP were 12±4 and 13±5 mmHg. IAH was present in 55% and in 60% of the patients before and after surgery. Body mass index values were significantly higher in patients with IAH (p<0.0001) and obese patients had higher IAP (14±3 vs 11±5) (p<0.0001). Central venous pressure (16±4 vs 12±4) (p<0.0001), pulmonary capillary wedge pressure (20±5 vs 167±5) (p=0.007) and mean pulmonary artery pressure (29±5 vs 25±7) (p=0.0014) were higher in patients with IAH. Reduction in IAP after surgery was associated with the use of a nasogastric tube (p=0.0018). However, no statistically significant difference was found between the occurrence of renal failure, intensive care length of stay, length of hospitalization or mortality and IAP baseline values or variations.

Discussion: More than half of the patients going under cardiac surgery have IAH. IAH is associated with obesity, higher filling pressure and pulmonary hypertension. Further studies with larger population would be required to determine the clinical impact of IAP measurements in cardiac surgery.