**Introduction:**
The respiratory variations of the inferior vena cava (IVC) diameter in mechanically ventilated patients with preload responsiveness could be explained by a higher compliance of the IVC and/or higher respiratory variations of the IVC backward pressure, i.e., the central venous pressure (CVP). We aimed at determining the respective weight of these two phenomena.

**Methods:**
In 25 mechanically ventilated patients, haemodynamic, respiratory and the intra-abdominal pressure (IAP) signals were continuously computerised. CVP, IAP and the IVC diameter (transthoracic echocardiography) were recorded during end-inspiratory and end-expiratory occlusions, before and after the infusion of 500-mL of saline. Patients in whom fluid administration induced an increase in cardiac index (PICCO-2) ≥15% were defined as “responders”. The respiratory variations of the IVC diameter, CVP and IAP were calculated as (end-inspiratory - end-expiratory values) / mean value. The compliance of the IVC was estimated by the ratio between (end-expiratory - end-inspiratory) values of IVC diameter and CVP.

**Results:**
Fluid administration increased cardiac index by more than 15% in 9 patients. The respiratory variations of the IVC diameter predicted fluid responsiveness (area under the ROC curve: 0.799 (95%CI: 0.591-0.931), p<0.05). Before fluid administration, the compliance of the IVC was not different between responders and non-responders (0.75±0.32 vs. 0.79±1.14 mm/mmHg, p=0.91), whereas the respiratory variations of the CVP were higher in responders than in non-responders (36±24 vs. 20±10 %, p=0.03). The respiratory variations of the IVC diameter were associated with the respiratory variations of CVP (r=0.49, p=0.01) but not of IAP (r=-0.12, p=0.56).

**Conclusion:**
The respiratory variations of the IVC diameter rather depend on the respiratory variations of the CVP than on the IVC compliance. The IAP seems to not be involved in the respiratory variations of the IVC diameter.