

## **Preload responsiveness is associated with increased interleukin-6 and lower organ yield from brain-dead donors**

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**Objective:** Brain death induces dramatic changes in hemodynamics. Ischemic injury and inflammation resulting from inadequate resuscitation might influence organ yield for transplantation. Using functional hemodynamic monitoring in brain-dead organ donors, we test the hypothesis that donor preload (fluid) responsiveness is associated with increased inflammatory response and lower organ yield for transplantation.

**Design:** Prospective, observational, pilot study.

**Setting:** A large intensive care unit of a university hospital in the United States.

**Patients:** Twenty-one brain-dead organ donors between July 2006 and April 2007.

**Interventions:** None.

**Measurements and main results:** Following declaration of brain death, we collected data on donor demographics, mechanism of brain death, and number of organs procured and transplanted. Functional hemodynamics were monitored using pulse contour analysis technique. Plasma tumor necrosis factor, interleukin-6, and interleukin-10 concentrations were measured at study enrollment, after 4 hrs, and immediately before organ procurement for transplantation. Preload responsiveness (pulse pressure variation >13%) was observed in 48% of donors (mean +/- sd pulse pressure variation, 19.2% +/- 4.8%). Plasma interleukin-6 and tumor necrosis factor concentrations at study enrollment were greater in preload responsive donors: mean concentrations of interleukin-6 in preload responsive vs. unresponsive donors were 5420 +/- 9102 vs. 378 +/- 631 pg/mL ( $p = .009$ ), and mean concentrations of tumor necrosis factor were 60.5 +/- 103.6 vs. 15.7 +/- 10.1 pg/mL ( $p = .048$ ). Preload responsive compared with unresponsive donors had significantly increased interleukin-6 ( $p = .013$ ) and tumor necrosis factor ( $p = .044$ ) concentrations over time. Fewer organs were transplanted from preload responsive donors: mean organs transplanted from preload responsive vs. unresponsive donors were 1.8 +/- 0.9 vs. 3.7 +/- 2.5 ( $p = .034$ ). In multivariable regression, older donor age ( $p = .028$ ) and increased plasma interleukin-6 concentration ( $p = .035$ ) were significantly associated with lower number of organs transplanted.

**Conclusions:** Preload responsiveness is common in brain-dead organ donors and is associated with higher inflammatory response and lower organ yield. A controlled trial of preload optimization is warranted in brain-dead donors.