**A615 - Cardiac preload expansion and cardiac output as related to patient outcome**

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**Introduction:**
Cardiac function is known to be impacted by sepsis. Passive Leg Raise (PLR) is an effective method to predict fluid responsiveness (FR) or cardiac response to preload expansion. Preload functional status and trending cardiac output may identify patient phenotypes with varying cardiac reserve, dysfunction and outcome.

**Methods:**
Patient data were analyzed from a currently enrolling prospective randomized controlled study, evaluating the incidence of FR in critically ill patients with sepsis or septic shock (FRESH study, NCT02837731). Patients randomized to PLR guided resuscitation were classified as PLR+ (fluid responsive / preload dependent) if stroke volume (SV) increased ≥ 10% when measured with a non-invasive bioreactance device (Starling SV, Cheetah Medical). Patients were categorized into 5 different phenotypic cohorts based on changing physiology exhibited on PLR and trending cardiac output over the initial 72 hours of therapy.

**Results:**
A total of 269 PLR assessments were performed in 31 patients. Overall, 36% (96/269) of assessments indicated a patient was PLR+ after receiving initial resuscitation fluid of ~ 3L. Most patients (71%) demonstrated a dynamic physiology with changing PLR Status occurring > 1 time over 72 hours. There were no differences among the 5 groups with respect to age, gender, or QSOFA score (Figure 1). Patients in Group 1 exhibited a significantly decreased ICU stay (113.8 hours) compared to Group 3 (271.1 hours, p=0.024) (Figure 2). Patients in Group 3 exhibited significantly increased ECHO evidence of LV/RV cardiac dysfunction (77%), compared to Group 1 (16%, p=0.02) (Table 1). Patients in Group 4 exhibited 100% evidence of ECHO based LV/RV cardiac dysfunction.

**Conclusion:**
Physiological based resuscitation phenotypes identify significantly different patient groups. Patients who are initially not PLR+, but then become PLR+ with no improved CO are significantly more likely to have confirmed LV/RV dysfunction and a significantly longer ICU stay.

**Table 1:**

<table>
<thead>
<tr>
<th>SV</th>
<th>ECHO LV/RV Dysfunction</th>
<th>-</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 3</td>
<td>-</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Grp 1</td>
<td>+</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Chi Square</td>
<td>P</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

**Image 1:**

**ECHO Documented LV/RV Dysfunction**
Physiologic Phenotypes Based on PLR and Trending Cardiac Output

**Image 2:**

**Average ICU LOS**

*Graph showing the average ICU LOS with P<0.05.*

- Group 1: Initial PLR+, stays PLR+, CO improves by 72 h
- Group 2: Initial PLR-, becomes PLR+, CO improves by 72 h
- Group 3: Initial PLR+, becomes PLR-, no improvement in CO by 72 h
- Group 4: Initial PLR-, stays PLR-, no improvement in CO by 72 h
- Group 5: Initial PLR-, no improvement in CO by 72 h