**A583 - The relationship between transpulmonary pressure, end expiratory lung volume and intraabdominal pressure in patients with respiratory and intraabdominal pathologies**

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**Introduction:**
Measuring transpulmonary pressure (P_L), end expiratory lung volume (EELV) and intraabdominal pressure (IAP) is a new approach for setting parameters in mechanical ventilation. We analyzed the relationship between these parameters in two challenging patient groups: group 1 with ARDS or severe pneumonia and group 2 with intraabdominal hypertension or BMI>45.

**Methods:**
Intensive care patients at the hospital Bergstrasse (Heppenheim, Germany), requiring mechanical ventilation > 72h, were included in the study. Esophageal pressure (Pes), EELV and IAP were measured daily at 3 PEEP levels: 15, 10 and 5. Pes was measured via nasogastric catheter with an esophageal balloon, EELV – by nitrogen washout method and IAP as bladder pressure through a bladder catheter. Patients were in supine position and under full muscle relaxation. Tidal volume – 6ml/kg. P_L and chest wall elastance (Ecw) were calculated using the elastance-derived method [1].

**Results:**
18 Patients (N=18) were included in the study (N1=9; N2=9). In 53 measurements (N1=25; N2=28) there was no difference between groups regarding EELV (p>0.05). At PEEP of 5, patients in group 2 had higher Pinsp, Pes and IAP (Pinsp 22±4 vs 18±2, p<0.01); (Pesmin 11.8±4 vs 9.9±3.5, p=0.04); (IAP 11.1±3 vs 8.7±3, p<0.01) [Tab1]. There was a strong positive correlation between EELV and Cstat at PEEP 5 (R=0.7, p=0.02), as well as Cstat and end expiratory PL (PLexp) (R=0.6, p<0.01) [Fig1]. In group 2 we saw a strong correlation between IAP and Ecw (R=0.6, p<0.01) and mild correlation between IAP and Cstat (R=0.4, p=0.02) [Fig2].

**Conclusion:**
Higher transpulmonary end expiratory pressure ensures better Cstat. In patients with intraabdominal pathology, the chest wall elastance strongly depends on the intraabdominal pressure.

**References:**

**Table 1 :**

<table>
<thead>
<tr>
<th>PEEP 5</th>
<th>group 1</th>
<th>group 2</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EELV</td>
<td>1226±547</td>
<td>1271±519</td>
<td>0.391</td>
</tr>
<tr>
<td>Cstat</td>
<td>55 ±21</td>
<td>52 ±18</td>
<td>0.062</td>
</tr>
<tr>
<td>Pinsp</td>
<td>18.2 ±2.8</td>
<td>22.3 ±4.5</td>
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<tr>
<td>Pesmin</td>
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<tr>
<td>Pesmax</td>
<td>13.7 ±3.2</td>
<td>16.9 ±4.3</td>
<td>0.002</td>
</tr>
<tr>
<td>ΔPL</td>
<td>9.5 ±2.9</td>
<td>10.7 ±4.8</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Differences between groups, showed in mean values ± standard deviation

IAP | 8.7 ±3.2 | 11.1 ±3.3 | 0.007

**Image 1:**

A strong correlation between end expiratory transpulmonary pressure (P_{Lendexp}) and static compliance (C_{stat}) at PEEP 5.

**Image 2:**

A strong correlation between IAP and Ecw and a mild correlation between IAP and C_{stat} at PEEP level of 5 in patients with intraabdominal pathologies.