MAP 73 mmHg (13, 37 to 120), HR 101 beats/minute (22, 51 to 172), CVP 12 mmHg (5, 1 to 29), UP 55 ml/hour (62, 0 to 500), SL 3.2 mmol/l (3, 1 to 18.6), CI 4.1 l/min/kg (1.1, 1.6 to 6.7), GEDI 871 ml/m² (210, 500 to 1,691), ELWI 11 ml/kg (5.4 to 23), PT 32.1 C (2.8, 26.4 to 38), and SvO₂ 75% (8, 39 to 93). Relevant and significant (P < 0.005) PCGs between HPS and SL were respectively: MAP = 0.417, HR = 0.195, UP = 0.237, SvO₂ = 0.204 and PT = 0.569. Figure 1 shows the relation between two HPS with the highest correlation with SL.

Conclusion The conventional HPS MAP, HR, UP and SvO₂ are significantly correlated to levels of SL, but clinical value might be limited due to the relatively low correlation coefficients. In a small subgroup, PT is better correlated to the level of SL.

P174 Delayed assessment of serum lactate in sepsis is associated with an increased mortality rate
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Introduction Lactate assessment early in the resuscitation of sepsis has been recommended as a diagnostic biomarker. An abnormal lactate, independent of blood pressure, is an indication for aggressive fluid resuscitation and its normalization is a recommended endpoint of resuscitation. The objective of this study was to evaluate the effect of the timing of lactate assessment on patient outcomes in sepsis.

Methods Data were compiled using the Clinical Vigilance for Sepsis (CV Sepsis) alert which identified consecutive patients from two hospital systems over 12 months at a 300-bed community hospital and over 24 months from a 500-bed academic tertiary care center. The CV Sepsis alert screens the EHR to identify the presence of infection based on a multifactor alert system including labs, vital signs, and treatment team documentation. A physician order for intravenous antibiotics was used as a surrogate for suspected infection. The database identified 37,160 consecutive patients treated for infection from a total of 216,550. Patients with a measured lactate were divided relative to its measurement within 3 hours (eLac) or for intravenous antibiotics was used as a surrogate for suspected infection. The database identified 37,160 consecutive patients treated for infection from a total of 216,550. Patients with a measured lactate were divided relative to its measurement within 3 hours (eLac) or greater than 3 hours (dLac) of sepsis identification as recommended by the Surviving Sepsis Campaign. The CV Sepsis alert was the reference standard for time zero. Patients were compared in each group for the occurrence of the primary outcome of in-hospital mortality.

Results A total 5,072 of 37,160 consecutive patients (13%) had a measured lactate. Sepsis patients experienced an overall 3% (1,186/37,160) mortality rate. In total, 4,153 (82%) patients had a measured lactate. Sepsis patients experienced an overall 3% (1,186/37,160) mortality rate. In total, 4,153 (82%) patients had a measured lactate. The average lactate level in each group did not account for this effect. The timing of the assessment, not the lactate level, was prognostic of outcome. The mortality benefit associated with lactate assessment within the 3-hour guideline suggests that an increased clinical awareness may lead to early initiation of time-sensitive interventions known to improve outcomes.

P175 Lactate clearance as a predictor of mortality in colorectal perforation
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Introduction The objective of this study was to determine whether lactate clearance (LC) is a significant indicator of mortality in patients with colorectal perforation. LC has been associated with mortality in heterogeneous critically ill patients, but its role as a predictor of mortality in homogeneous patients with colorectal perforation is unclear.

Methods We retrospectively analyzed the clinical data of patients who underwent emergency surgery for colorectal perforation and were admitted to the ICU of our hospital from January 2003 to August 2013. Patients with traumatic, iatrogenic, and appendicitis perforations were excluded. The primary endpoint was survival to hospital discharge. The modified Sequential Organ Failure Assessment (mSOFA) score, a customized SOFA score excluding the central nervous system component (1), was used for prognostic scoring. The mSOFA score and several clinical factors were analyzed by univariate analysis as possible predictors of survival. We collected lactate levels and base excess (BE) measured during surgery and at 6, 12, and 24 hours after the first measurement and calculated the respective LC values. The associations of initial blood lactate level, LC, and BE with mortality were assessed by receiver operating characteristics (ROC) curve and logistic regression analyses.

Results Of the 61 patients identified, five were excluded as their ICU stay was <24 hours. The overall mortality in the remaining 56 patients (mean age of 76.7 ± 10.4 (SD) years) was 21.4%. In univariate analysis, mSOFA and several other variables correlated significantly (P < 0.05) with mortality. The area under the ROC curve for LC at 6, 12, and 24 hours was 0.601, 0.719, and 0.731, respectively. LC at 24 hours was the most accurate, and its optimum cutoff value was 37.5%. LC, lactate level, and BE at 24 hours, as well as the significant factors in univariate analysis, were entered into a stepwise logistic regression model, which revealed 24-hour LC ≤37.5% (odds ratio (OR), 23.0) and mSOFA score (OR, 2.1) as independent predictive values of mortality.

Conclusion In patients with colorectal perforation, 24-hour LC is more accurate than LC measured at earlier time points. Patients with 24-hour LC ≤37.5% and a high mSOFA score have a high risk of in-hospital mortality.

Reference

P176 Lactate quartile concentration and prognosis in severe sepsis and septic shock
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Introduction The Surviving Sepsis Campaign (SSC) indicates that a lactate (LT) concentration greater than 4 mmol/l indicates early resuscitation, sepsis sepsis treatment bundles. However, several recent studies have suggested that LT values lower than 4 mmol/l may be a prognostic maker of adverse outcome. The aim of this study was to identify clinical and analytical prognostic parameters in severe sepsis (SS) or septic shock (ShS) according to quartiles of blood LT concentration.

Methods A cohort study was designed in a polyvalent ICU. We studied demographic, clinical and analytical parameters in 148 critically ill adults, within 24 hours from SS or ShS onset according to SSC criteria. We tested for differences in baseline characteristics by lactate interval using a Kruskal–Wallis test for continuous data or a chi-square test for categorical data and reported the median and interquartile ranges; SPSS version 15.0 (SPSS Inc., Chicago, IL, USA).

Results We analyzed 148 consecutive episodes of SS (16%) or ShS (84%). The median age was 64 (interquartile range, 48.7 to 71) years; male: 60%. The main sources of infection were respiratory tract 38% and intra-abdomen 45%; 70.7% had medical pathology. Mortality at 28 days was 22.7%. Quartiles of blood LT concentration were quartile 1 (Q1): 1.87 mmol/l or less; quartile 2 (Q2): 1.88 to 2.69 mmol/l; quartile 3 (Q3): 2.7 to 4.06 mmol/l, and quartile 4 (Q4): 4.07 mmol/l or greater (Table 1). The median LT concentrations of each quartile were 1.43 (Q1), 2.2 (Q2), 3.34 (Q3), and 5.1 (Q4) mmol/l (P < 0.001). The differences between these quartiles were that the patients in Q1 had significantly lower APACHE II scores (P = 0.04), SOFA score (P = 0.024), number of organ failures (NQF) (P < 0.001) and ICU mortality (P = 0.028), compared with patients in Q2, Q3 and Q4. Patients in Q1 had significantly higher...
cholesterol \((P = 0.06)\) and lower procalcitonin \((P = 0.05)\) at enrolment. At the extremes, patients in Q1 had decreased 28-day mortality \((P = 0.023)\) and, patients in Q4 had increased 28-day mortality, compared with the other quartiles of patients \((P = 0.009)\). Interestingly, patients in Q2 had significant increased mortality compared with patients in Q1 \((P = 0.043)\), whereas the patients in Q2 had no significant difference in 28-day mortality compared with patients in Q3.

**Conclusion** Adverse outcomes and several potential risk factors, including organ failure, are significantly associated with higher quartiles of LT concentrations. It may be useful to revise the cutoff value of lactate according to the SSC (4 mmol/l).

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**P177**

**Correlation between arterial lactate and venous lactate in patients with sepsis and septic shock**

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**Introduction** Measurement of arterial lactate (A-LACT) levels has been used to monitor poor tissue perfusion, predicting mortality and guiding resuscitation. Peripheral venous lactate (V-LACT) has been regarded as an unreliable test, but a less invasive approach. We aimed to determine correlation between A-LACT and V-LACT and agreement of both in order to determine the usefulness of V-LACT as a biomarker for assessment in sepsis.

**Methods** We conduct a prospective, cross-sectional study during June to December 2011 at a university hospital. Septic patients in the ICU were enrolled in this research. Sepsis was defined according to the Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2008. The exclusion criteria were: contraindication for arterial puncture; and denying inform consent. The venous lactate would be sampled at the same point in time as arterial lactate measurement. The correlation and agreement between arterial and venous lactate was the primary outcome.

**Results** A total of 73 pair-samples in 45 intensive care patients were collected. Mean age was 68.33 ± 14.5 years. Fifty percent of all patients received the vasopressors to stabilize hemodynamics. The mean serum creatinine level was 2.78 mg/dl and the mean anion gap was 13.55 mmol/l. The mean arterial lactate (A-LACT) level was 3.73 ± 4.0 mmol/l, and the mean venous lactate (V-LACT) level was 4.6 ± 4.2 mmol/l. The A-LACT and V-LACT were strongly correlated as shown in Figure 1 \((r = 0.927, P < 0.0001, r^2 = 0.859)\). The mean difference between V-LACT and A-LACT was 0.889 mmol/l. The 95% limits of the V-A difference in the individual patients were between –2.3 and 4.1 mmol/l. However, the agreement looks very good at lactate levels not higher than 4 mmol/l (Figure 2). The regression equation was: A-LACT = (0.877 × V-LACT) – 0.320.

**Conclusion** The arterial lactate and venous lactate levels were strongly correlated in the condition of sepsis or septic shock. Consequently, V-LACT may be used in substitution for A-LACT particularly in lactate levels not higher than 4 mmol/l. However, trending should be generally applied instead of the absolute value.

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**Table 1 (abstract P176). Baseline characteristics in SS and ShS patients by quartiles of blood LT**

<table>
<thead>
<tr>
<th>Value</th>
<th>Lactate &lt;1.87 (n = 33)</th>
<th>Lactate 1.88 to 2.69 (n = 41)</th>
<th>Lactate 2.7 to 4.06 (n = 34)</th>
<th>Lactate &gt;4.07 (n = 37)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>57 (45 to 71)</td>
<td>64 (51.5 to 74.5)</td>
<td>65 (48 to 69)</td>
<td>60 (48.5 to 71)</td>
<td>NS</td>
</tr>
<tr>
<td>APACHE II</td>
<td>25 (18.5 to 30)</td>
<td>25 (19.5 to 27)</td>
<td>25 (21.5 to 29.5)</td>
<td>27 (22 to 33)</td>
<td>0.04</td>
</tr>
<tr>
<td>SOFA</td>
<td>9 (7 to 10.5)</td>
<td>9 (7 to 11)</td>
<td>9 (8 to 11)</td>
<td>11 (8 to 13)</td>
<td>0.024</td>
</tr>
<tr>
<td>NOF</td>
<td>3 (3 to 4)</td>
<td>3 (3 to 4)</td>
<td>4 (3 to 5)</td>
<td>5 (3.5 to 5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LT (mmol/l)</td>
<td>1.43 (1.16 to 1.56)</td>
<td>2.2 (1.99 to 2.47)</td>
<td>3.34 (3 to 3.72)</td>
<td>5.1 (4.4 to 7.34)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Procalcitonin (ng/ml)</td>
<td>2.81 (0.76 to 20.7)</td>
<td>11.5 (2.88 to 37.15)</td>
<td>13.47 (1.91 to 42.1)</td>
<td>21.6 (5.2 to 5.8)</td>
<td>0.05</td>
</tr>
<tr>
<td>Cholesterol (mg/dl)</td>
<td>127 (97.5 to 165)</td>
<td>130 (95.5 to 152.5)</td>
<td>100 (72 to 128)</td>
<td>91 (79 to 116.7)</td>
<td>0.06</td>
</tr>
<tr>
<td>28-day mortality (%)</td>
<td>10.8</td>
<td>21.2</td>
<td>24.4</td>
<td>35.1</td>
<td>0.029</td>
</tr>
<tr>
<td>ShS (%)</td>
<td>83.8</td>
<td>85.4</td>
<td>81.1</td>
<td>87.9</td>
<td>NS</td>
</tr>
</tbody>
</table>