159. Biomarkers and outcomes of community-acquired pneumonia

P1459

Does the serum C-reactive protein (CRP) predict adverse outcomes in patients admitted with community acquired pneumonia?

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BTS guidelines on management of community acquired pneumonia suggest that failure of c-reactive protein (CRP) to resolve by ≥50% during admission predicts complication1. We aimed to see whether a high admission CRP or non-resolving CRP predicted adverse outcome in bacterial pneumonia. We undertook a retrospective cohort study of adults (n=197) admitted to our hospital with bacterial pneumonia 2005-10. Age, length of stay (LOS), CRP on admission and subsequent CRPs were recorded from electronic patient data. We measured incidence of abscess, parapneumonic effusion, empyema, ITU admission and all-cause mortality within 30 days of admission, as adverse events. Incidence of adverse events within 30 days: abscess (0%); effusion (9.6%); empyema (5.2%); ITU admission (7.6%); death (12.2%). CRP≥300mg/L on admission increased probability of ITU admission (p=0.006;OR=6.5 (1.93-21.86)) but not effusion, empyema or all-cause mortality. However, CRP≥100mg/L on admission was not associated with increased probability of adverse event; although median LOS was 8 days (IQR 4-20), compared to 6 (IQR 2-12.5) for CRP<100. Failure of CRP to fall by ≥50% within ≥4 days of admission increased median LOS from 10 to 13 days, and increased probability of effusion (p=0.03;OR=5.83 (1.2-28.4)) and death (p=0.02;OR=4.82 (1.26-18.5)). Admission CRP≥100 and CRP≥300 are not reliable predictors of adverse outcome in our patients with pneumonia. In addition, failure of resolution of CRP by ≥50% at ≥4 days increases probability of effusion and death, but is not a reliable marker of empyema or ITU admission.

1BTS Community Acquired Pneumonia in Adults Guideline Group. Thorax 2009;64:s3(1-55).

P1460

Biomarkers as complication predictors in community-acquired pneumonia

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In order to determine if some marker that can help us to predict complications in patients admitted with community-acquired pneumonia (CAP), we prospectively included 228 patients and studied leukocyte count (WBC), C-reactive protein (CRP), procalcitonin (PCT) and midregional proadrenomedullin (MR-proADM) in the first 24 hours of their arrival.

One hundred and forty six (64%) patients suffered 310 significant complications within first 30 days after hospital admittance. Most frequent complications were: respiratory failure, pleural effusion, left cardiac failure, tachyarritmias, septic shock and mechanical ventilation. We found significant raised levels of MR-proADM (p<0.0001), PCT (p=0.001) and CRP (0.004) (Table 2) and in higher PSI (p<0.0001) and CURB65 (p<0.0001) scores, in patients with complications.

Complications	CRP (mg/L)	WBC (10^3/μL)	PCT (ng/mL)	MR-proADM (nmol/L)
NO	134.1 (55.4-236.2)	11.2 (7.6-16.4)	0.204 (0.06-2.35)	0.735 (0.433-0.939)
YES	190.3 (104.2-317.8)	12.4 (8.9-17.1)	0.954 (0.129-4.44)	0.994 (0.724-1.57)
p-value	**0.004**	0.341	**0.001**	**<0.0001**

Table 1. Biomarker levels in patients with and without complications

In ROC analysis the best AUCs were PSI 0.729 and MR-proADM 0.706. The optimal cut-off to predict complications for MR-proADM was 0.833 nmol/L, (sensitivity 67.35%, specificity 66.23%, positive likelihood ratio (LHR+) 1.99 and negative likelihood ratio (LHR-) 0.49. Findings for PSI class 4 and 5, were sensitivity 72.3%, specificity 62.34%, LHR+ 1.92 and LHR- 0.44. Similar results were obtained when we compared patients with and without only respiratory complications.

PCT and CRP, and especially MR-proADM and PSI score, appear to be useful in early identification of patients at risk for complications during hospitalization

P1461

Community acquired pneumonia (CAP) mortality and biomarkers

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We studied the accuracy of white blood count (WBC) and 3 biological markers, C Reactive Protein (CRP), Procalcitonin (PCT) and Proadrenomedulin (Pro-ADM) obtained in the admittance at Emergency Department, in predicting mortality of 224 patients hospitalized with Community Acquired Pneumonia (CAP).

Table 1 shows short (30 days), mid (90 and 180 days) and long term (1 year) mortality, as well as biomarker levels and their differences between deaths and survivors.

Mortality \ Biomarkers		CRP (mg/L)	WBC (10^3/µL)	PCT (ng/mL)	MR-proADM (nmol/L)
30-days n=224	Survivors n=211	156.4 (89.0-286.9)	11.85 (8.4-16.83)	0.41 (0.09-3.50)	0.856 (0.592-1.911)
	Deaths n=13	238.3 (123.4-332.5)	14.7 (6.5-17.8)	1.174 (0.477-6.69)	2.341 (1.188-4.226)
	p-value	0.262	0.914	0.123	**<0.0001**
90-days n=220	Survivors n=200	155.8 (89.1-287.3)	11.9 (8.4-16.6)	0.376 (0.09-3.53)	0.839 (0.578-1.158)
	Deaths n=20	228.9 (77.6-283.0)	10.5 (8.0-17.9)	1.024 (0.21-3.18)	1.731 (1.072-2.515)
	p-value	0.535	0.915	0.151	**<0.0001**
180-days n=218	Survivors n=192	155.6 (89.8-287.2)	11.75 (8.4-16.4)	0.373 (0.085-3.63)	0.838 (0.578-1.139)
	Deaths n=26	228.9 (91.1-287.4)	14.7 (8.2-18.7)	1.004 (0.13-2.94)	1.476 (1.056-2.43)
	p-value	0.391	0.519	0.158	**<0.0001**
1-year n=150	Survivors n=132	144.7 (71.7-253.0)	11.65 (8.3-16.4)	0.255 (0.076-4.41)	0.772 (0.50-1.03)
	Deaths n=18	251.9 (181.0-323.3)	16.1 (10.5-21.9)	1.134 (0.429-6.68)	1.238 (1.044-2.471)
	p-value	**0.030**	0.060	0.069	**<0.0001**

ROC analysis showed that AUC for MR-proADM was significantly higher compared to those of PCT, CRP and WBC, and without significant differences when compared with PSI and CURB65.

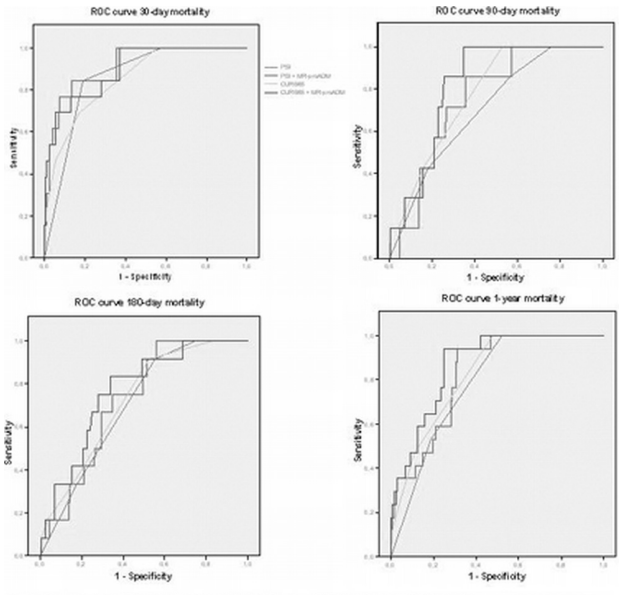

Figure 1. ROC curves for short, mid and long-term mortality comparing PSI/CURB65

Optimal cut-off to predict 30-day mortality for MR-proADM was 1.066 nmol/L. For 90 and 180-days mortality the optimal cut-off for MR-proADM was the same, 1.001 nml/L, and for 1-year mortality, 0.998 nmol/L

A logistic regression model combining MR-proADM levels with PSI score showed a significant increasing of discrimination power for CAP mortality when compared with PSI score alone.

MR-proADM is an accurate biomarker to early identification of patients with CAP that are going to die, and its outcome prediction increases those of PSI score.

P1462

Usefullness of CPR and PCT in the etiological diagnosis of community-acquired pneumonia

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Background: Biomarkers - C-reactive protein (CRP) and procalcitonin (PCT)- in community-acquired pneumonia (CAP) could be useful to distinguish bacterial or viral etiology.

Objective: To analyse initial levels of CRP and PCT in hospitalised CAP according to etiological diagnosis.

Material and method: Prospective observational study in 685 patients. The etiology of CAP was classified as bacterial, viral and atypical (*Mycoplasma, Coxiella* and *Chlamydophila*). We have calculated the cut-off points of PCT and CRP to differentiate bacterial or viral etiology and its diagnostic value through sensitivity (S), specificity (E), positive predictive value (PPV) and negative predictive value (NPV).

Results: An etiological diagnosis was reached in 295 (43%) patients: 203 (29.6%) bacterial - 118 *S pneumoniae* (51.1%) and 24 *Legionella* (11.8%)-, 12 (1.8%) virus and 24 (3.5%) atypical. The comparison between *Legionella* vs *S pneumoniae* with a cut off CRP≥22 and S:70%. E:59%. PPV:27%. NPV:90%; Atypical vs Bacteria with a threshold of PCT<0.5 and S:81%. E:68%. PPV:22%. NPV:97%; Virus vs Bacteria with a cut off PCT<0.5 and S:89%. E:68%. PPV:12%. NPV:99%.

Biomarkers and etiological diagnosis CAP

	Atypical vs Bacteria	Virus vs Bacteria	Virus vs Atypical	*Legionella* vs *S. pneumoniae*
CRP	11.3 vs 19, p=0.92	12 vs 19, p=0.67	12 vs 11.3, p=0.73	24.9 vs 19.9, p=0.009
PCT	0.19 vs 1.12, p=0.0001	0.24 vs 1.12, p=0.003	0.24 vs 0.19, p=0.73	0.7 vs 1.7, p=0.40

The results expressed in medians.

Conclusion: A threshold of PCT>0.5 rules out viral etiology with a very high negative predictive value. *Legionella* is associated with initial higher CRP. CRP and PCT do not allow to differentiate between viral or atypical etiology.

P1463

Lactate is an independent marker of severity in hospitalised patients with community-acquired pneumonia

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Background: Accurate severity assessment is important to guide initial management of patients with community-acquired pneumonia (CAP). Recognised severity scores may fail to recognise some high risk patients. Lactate is a powerful marker of sepsis but has not been studied in patients with CAP.

Methods: In a prospective study, arterial lactate was measured on admission in 855 patients with CAP. Recognised severity scores were calculated from admission data. The outcomes of interest were 30-day mortality and the need for mechanical ventilation or vasopressor support (MV/VS). The area under the receiver operator characteristic curve (AUC) and multivariable analysis adjusting for pneumonia severity were used to evaluate predictive markers.

Results: 30-day mortality increased with increasing arterial lactate level from 2.8% for lactate ≤2mmol/l, 17.9% for 2.1mmol/l-3.9mmol/l up to 30.8% in patients with lactate ≥ 4mmol/L (p<0.0001). Requirement for mechanical ventilation or vasopressor support increased with increasing lactate levels from 4.2% for lactate ≤2mmol/l, 15.6% for 2.1mmol/l-3.9mmol/l up to 36.4% in patients with lactate ≥ 4mmol/L (p<0.0001). Lactate had an AUC of 0.74 (0.71-0.77) for 30-day mortality which was lower than that for CURB65- AUC 0.77 (0.74-0.80) and PSI-0.81 (0.78-0.84). Lactate had an AUC of 0.73 (0.70-0.77) for MV/VS which was equivalent to CURB65 and PSI.

On multivariate logistic regression, arterial lactate was an independent marker predicting 30-day mortality-odds ratio 1.33 (1.19-1.49, p<0.0001), and MV/VS-odds ratio 1.49 (1.34-1.66, p<0.0001).

Conclusion: Lactate is an independent marker of severity in CAP predicting both 30-day mortality and requirement for MV/VS.

P1464

An unbalanced inflammatory response on admission impacts clinical stability in hospitalized patients with community-acquired pneumonia (CAP)

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Poor prognosis in CAP patients could be associated with an unbalanced inflam-

matory response in terms of pro- and anti-inflammatory cytokines relationship. The aim of our study was to evaluate the impact of the inflammatory response on admission and time to reach clinical stability (TCS) in hospitalized patients with CAP. An observational, prospective study was performed on consecutive patients hospitalised for CAP from April to December 2010 at the Respiratory Dpt., Policlinico Hospital, Milan, Italy. Cytokines were detected on blood samples collected within 24 hours from the admission with a high sensitivity immunoassay, and were classified as pro-inflammatory (IL6) and anti-inflammatory (IL4 and IL10). Gradients between the latter and the former were also calculated. Two groups of patients were identified: those who reached CS within 3 days from the admission (Group A) and the rest of population (Group B).
A total of 43 subjects were prospectively enrolled (26 males; mean±SD age: 71±18 yrs). Cytokine values are shown in Table according to the two study groups.

	Cytokine, pg/mL		p value
	Group A	Group B	
IL6	20.51±25.93	142.32±164.29	0.015
IL4/IL6	0.28±0.45	0.05±0.07	0.006
IL10/IL6	0.13±0.13	0.04±0.05	0.001

Negative correlations were found between IL10/IL6 ratio and TCS (r: -0.372, p=0.014), as well as IL4/IL6 ratio and TCS (r: -0.312, p=0.042).
An effective anti-inflammatory response seems to be a protective factor, whilst individuals showing unbalanced pro-inflammatory patterns take a longer time to recover. Further research is needed to assess the potential application of specific therapeutic agents in order to attenuate inflammatory damage.

P1465

Biomarkers and community acquired pneumonia (CAP) severity

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To check if any biomarker can be useful to assess Community Acquired Pneumonia (CAP) severity, we studied white blood cells count (WBC), and levels of C Reactive Protein (CRP), Procalcitonin (PCT) and Proadrenomedullin (MR-proADM), as well as PSI and CURB65 scores from 228 patients with CAP, within the first 24 hours of their admission in our hospital.
MR-proADM correlated better with both severity scores than other biomarkers, and was the only biomarker able to distinguish among all different risk classes of PSI score ($p<0.05$ for every of the two groups comparisons, see figure 1 and 2).
ROC analysis for discrimination between low risk (PSI 1-3) from high risk (PSI 4-5) CAP showed that MR-proADM had the best AUC (0.811). and could be considered a good predictor of CAP severity (see figure 1 and table 1).
Optimal cut-off of MR-proADM of 0.646 nmol/L showed a sensitivity of 92.1%, specificity 55.1%, positive predictive value 76.2%, and negative predictive value 80.3% for severe CAP.

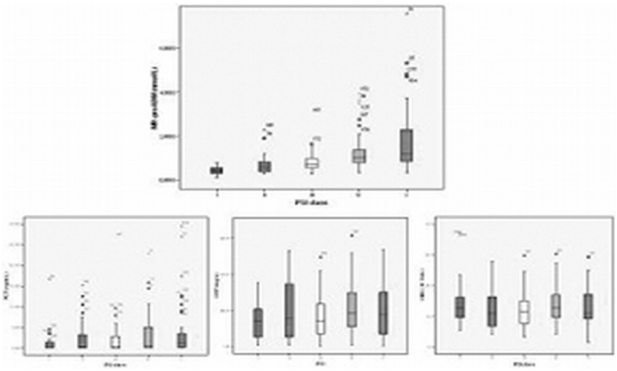

Figure 1. Distribution of MR-proADM, PCT, CPR and WBC by PSI classes.

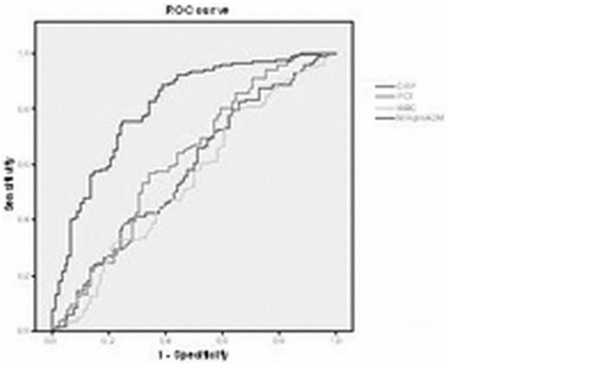

Figure 2. Power of biomarkers to discriminate between low risk (PSI 1-3) from high risk (PSI 4-5) CAP.

Table 1.

ROC curves	AUC	95% CI	p-value
CRP	0.588	0.511-0.665	**0.025**
PCT	0.620	0.542-0.697	**0.002**
WBC	0.552	0.474-0.631	0.183
MR-proADM	**0.811**	0.753-0.869	**<0.0001**

MR-proADM can be helpful, together with validated clinical scores, to identify CAP severity in the first hours of patient's management.

P1466

Biomarkers to discriminate bacterial, viral and mixed community acquired pneumonia (CAP)

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To find out if C Reactive Protein (CRP), Procalcitonin (PCT) and Proadrenomedullin (Pro-ADM) are able to discriminate different CAP etiologies, we collected biological samples from 228 patients admitted in our hospital with CAP in the first 24 hours. Average age: 73 years, 61% males. We performed a complete microbiological searching, and found at least one pathogen in 155 (67.98%) patients. Fifty seven were typical bacterial CAP, 57 viral or atypical and 41 were mixed (virus + bacteria).

Results:

- PCT was the only biomarker that showed significant differences ($p<0.0001$) between typical bacterial CAP (2.402 ng/mL) and viral/atypical bacterial CAP (0.272 ng/mL). Also, was the only biomarker that discriminated ($p=0.007$) viral pneumonia from mixed pneumonia (1.568 ng/mL).
- PCT and CRP levels in viral CAP showed significant differences ($p<0.0001$ and $p=0.046$ respectively) when compared to the other etiologies grouped together (typical bacterial + mixed).
- A PCT cut-off of 0.255 ng/mL identified typical bacterial involved CAP (bacterial and mixed) from viral/atypical ones, with a sensitivity of 74.23% and a specificity of 50%.

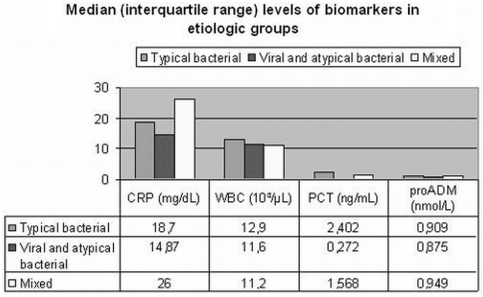

Figure 1. Biomarker levels according to etiologies.

Conclusion: CRP, and especially PCT, seem to be useful in early identification of typical bacteria-involved CAP, including those in association with viruses.

P1467

The ability of pro adrenomedullin to predict severe sepsis in patients with comunity-acquired pneumonia

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Objective: The aim of this study was to compare the ability that validated predictive rules (PSI and CURB65) and the new biomarker Pro adenomedullin (proADM), had to predict severe sepsis.
Methods: We prospectively included patients over 18 years old for a period of one year. PSI and CURB65 scores were estimated to all of them on admission. Blood samples were collected at the time of diagnosis to determine proADM

levels. Patients with septic shock were also included. The predictive accuracy of proADM, PSI or CURB65 to predict severe sepsis was determined by calculating the area under the ROC curve (AUC). AUC values were compared using the non-parametric method described by Hanley and NcNeil. Further, we also tested whether the inclusion of the biomarker improves the performance of the PSI or CURB65 risk scores by comparing the AUC values of the logistic regression models including the biomarker and PSI or CURB65 to the model including risk solely scores.
Results: A total of 615 patients with CAP were included in our study. 320 (52.03%) were hospitalized and 295 (47.97%) were not. A group of 232 patients had severe sepsis of whom 15 had septic shock. The AUC for proADM to predict severe sepsis was 0.85. The AUC for PSI score was 0.87 and the one for the CURB65 score was 0.86. Once proADM was added to the PSI score or to the CURB65 score, the AUC for predicting severe sepsis was 0.89. In both cases p value was <0.0001.
Conclusion: ProADM is an important parameter in the prediction of severe sepsis in patients with CAP. Indeed, adding this biomarker to validated predictive rules, improves the predictive accuracy for severe sepsis.

P1468
Pro-adrenomedullin, pro-atrial natriuretic peptide and procalcitonin levels at admission in patients with community-acquired pneumonia and its correlation with risk scores
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Objectives: To assess levels of MR-proADM, MR-proANP and PCT in patients with community acquired pneumonia (CAP) and to correlate admission levels with the following severity risk scores: PSI, CURB65 and severe CAP (SCAP) and prognosis.
Methods: Study population was 85 patients with diagnosis of pneumonia. Epidemiological, clinical, microbiological, analytical and radiological data were recorded. Plasma samples were collected at admission. Patients were stratified according to the PSI, CURB65 and SCAP. Complications were defined as need of ICU admission or death.
Results: MR-proANP and MR-proADM showed significant differences across PSI score (p=0.001 and p=0.001) whereas no statistical differences were found for PCT (p=0.152). Regarding CURB65, MR-proANP and MR-proADM levels increased according to CURB65 score points (p=0.001 and p=0.001), but not PCT (p=0.071). Higher levels of MR-proANP (p=0.002), proADM (p=0.001) and PCT (p=0.069) were found in patients with SCAP criteria. MR-proADM (p=0.001) and MR-proANP (p=0.015) showed statistical differences when grouping SCAP in five risk groups. Levels of PCT (p=0.053) and MR-proADM (p=0.001) were significantly higher in patients admitted to ICU. Levels of all biomarkers were higher in non-survivors in comparison to survivors, although no statistical differences were found.
Conclusions: Admission MR-proANP and MR-proADM levels correlate with pneumonia severity assessed by PSI, CURB65 and SCAP.
PCT levels correlate with new severity SCAP index.
Higher biomarkers levels can be useful for identifying patients with a poorer prognosis.

P1469
Inflammatory pattern in bacteriemic community-acquired pneumonia
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Background: The inflammatory response in community-acquired pneumonia (CAP) depends on the host response, causal microorganism and severity of infection.
Objective: To analyze in a prospective study the pattern of inflammatory cytokines and biomarkers PCT and CRP (procalcitonin and C-reactive protein) in bacteriemic CAP in hospitalized CAP patients.

Biomarkers and citokines in CAP

	Bacteriemic CAP	No bacteriemic	P value
CPR	23.3 (13.96–4.53)	16 (8.8–23.8)	0.002
PCT	3.39 (0.4–11.6)	0.5 (0.19–2.24)	0.000
IL6	173 (46–461.3)	95 (34–233)	0.012
IL8	5 (2–26)	10 (3–20)	0.775
IL10	1 (0.25–36.25)	5 (0–18)	0.188

*CPR: C-Protein reactive, PCT: Procalcitonin, IL: Interleukine.

Results: 685 patients were included: 40 of them with bacteremia. The medians of CRP, PCT, TNF and IL-6 were significantly higher in those with bacteriemia (Table 1). PCT ≥0.36 to predict positive blood cultures showed sensitivity (S) of 85%, specificity (E) 42% and negative predictive value (NPV) of 98% (ROC area 0.70). The threshold of IL-6 ≥ 150 for predicting bacteremic CAP showed: 60% sensitivity, 70% and 96% negative predictive value (ROC area 0.65).
Conclusions: Bacteriemic CAP is associated with higher inflammatory cytokine systemic. PCT showed the highest diagnostic value. A cutoff ≥0.36 has high sensitivity. Lower initial PCT levels rule out bacteriemic CAP with a high negative predictive value.

P1470
C-reactive protein (CRP) utility in severe community-acquired pneumonia (SCAP) prognosis
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Background: Among SCAP patients mortality is usually high, especially in those requiring invasive mechanical ventilation (IMV) or vasopressor support (VS).We aimed to assess CRP on admission and 8th day values association with mortality and adverse outcomes in SCAP patients requiring intensive care unit (ICU) admission.
Methods: 30 ICU patients with SCAP (CURB-65 class 3,4) were enrolled. Control group included 16 healthy volunteers. X-ray examination, CRP levels measurement were performed on admission and on day 8. The main endpoints were in-hospital outcomes (in-hospital mortality (IHM),duration of ICU stay (DICUS)), necessity of IMV and VS.
Results: CRP values correlated with CURB-65 score (r=0,8;p<0,05 and r=0,76;p<0,05 respectively) and were statistically different in CURB-65 class 3 and 4 patients (p<0,05).CRP levels were higher in non-survivors vs survivors [median] [311 vs 241mg/ml,p<0,05 respectively]on the 1st and 8th days [249 vs 89 mg/ml, p<0,05 respectively], revealed correlation with IHM (r=0,64; p<0,05 and r=0,6; p<0,05 respectively). Longer DICUS was associated with higher CRP values on admission (r=0,43; p<0,05). CRP on the 1st day correlated with necessity of VS and IMV (r=0,79; p<0,05 and r=0,63; p<0,05 respectively), their values appeared to be higher in patients requiring VS and IMV vs those who didn't need them [311 vs 244 mg/ml respectively, p<0,05]. Negative X-ray dynamics was associated with increased CRP levels on the 1st day (r=0,55; p<0,05).
Conclusions: Increased CRP values in SCAP patients requiring ICU admission are associated with disease severity, negative X-ray dynamics and could be used for identifying patients with high IHM risk, prediction of DICUS, necessity of VS and IMV.

P1471
Biomarkers in severe community-acquired pneumonia (SCAP) prognosis, complications and outcomes
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Background: Early prognostic assessement is crucial for SCAP patients management.We studied accuracy of C-reactive protein (CRP), ilnterleukin-2 (IL-2), interferon-γ (IFN-γ), free triiodthyronine (fT3), free tetraiodthyronine (fT4), thyroid stimulating hormone (TSH), total cortisol (TC) in predicting SCAP hospital mortality and disease severity, outcomes, complications, need for invasive mechanical ventilation (IMV) and vasopressor support (VS).
Methods: 30 ICU patients with SCAP CURB-65 class 3-5 were enrolled. Control group included 16 healthy subjects.X-ray examination,serum markers measurement were performed on the 1st day after admission.
Results: CAP severity was associated with enhanced CRP (r=0,8; p<0,05), IL-2 (r=0,64; p<0,05), TC (r=0,87; p=0,01), decreased fT3 (r= -0,75; p<0,05) values. Non-survivors revealed higher CRP,IL-2, TC, lower fT3, TSH levels vs those in survivors [median: 11 vs 241mg/ml, p<0,05], [138 vs 0,8 pg/ml, p=0,03], [1377 vs 865 nmol/l, p=0,03], [2,8 vs 4,6 pmol/l, p<0,05], [0,89 vs 2,6 mMU/l, p=0,03]. Necrotising pneumonia developed in patients with decreased IL-2, fT4 values (r=-0,6; p=0,04 and r=-0,48; p=0,03),pleural effusion - in those with enhanced IFN-γ levels (r=0,8; p=0,01). IL-2,CRP,TC values were higher in patients requiring VS [122 vs 19 pg/ml, p=0,04], [311 vs 232 mg/ml, p<0,05], [1377 vs 865 nmol/l, p=0,03]. Enhanced CRP, low fT3 levels were associated with IMV requirement (r=0,63; p<0,05 and r=-0,71; p<0,05). Duration of ICU stay correlated with TC, CRP values (r=0,89; p=0,01 and r=0,43; p=0,04),length of hospitalisation - with TSH, fT4 levels (r= 0,56; p=0,01 and r= -0,44; p=0,05).
Conclusions: CRP, thyroid hormone, TC, IL-2, IFN-γ can augment early prognostic assessment of SCAP pts.

P1472

Comparison of inflammatory response biomarkers to predict complications in hospitalized patients with community-acquired pneumonia

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Background: Recently, an extensive research has gone into identifying the predictive value of biomarkers for complications in community-acquired pneumonia (CAP).
Objective: The aim of this study was to evaluate the utility of inflammatory biomarkers measured on admission in hospitalized patients with CAP.
Methods: We prospectively included patients over 18 years old for a period of one year. Procalcitonin (PCT), C reactive protein (CRP) and Pro adrenomedullin (ProADM) were compared in predicting complications occurred in the follow-up of 30 days. Mortality, severe sepsis, ventilation and/or septic shock and ICU/IRCU admission were the complications analyzed. For the comparison of biomarkers, the nonparametric Wilcoxon test was used, whereas AUC was used to measure the predictive ability of each biomarker.
Results: A total of 320 patients with diagnosis of CAP were included in our study and samples for biomarkers could be extracted in 258 of them. Table 1 shows the results of the comparison of the biomarkers according to each outcome, and the AUC values. Biomarkers are described as median and interquartile range.

Outcomes	Biomarkers		
	PCT	CRP	ProADM
	Median (IQR)	Median (IQR)	Median (IQR)
Inhospital mortality			
Yes (n=25)	1.29 (0.19-4.31)	180.80 (93.80-325.30)	2.40 (1.92-5.52)
No (n=295)	0.43 (0.13-2.36)	186.80 (81-305.30)	1.29 (0.91-1.83)
p-value	0.139	0.995	<0.0001
AUC	0.54	0.51	0.82
30-days mortality			
Yes (n=44)	0.50 (0.19-1.83)	174 (97.30-263.30)	2.10 (1.68-3.27)
No (n=276)	0.43 (0.13-2.41)	193.60 (79.70-315.10)	1.27 (0.90-1.78)
p-value	0.563	0.858	<0.0001
AUC	0.50	0.50	0.75
ICU/IRCU			
Yes (n=55)	2.36 (0.87-9.81)	343.40 (177.40-440)	1.61 (1.14-3.06)
No (n=265)	0.30 (0.10-1.44)	157 (73.90-265.35)	1.29 (0.91-1.88)
p-value	<0.0001	<0.0001	0.015
AUC	0.75	0.69	0.62
Sepsis severe			
Yes (n=158)	0.49 (0.16-3)	175.70 (64-285.05)	1.69 (1.21-2.67)
No (n=162)	0.42 (0.12-2.10)	210.50 (97-318)	1.14 (0.81-1.55)
p-value	0.464	0.255	<0.0001
AUC	0.52	0.54	0.73
Ventilation/Shock			
Yes (n=16)	7.35 (2.96-20.06)	385.10 (201.80-420.45)	2.20 (1.26-7.01)
No (n=304)	0.41 (0.13-2.09)	178.30 (81-284.50)	1.32 (0.91-1.97)
p-value	0.0002	0.029	0.038
AUC	0.84	0.69	0.69

IQR: Interquartile range. ICU: Intensive Care Unit. IRCU: Intermediate Respiratory Care Unit

Conclusion: ProADM is a powerful tool for the prediction of mortality and other complications in hospitalized patients with CAP. In addition, we found that PCT has the greatest predictive value for complications such as ventilation/shock or ICU/IRCU admission.

P1473

Prognostic value of cortisol and adrenocorticotropic hormone (ACTH) in severe community-acquired pneumonia (SCAP) patients

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Background: Elevated serum total cortisol (TC) levels in critically-ill patients revealed association with severity of critical illness as well as risk of death.We aimed to evaluate adrenal function in SCAP patients requiring intensive care unit (ICU) admission and it's relationship with SCAP severity, outcomes (in-hospital mortality (IHM), duration of ICU stay (DICUS)), need for invasive mechanical ventilation (IMV) and vasopressor support (VS).
Methods: 30 ICU patients with SCAP CURB-65 class 3-5 were enrolled. Control group included 16 healthy volunteers. Serum basal TC and ACTH were measured on the 1st and 8th days.
Results: Increasing CAP severity was associated with increased TC values both on admission and day 8 (r=0,87; p=0,011 and r=0,88; p=0,019).Their levels revealed statistical difference in CURB-65 score classes (p=0,033 and p=0,048 respectively). TC on admission and day 8 values demonstrated significant correlation with IHM (r=0,86;p=0,011 and r=0,88; p=0,021 respectively) and were higher in non-survivors vs those in survivors [median:1377 vs 865 nmol/l, p=0,033 and 823 vs 387 nmol/l, p=0,049 respectively]. TC on admission levels correlated with need for VS (r=0,87, p=0,012) and showed higher concentrations in patients requiring VS [1377 vs 865 nmol/l, p=0,034].TC values on the 1st day were associated with DICUS (r=0,89; p=0,019).ACTH values on ICU admission appeared to be higher in patients requiring IMV [33,5 vs 11,4 ng/ml respectively], (r=0,72; p=0,047), but were not statistically different.
Conclusions: Elevated serum TC in SCAP is associated with disease severity and could identify SCAP patients at high risk of IHM, predict DICUS and VS requirement.

P1474

Interleukin-2 (IL-2) and interferon-γ(IF-γ) in idenitying severe community-acquired pneumonia (SCAP) clinical outcomes and complications

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Background: Exaggerated and protracted proinflammatory response is associated with poor prognostic implications in SCAP.We assessed the diagnostic value of IL-2 and IFN-γ in identifying SCAP in-hospital outcomes and complications.
Methods: 30 SCAP patients CURB-65 class 3,4 were enrolled. Control group included 16 comparable healthy volunteers. We performed X-ray examination, IL-2 and IFN-γ measurement within the first 24 hours after admission and on day 8. In-hospital mortality (IHM), need for vasopressor support (VS), SCAP complications (necrotising pneumonia (NP), pleural effusion (PE)) were analyzed.
Results: Increasing CAP severity was associated with increased IL-2 values on the 1st day (r=0,64; p<0,05).IL-2 on admission values correlated with IHM (r=0,67; p<0,05). Patients with poor clinical prognosis had higher Il-2 levels on the 1st day vs those who survived [median][138 vs 20,8 pg/ml, p<0,05 respectively]. IL-2 on admission correlated with need for VS (r=0,65; p<0,05) and revealed higher concentrations in patients requiring VS vs those with stable haemodynamics [122 vs 19pg/ml, p<0,05].Patients who developed NP showed lower IL-2 levels vs those without destructive lung changes [16 vs 26 pg/ml, p<0,05]. PE in SCAP patients correlated with enhanced IFN-γ levels on the 1st and 8th days (r=0,8; p=0,01 and r=0,69; p=0,02). Patients with PE demonstrated higher IFN-γ values [41 and 20 pg/ml, p<0,05] vs those without PE [6,3 and 3,8 pg/ml, p<0,05].
Conclusions: IL-2 on admission values are reliable for mortality risk stratification, prediction of need for VS and NP development, IFN-γ could be helpful in identifying PE complication in SCAP patients.

P1475

Thyroid hormones implication in severe community-acquired pneumonia (SCAP): Relationship with survival, outcomes and clinical complications

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Background: The low thyroid hormone levels in the absence of primary thyroid disease have proved to be predictive of outcomes and disease severity in critical illness. We aimed to assess thyroid function in SCAP patients requiring intensive care unit (ICU) admission and it's association with in-hospital outcomes, SCAP complications, need for invasive mechanical ventilation (IMV) and vasopressor support.
Methods: 40 ICU patients with SCAP CURB-65 class 3-5 were enrolled. Control group included 16 healthy subjects. X-ray examination, free triiodthyronine (fT3), free tetraiodthyronine (fT4), thyroid stimulating hormone (TSH) levels measurement were performed within the first 24 hours after admission.
Results: fT3 initial values decreased with increasing severity of CAP (r=-0,75; p=0,0007). fT3 and TSH levels were lower in non-survivors vs in survivors [median] [2,8 vs 4,6 pmol/l, p=0,008 and 0,89 vs 2,6 mMU/l, p=0,037] and revealed correlation with in-hospital mortality (IHM) (r= -0,67; p=0,003 and r= -0,54; p=0,031 respectively). Longer in-hospital stay was associated with higher TSH (r=0,56; p=0,017) and lower fT4 values on admission (r= -0,44; p=0,05). Necrotising pneumonia (NP) developed in patients with lower fT4 levels vs those without destructive lung changes [16,9 vs19,1 pmol/l, p=0,042]. fT3 correlated with need for IMV (r= -0,71; p=0,001) and was lower in patients requiring IMV [2,86 vs 4,8 pmol/l, p=0,005].
Conclusions:Thyroid hormone values in SCAP patients are reliable markers of diseases severity, high risk of IHM and NP development and can be helpful in identifying patients requiring IMV and predicting length of in-hospital stay.

P1476

Pro-adrenomedullin, procalcitonin and CRP levels to predict bacterial pneumonia in patients admitted to emergency room

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Objectives: To assess if MR-proADM, PCT and CRP levels can distinguish

bacterial pneumonia from other kind of lower respiratory tract infections (LRTI).
Methods: Patients with fever and respiratory symptoms that were admitted in emergency room (ER) and from whom blood cultures were drawn. After retrospective analysis, patients were classified as: pneumonia (n=85), chronic obstructive pulmonary disease (COPD) exacerbation (n=25) and bronchial infection (n=52). Four patients were admitted to ICU and 9 died.
Results: PCT showed significantly higher levels in pneumonia when comparing with COPD exacerbation (p=0.003) and bronchial infection (p=0.002). CRP only showed significantly higher levels when comparing pneumonia group vs bronchial infection (p=0.002). Finally, MR-proADM showed statistical higher levels when comparing pneumonia group with COPD exacerbation (p=0.014) and bronchial infection (p=0.006). PCT and MR-proADM showed significantly higher levels in cases of definite bacterial diagnosis in comparison to other cases (pneumonia of probable bacterial or unknown origin, COPD exacerbations and bronchial infections) (p=0.017 and p=0.004). PCT and MR-proADM are significantly higher in patients admitted to ICU (p=0.011 and p=0.001). Regarding mortality, no significant differences were found.
Conclusions: PCT and MR-proADM show significantly higher levels in pneumonia in comparison to other lower respiratory tract infections.
PCT and MR-proADM levels are increased in confirmed bacterial infections.
Biomarkers measurement can be helpful for the management of patients admitted in ER with clinical symptoms of respiratory tract infection.