Author Response 2

Dear Editor,

We thank both the reviewers for their careful study of our manuscript and for their remarks and recommendations.

Our response to Reviewer 1:

Reviewer: 1

Comments to the Author

I had previously reviewed the manuscript.

What is the difference between a purulent parapneumonic pleural effusion and an empyema? By definitition an effusion that is purulent (has pus) is an empyema by Light's textbook. How is empyema defined in the study?

Our response:

Yes, I agree with your opinion. The type of inflammatory response in purulent parapneumonic pleural effusion and empyema is the same – oxidative burst of neutrophils, i.e. purulent inflammation (with pus).

Every final diagnosis was made using the clinical condition of patients, the results of microbial investigation, an assessment of the response to antibiotic therapy and the RDG imaging. The investigation of the pleural effusions was only one part of complex diagnostics procedures. Diagnosis of all cases was established by very experienced physicians.

All patients of our study were diagnosed in accordance with these criteria:

Purulent pneumonia

Productive cough, fever accompanied by shaking chills, dyspnoea, sharp or stabbing chest pain, increased of breathing, high heart rate, low oxygen saturation, typical auscultatory finding (crackles, rhonchi , pleural rub, decreased breathing sounds in the case of fluidothorax), typical findings in chest radiograph, X-ray and CT scan, increased levels of the systemic inflammation parameters in the blood (leukocytosis, concentrations of C-reactive protein, procalcitonine etc.), turbid fluidothorax and possible finding of bacteria in pleural effusion.

Chest empyema

We primarily considered a progression of the presented infectious impairment of the pleural cavity and growing of the visceral pleura thickness and split pleura in the CT scan as the diagnostic signs.

What were the gold standards for each diagnostic category?

Our response:

Heart failure

Cardiac insufficiency in accordance with NYHA Classification, pulmonary oedema, dyspnoea during strain, audible signs of asthma cardiale (crackles), tiredness, symmetric oedema on the ankles, nocturia, ascites and transudative fluidothorax, engorged neck veins, cyanosis, displaced apex beat, cardiomegaly, tachycardia and arrhythmia, hepatosplenomegaly, oedema, muscular atrophy, typical changes in echocardiography (systolic or diastolic dysfunction), positive finding of the N-terminal probrain natriuretic peptide (NT-proBNP) in the serum (>125.0 ng/L) and good response to the specific therapy.

Systemic sepsis

Considerably increased levels of the systemic inflammation parameters in the blood (leukocytosis, elevated concentrations of C-reactive protein, procalcitonine etc.), increased heart rate, hypotension, increased respiratory rate, infection (except the pleural cavity), increased or decreased body temperature, changes in haemocoagulation (i.e. trombocytosis) and development of DIC, organ dysfunction symptoms, development of septic shock and multiple organ dysfunction syndrome.

Post-surgery without purulent complication

There was a typical transient production of the reactive pleural effusion with the signs of the cleanup reaction in the pleural cavity.

Post-surgery with purulent complication

Increased body temperature, increased levels of the systemic inflammation parameters in the blood (leukocytosis, elevations of C-reactive protein, procalcitonine etc.), positive auscultatory finding, typical chest ultrasonography findings, decrease of the chest X-ray or CT scan imaging transparency, significant growing of the pleural effusion production, persistent fluidothorax and its visible changes – higher viscosity and turbidity, possible finding of bacteria in the pleural effusion.

Describe the randomized sampling process

Our response:

We have collected data from all investigated patients and their pleural effusions for a few years. After the finish of the diagnostic process patients were assorted in accordance to the type of the pleural cavity impairment. In this study we only focused on causes with predominance of neutrophils in pleural effusions of patients with heart failure (33 samples), systemic sepsis (26 samples), after chest surgery without purulent complication (128), after chest surgery with purulent complication (69 samples), with bacterial pneumonia (96 samples) and chest empyema (283 samples).

I have added this text to the manuscript instead the former one (see Material and Methods) (red writing).

Our response to Reviewer 2:

Reviewer: 2

To the authors

TAR-20-017. Matuchova et al. Cytological-energy analysis of pleural effusions with predominance of neutrophils.

The authors have made revisions and provided explanations in line with the recommendations. These have been incorporated into the manuscript. However, the manuscript remains difficult to read owing to the poor English and grammar used.

Selected areas for consideration of correction are as follows:

Page 4, line 39: 'Subject of our interest….' should read 'The subject…'

Page 4, line 45: 'they can be found them' should read 'they can be found primarily'

Page 4, line 55: The sentence beginning with 'Our aim was to determine..' doesn't make sense. Do you mean to say 'identify' rather than 'determine'?

Page 11, line 32: The sentence beginning 'In this study…' should be re-written – do you mean that the immune reaction patterns are different?

Page 11, line 40: '…concentrations the KEB values allow us better assessment…' would read better as '…concentrations the KEB values allow better assessment…'

Page 11, line 42: '…glucose concentration in pleural effusion is directly dependent on current level in the organism' – Perhaps is better to be more specific about what organism you are referring to and where in the organism (e.g. are you referring to the plasma concentrations in humans?).

Our response:

We have corrected all text in accordance with recommendation (red writing).

Thank you very much.

Yours Sincerely,

Petr Kelbich et al.