Introduction:
High levels of some aromatic microbial metabolites (AMM) in serum are related to the severity and mortality of critically ill patients [1]. Several studies have discussed the imbalance and loss of the diversity of gut microbiota but there are practically no data on the gut microbial metabolites in critical conditions, only a little - in healthy people [2, 3]. The aim of this work is to analyze the connection between serum and fecal levels of AMM in ICU patients.

Methods:
13 simultaneously serum and fecal samples (SFS) from ICU patients with nosocomial pneumonia (group I), 21 SFS from ICU neurorehabilitation patients (group II) and 5 SFS from healthy people were taken for GC/MS analyses. The following AMM were measured: phenylpropionic (PhPA), phenyllactic (PhLA), p-hydroxybenzoic (p-HBA), p-hydroxyphenyllactic (p-HPhLA), p-hydroxyphenylacetic (HPhAA), p-hydroxyphenylpropionic (p-HPhPA) and homovanillic (HVA) acids. Data were presented as medians with interquartile range (IR, 25-75%) using STATISTICA 10.

Results:
The sum of the level of 4 most relevant metabolites (4AMM) - PhLA, p-HPhLA, p-HPhAA, and HVA - in serum samples from group I and group II were equal to 0.9 (0.6-9.6) μM and 0.7 (0.5-1.0) μM, respectively, and were higher than in healthy people – 0.4 (0.4-0.6) μM (p<0.05). We suppose the presence of the correlation of AMM profile in blood and intestine. Particularly, SFS of healthy people are characterized by the prevalence of PhPA; AMM are not detected in feces of non-survivors but only HVA dominates in their serum in the absence of other (Fig. 1).

Conclusion:
The AMM profiles in gut and serum are interrelated; AMM in serum probably reflect the violation and loss of biodiversity of the gut microbiota in critically ill patients.

References:
Comparison of the quality profiles of AMM in serum and feces

The AMM profiles in serum (a) and feces (b) from healthy people, group I - patients with nosocomial pneumonia (Ia - survivors, Ib - not survivors) and group II - ICU neurorehabilitation. The data are presented as the proportion of each acid among all AMM.

Comparison of the quality profiles of AMM in serum and feces