CALGRANULIN C & CALPROTECTIN
as biomarkers of severe bacterial infection

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BACKGROUND

Sepsis remains a severe healthcare problem, it remains primary cause of death from infection; mortality rate at intensive care units is approximately 30%[1]. Sepsis is a life threatening medical condition caused by infection. After recognition of infectious agents, immune cells release plenty of proinflammatory and antiinflammatory mediators such as cytokines, chemokines and other molecules. This excessive reaction leads to a dysregulation in immune response and cause extensive tissue and organ damage[2]. Aim of our study is to identify a panel of novel biomarkers to rapid diagnosis and estimation of sepsis course severity.

AIMS

- to desribe calgranulin C and calprotectin kinetics
- to evaluate novel biomarkers of bacterial infection
- to distinguish in site of infection

METHODS

- patients: sepsis (Sepsis-2 criteria)
  blood samples: day 1, 3, 5, 7
- 2 control groups: healthy donors
  patients with viral infection
- analysis: ELISA (Biovendor, CZ)

CONCLUSION

- possible biomarkers of bacterial infection
- correlation with clinical improvement
- no difference in site of infection
- limitation - small groups

RESULTS

Study groups

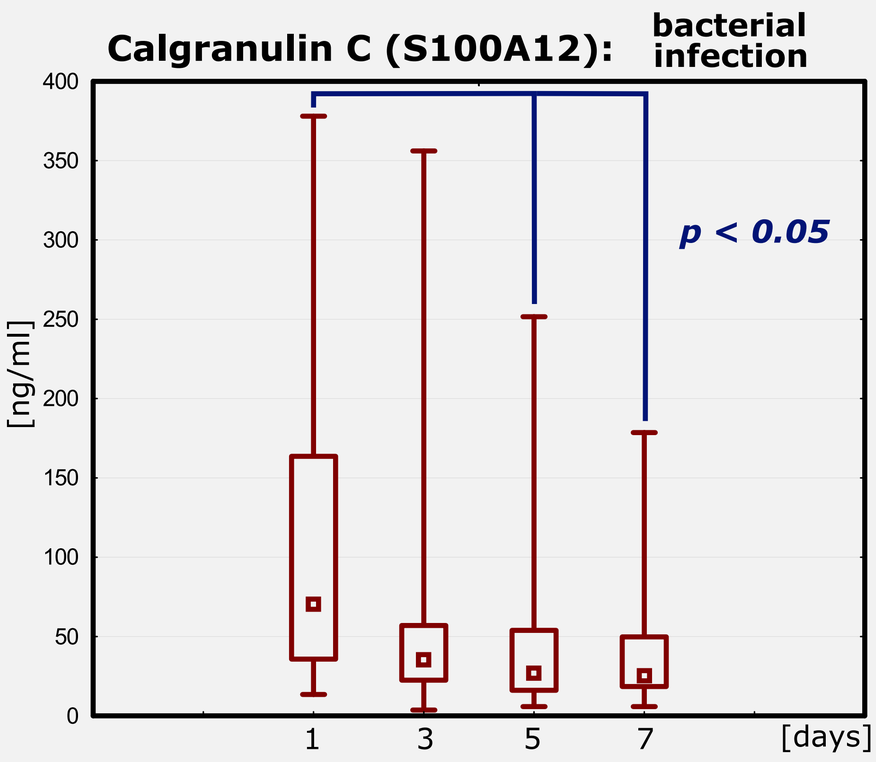
	n	male [%]	age [median; IQR]
bacterial infection	43	44,2	53 (27)
viral infection	15	60,0	31 (9)
controls	25	60,0	53 (17)

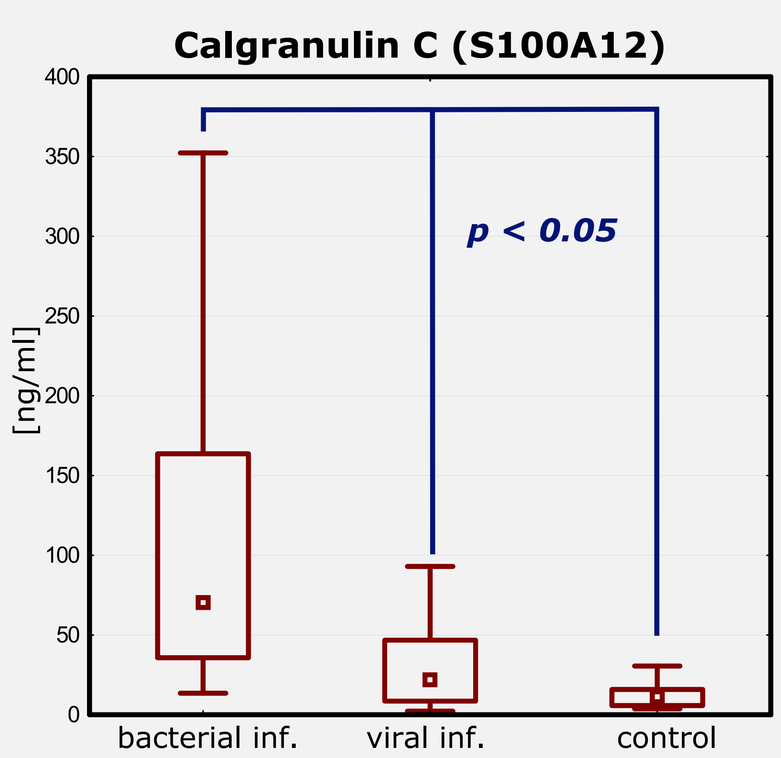
Site of bacterial infection [%]

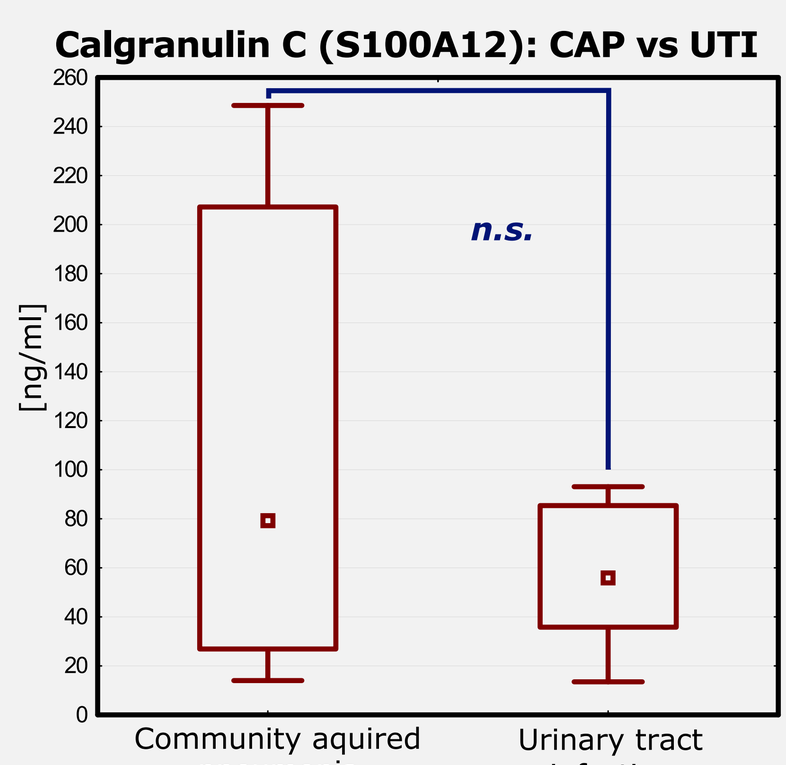
urogenital tract	n=18	[41,9]
respiratory tract	n=11	[25,6]
gastrointestinal tract	n=4	[9,3]
skin and soft tissue	n=3	[7,0]
others	n=7	[16,3]

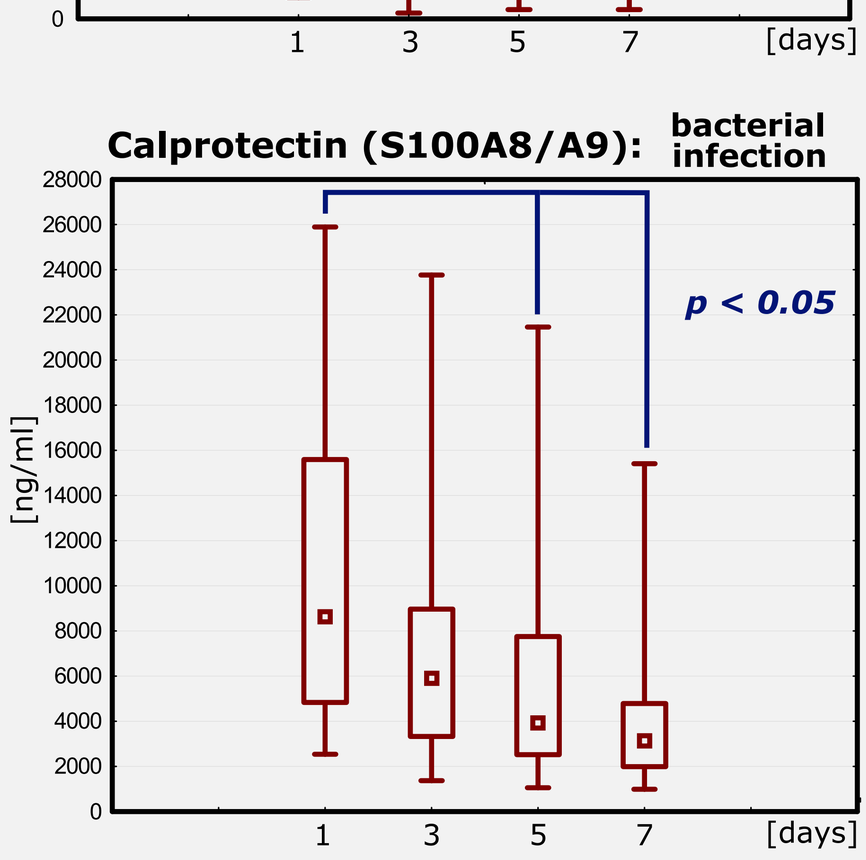
Etiology [%]

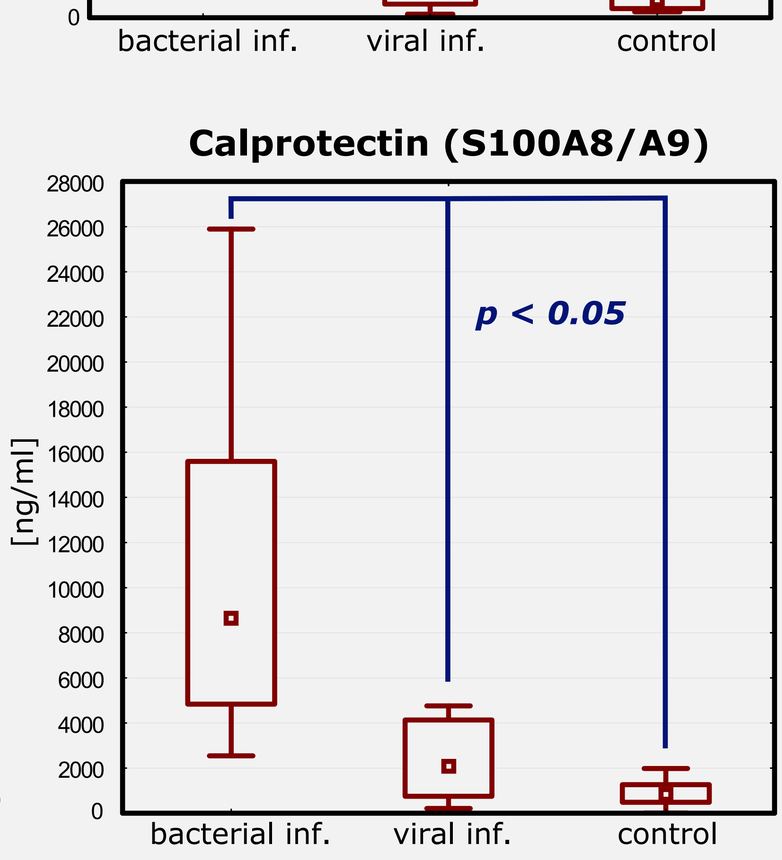
Escherichia coli	37,2
Staphylococcus aureus	7,0
Campylobacter jejuni	7,0
others	11,6
unknown	37,2

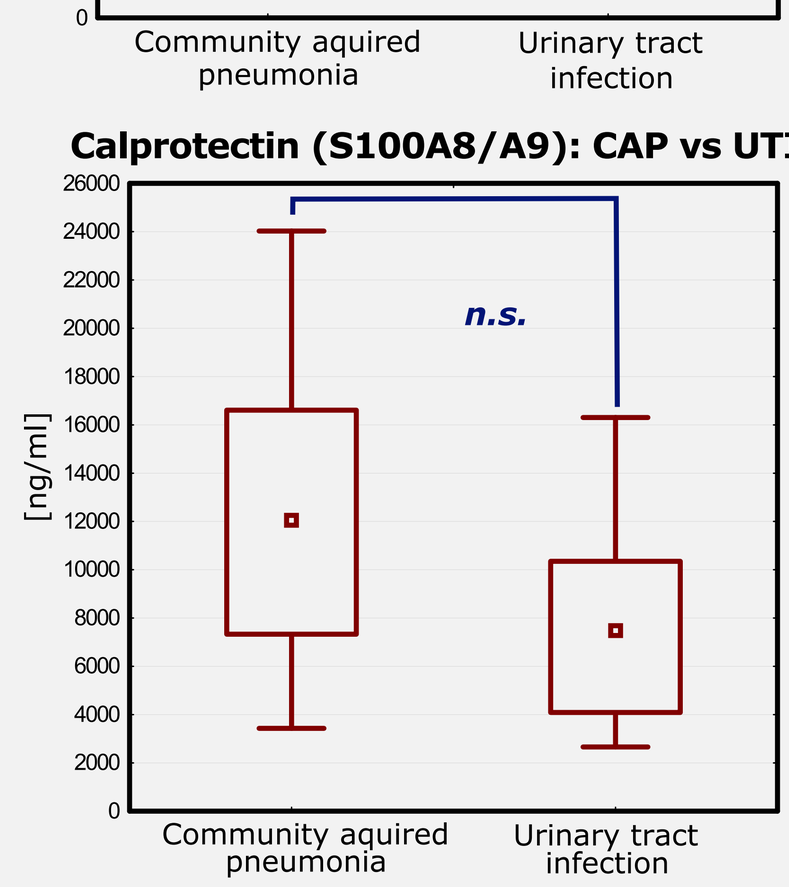












n.s.: non significant

CALGRANULIN C & CALPROTECTIN

Calgranulin C (S100A12) and calprotectin (S100A8/A9) are calcium binding proteins which belong to a group of Danger Associated Molecular Patterns called alarmins. These molecules are released after tissue damage caused by trauma or infection. Alarmins stimulates innate immune cells to produce cytokines. Calgranulin C and calprotectin are members of S100 protein family and they are mostly contained in epithelial cells and neutrophil granulocytes; calgranulin C and calprotectin represent almost 40% of cytosolic content in neutrophil granulocytes. Intracellularly they participate in calcium metabolism, cell proliferation and differentiation. Once released, they play a role in adhesion and migration of neutrophils, stimulate cytokine production and secretion in monocytes and endothelial cells. The antimicrobial and antiparasitic activity is also described. Calgranulin C bounds to receptor for advanced glycation endproducts (RAGE) and calprotectin uses toll-like receptor 4 (TLR4). The significant role of S100 proteins in case of sepsis, acute respiratory distress syndrome and asthma bronchiale is suggested. Some studies point to regenerative potential in wounds and in liver tissue reparation process[3].

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