

CALPROTECTIN AND CALGRANULIN C as Novel Biomarkers of Bacterial Infection

Bartáková E.¹, Blahutová M.², Beran O.¹, Arientová S.¹, Štefan M.¹, Holub M.¹



ÚVN

¹Department of Infectious Diseases, First Faculty of Medicine, Charles University and Military University Hospital Prague

²Department of Clinical Biochemistry, Military University Hospital Prague

INTRODUCTION

Calprotectin (S100A8/9 protein) and calgranulin C (S100A12 protein) are calcium-binding proteins belonging to a group of danger associated molecular patterns (DAMPs). These proteins are stored in human epithelial cells, keratinocytes, monocytes (Mo), and neutrophils; calprotectin comprises approximately 45% of neutrophil cytosol content. After neutrophil death or activation, calprotectin and calgranulin C are released to extracellular space. Elevated serum levels of calprotectin and calgranulin C were found in children with acute otitis media, and in adults with tuberculosis or septic shock. Although these studies indicate that calprotectin and calgranulin C can serve as biomarkers of infectious diseases, their serum levels have not been analyzed in adults with common infectious diseases.

AIMS

Calprotectin and calgranulin C:

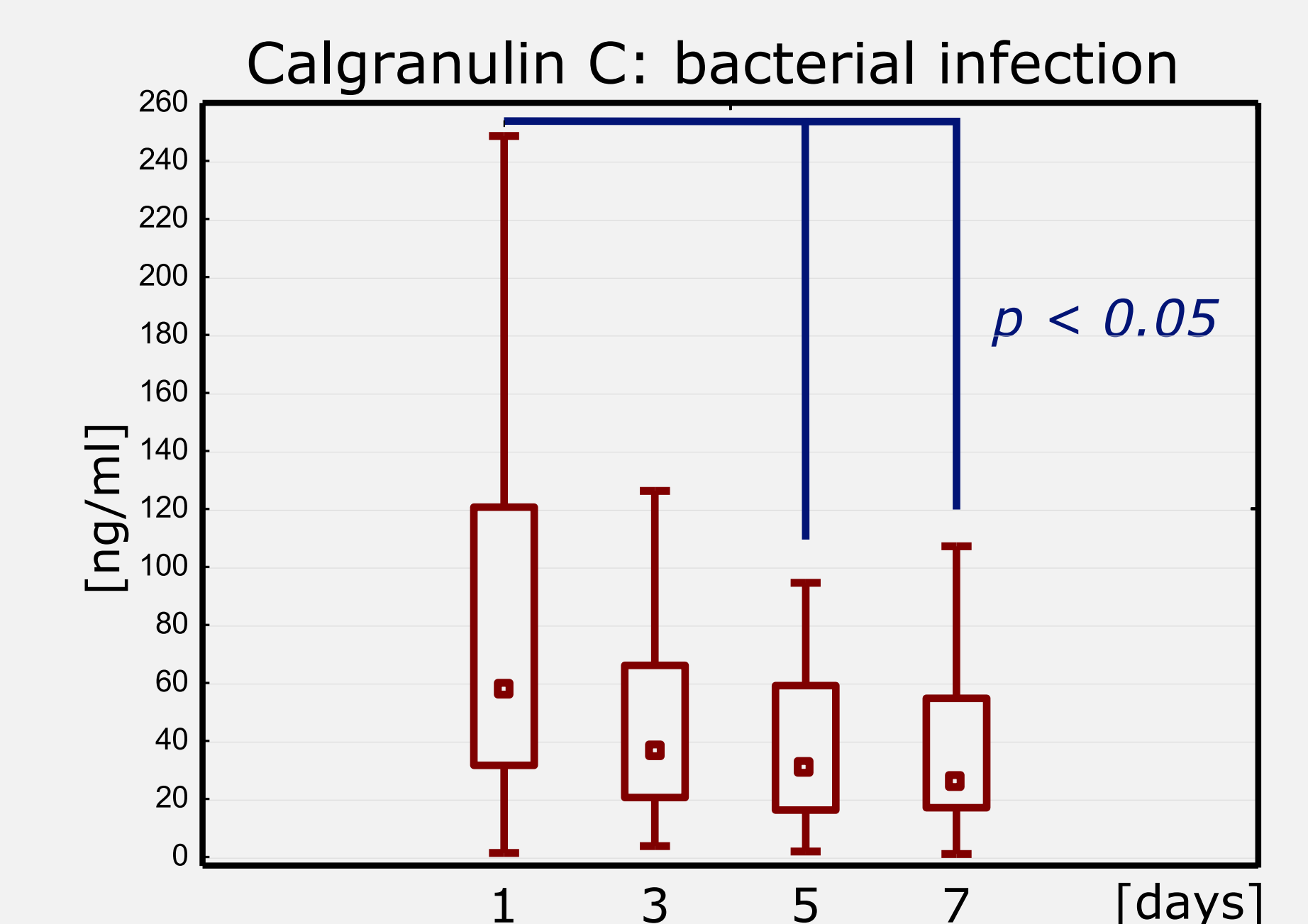
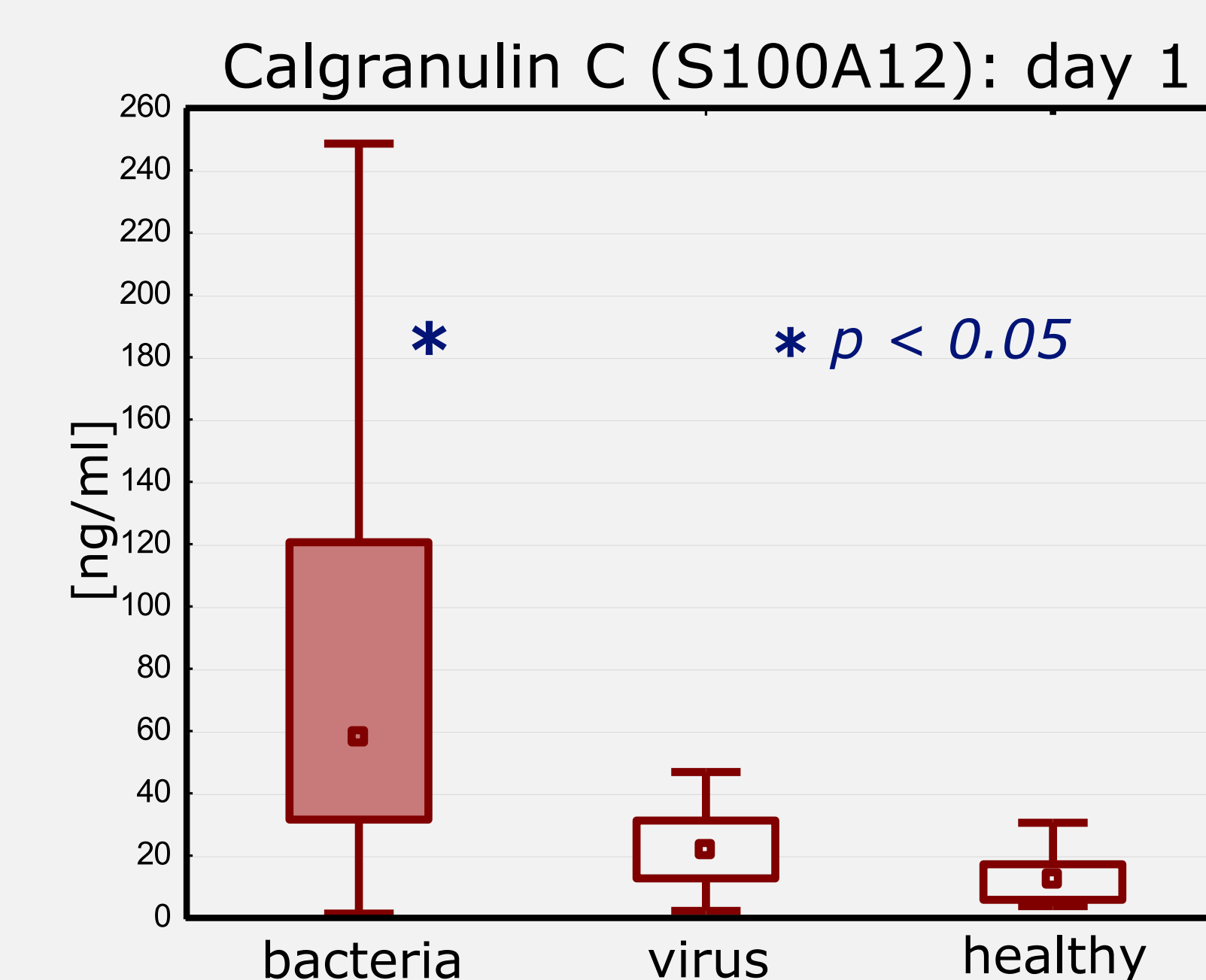
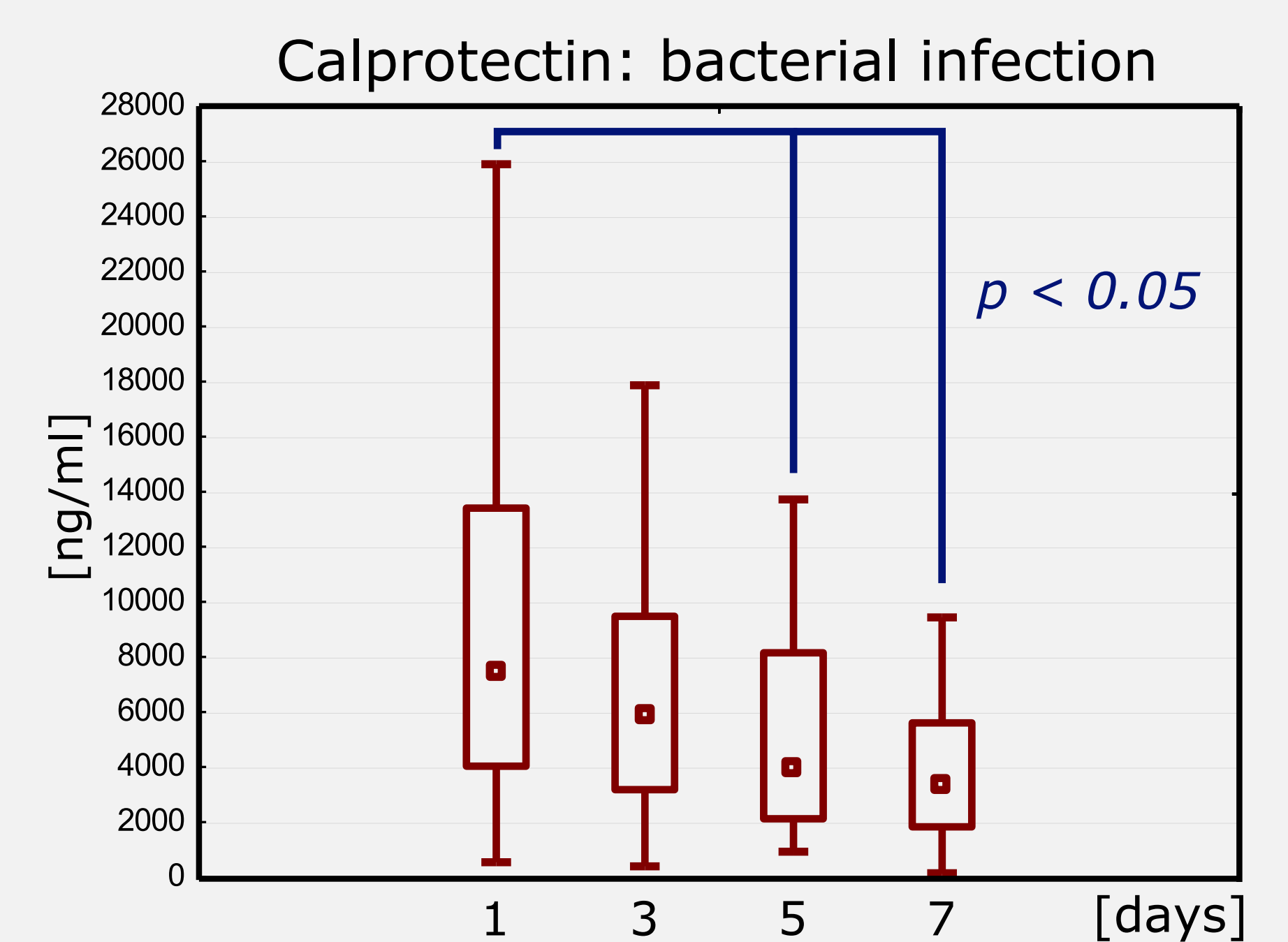
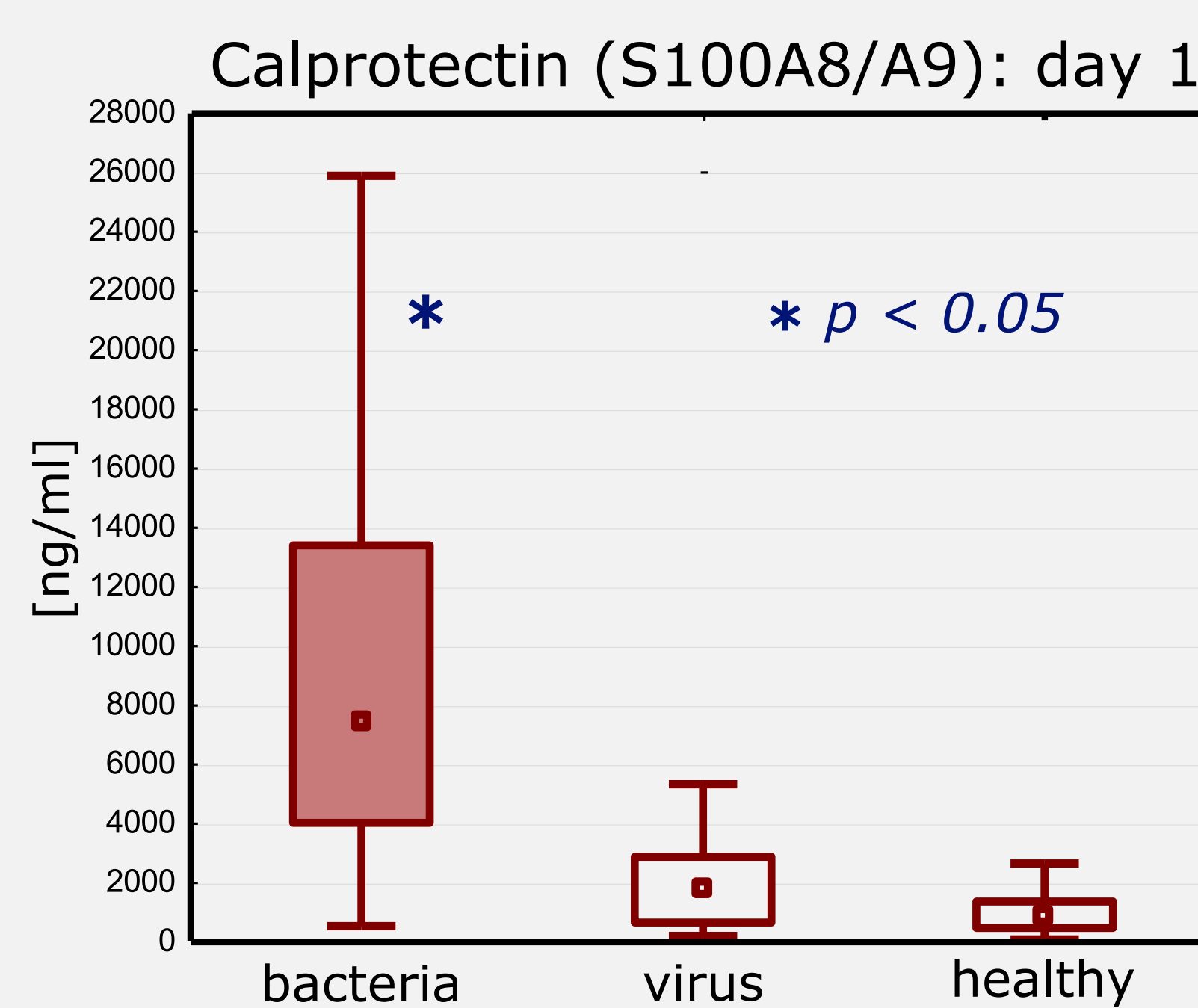
- serum levels in adults with community-acquired infections
- changes in the kinetics during clinical course
- effect of antibiotic therapy on the kinetics
- association with etiology and site of infection

METHODS

- adult patients (age range 18-80 years)
- severe bacterial or viral infection
- bacterial infection group patients met the Sepsis-1 criteria
- blood samples on day 1, 3, 5, and 7
- analysis: ELISA (Biovendor, Czech Republic)

RESULTS

Study groups	n	male [%]	age (mean ± SD)
Bacterial infection	66	51.5	52 ± 17.2
Viral infection	24	70.8	39 ± 18.5
Healthy controls	26	57.7	51 ± 12.6
Bacterial infection group characteristics			n = 66
Age in years, mean ± SD			52 ± 17.2
Sex, male			51.5%
Length of hospital stay in days, mean ± SD			9 ± 6.5
Etiology			
Gram-negative bacteria			34 (51.5%)
<i>Escherichia coli</i>			27
<i>Campylobacter jejuni</i>			3
Others			4
Gram-positive bacteria			10 (15.1%)
<i>Staphylococcus aureus</i>			4
<i>Streptococcus spp.</i>			5
<i>Clostridium difficile</i>			1
Non identified			21 (36.4%)
Site of infection			
Urogenital tract			30 (45.5%)
Respiratory tract			16 (24.2%)
Skin and soft tissue			9 (13.6%)
Gastrointestinal tract			4 (6.1%)
Other or non identified			7 (10.6%)
Positive blood culture result			15 (22.7%)



CONCLUSIONS

- significantly higher serum levels of calprotectin and calgranulin C in patients with bacterial infection
→ potential biomarkers of bacterial infection
- significant decrease during 7 days of antibiotic therapy
→ potential biomarkers for evaluation of the efficacy of antibiotic therapy
- no difference between Gram-positive and Gram-negative bacterial infection group
- serum levels of calprotectin and calgranulin C are not specific for the site of infection

REFERENCE

Chan JK, Roth J, Oppenheim JJ, et al. Alarmins: awaiting a clinical response. *The Journal of Clinical Investigation*. 2012;122(8):2711-2719.

ACKNOWLEDGEMENT

Supported by grants AZV 15-30186A and SVV 260369.

CONTACT

eva.bartakova@uvn.cz