

Low serum zonulin concentrations are associated with an unfavorable outcome in patients with sepsis

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Introduction

- Zonulin is a protein secreted by intestinal epithelial cells and is an index of intestinal permeability.
- Because of the limited number of studies evaluating blood zonulin levels in sepsis and the very small sample size (Klaus DA,2013), the significance of blood zonulin levels in sepsis remains unclear.
- The aim of this study was to investigate the relationship between blood zonulin concentrations and clinical characteristics and outcomes in patients with sepsis.

Methods

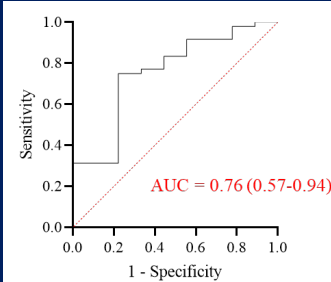
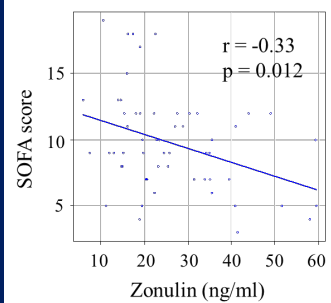
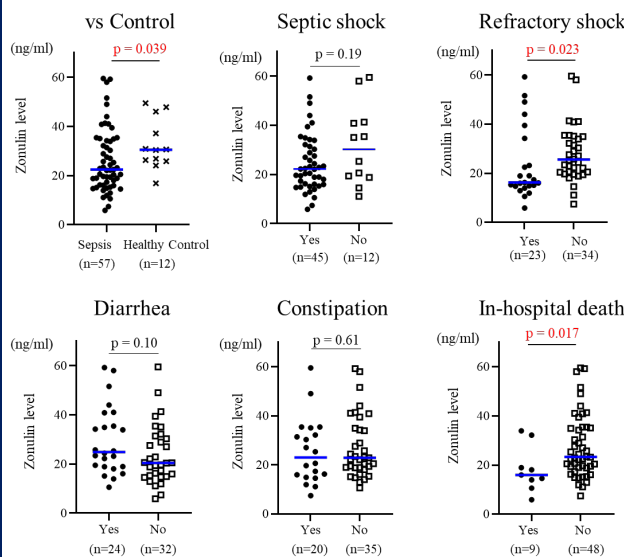
- Serum samples were prospectively collected from patients with sepsis admitted to the ICU of Hiroshima University Hospital within 24 hours after admission.
- Serum zonulin concentrations were measured using a commercially available ELISA kit (Immundiagnostik, Germany).
- Comparisons of continuous variables were performed with the Mann-Whitney U test. Spearman rank correlation coefficient was used for correlation analysis. To evaluate the predictive value of zonulin for in-hospital mortality, ROC analysis was performed and AUC was calculated.

Results

Patient characteristics

	Patients with sepsis (n=57)
Age	75 (67 - 80)
Sex (male), n (%)	38 (67)
BMI	22 (19 - 25)
SOFA score	9 (7 - 12)
C-reactive protein	18 (7 - 27)
Procalcitonin	9.8 (3.9 - 33)
Positive blood cultures, n (%)	34 (61)
Septic shock, n (%)	45 (79)
Refractory septic shock, n (%)	23 (40)
Infection focus, n (%)	
Lung	15 (26)
Abdomen	21 (37)
Urinary tract	8 (14)
Soft Tissue	7 (12)
Others/Unknown	6 (11)
Diarrhea, n (%)	24 (43)
Constipation, n (%)	20 (36)
Hospital mortality, n (%)	9 (16)

Relationship between clinical findings and serum zonulin concentrations



Refractory shock was defined as requiring multiple vasopressors, diarrhea was defined as three or more watery stools per day, and constipation was defined as not having a bowel movement for three or more days.

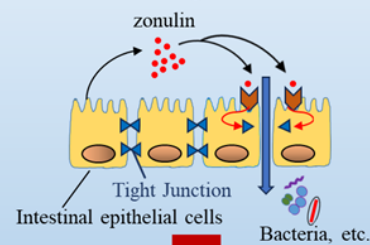
Discussion

- Zonulin is known to be elevated in patients with celiac disease and diabetes, and is considered an indicator of intestinal permeability because it acts on receptors in the intestinal epithelium and relaxes tight junctions.
- Low blood zonulin levels were associated with worsening of the disease condition in several diseases (Ohlsson L, 2019).
- In severe sepsis, severe damage to intestinal epithelial cells may result in impaired zonulin secretion and increased intestinal permeability simultaneously.
- Measurement of other markers of intestinal damage may prove this hypothesis.

Conclusion

Low serum zonulin concentrations were associated with an increased occurrence of refractory shock and of in-hospital mortality in sepsis.

Mild inflammatory condition



Severe sepsis

