Association Between Thromboinflammatory Biomarkers And Cellular Indices In Patients With End-Stage Renal Disease

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Introduction:

End-stage renal disease (ESRD) is often associated with chronic inflammation and hypercoagulable state. This results in the alteration of cellular indices (CI's) like neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), systemic immune-inflammation index (SII), lymphocyte-to-monocyte ratio (LMR), neutrophil-to-monocyte ratio (NMR). Thromboinflammatory biomarkers (TIB's), like D-Dimer (DD), Tissue Factor (TF), Ferritin, and C-Reactive Protein (CRP), have also been observed to be abnormal in ESRD patients. This study was designed to find a possible relevance between these CI's and TIB's.

Materials and Method:

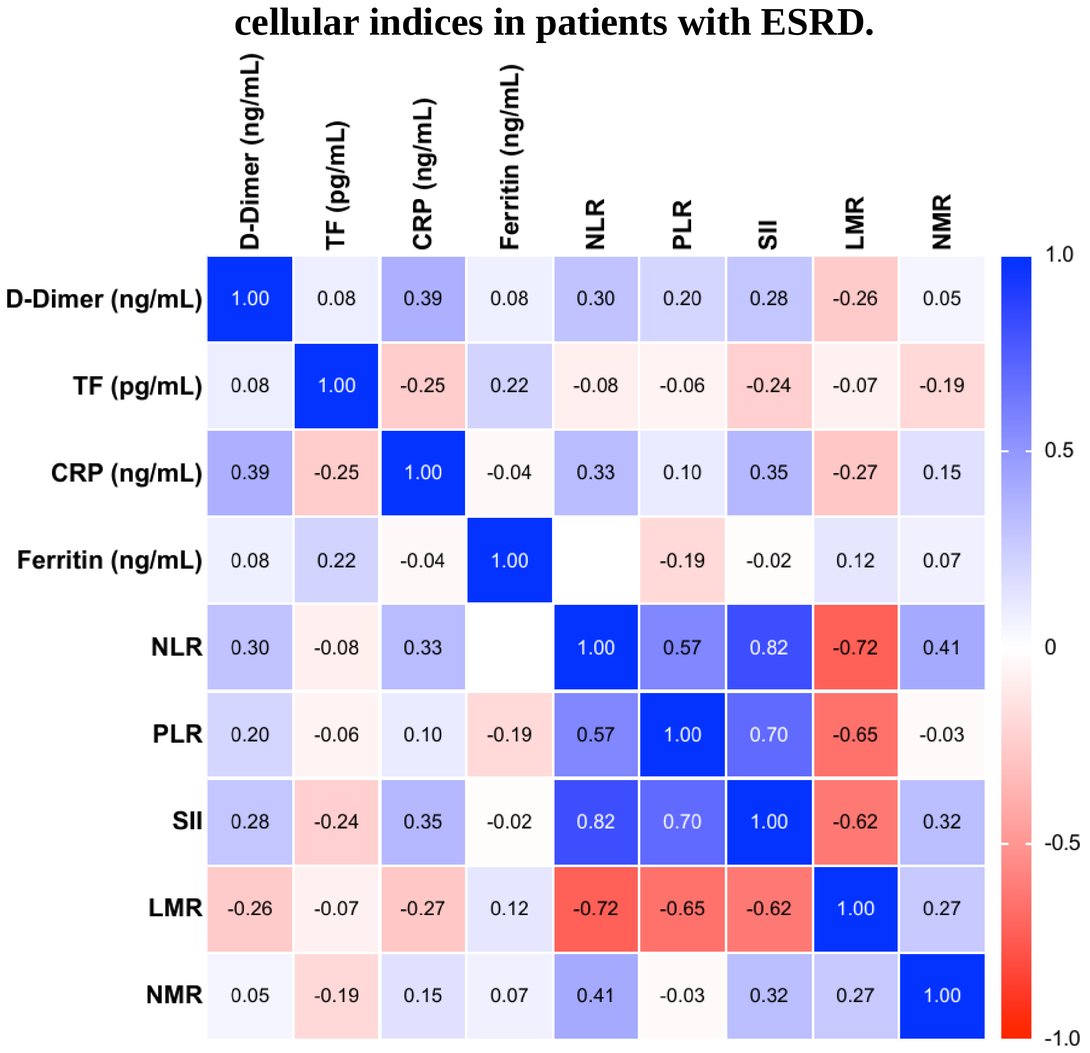
- 79 citrated plasma samples from patients with confirmed ESRD were collected in the Hemodialysis Clinic.
- Patient complete blood counts and ferritin levels were collected from chart review and blood performed, were calculated.
- Sandwich ELISA methods were used to determine DD, TF, and CRP concentrations.
- A correlation analysis was performed, and a correlation matrix was generated.

Results:

Figure 1 depicts the composite data.

- DD showed correlation with CRP along with NLR, PLR, SII and is inversely related to LMR.
- Interestingly, TF showed inverse relationship with CRP, SII, and NMR.
- CRP showed a relationship with DD, NLR, and SII where-asit showed inverse relationships between TF and LMR.
- Ferritin showed positive relationship with TF and inverse relationship with PLR.
- Among the CI's, varying degrees of strong correlation were observed.

Figure 1. Spearman correlation matrix illustrating the relationship between thromboinflammatory biomarkers and cellular indices in patients with ESRD.



Discussion:

Recently cellular indices, such as NLR, PLR, SII, LMR, and NMR have emerged as predictor of risk and outcome in ESRD. SII is also calculated for the immunoinflammatory process which are involved in the pathophysiologic process in the ESRD. This is the first study which have compared D-D, TF, CRP, and ferritin with the CI's to understand the mechanism involved in the mediator released or generated from the cells. Although, we have demonstrated the relevance of some of the CI's with biomarker generation. Additional studies are needed to understand the exact mechanism and crosstalk between cells and their regulation by inflammatory mediators. Our study has certain limitations and can be expanded in a larger cohort in multicenter studies. Additional biomarkers should be included such as markers of complement activation, and oxidative stress processes.

Conclusion:

This data demonstrates that there is a complex interdependence between the CI's and TIB's in the pathogenesis of ESRD. Furthermore, this study shows that an integrated profiling of CI's and TIB's may have a prognostic role which will be helpful in the management and risk stratification of this complex syndrome.

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