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# Correlation Between Serum Indoxyl Sulfate Level and Arterial Stiffness in Chronic Hemodialysis Patients: A Preliminary Study

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**Objectives:** Indoxyl sulfate is an uremic toxin associated with gut dysbiosis. Its concentration increases as the kidney function declines. Indoxyl sulfate causes endothelial cell dysfunction and increases vascular smooth muscle proliferation, leading to arterial stiffness. This contributes to the increased risk of cardiovascular events in hemodialysis patients. This study aims to assess the relationship between serum indoxyl sulfate concentration and arterial stiffness in patients undergoing chronic hemodialysis.

**Methods:** This is a cross-sectional study assessing the relationship between serum indoxyl sulfate concentration and arterial stiffness in patients undergoing chronic hemodialysis (five-hour session, two times a week) in Cipto Mangunkusumo General Hospital, Jakarta, Indonesia. Blood sample for serum indoxyl sulfate examination was collected prior to hemodialysis and analyzed using High Performance Liquid Chromatography. The gold standard for assessing arterial stiffness is the carotid-femoral pulse wave velocity (cfPWV) after hemodialysis process, where arterial stiffness is defined as cfPWV value of >10m/s. To assess the relationship between the two variables, we used Pearson correlation for normally-distributed data or Spearman for non-normally-distributed data.

**Results:** The study involved 35 chronic hemodialysis patients, with mean age of 52 years old. Forty-two-point-nine percent were male. Hypertension was observed in 28 patients and diabetes in 11 patients. The mean systolic and diastolic blood pressure were 140.3 mmHg (SD 26.28 mmHg) and 79.86 mmHg (SD 14.19 mmHg), respectively. Arterial stiffness was observed in 8 patients (22.85%) with median cfPWV value of 11.15 m/s (IQR 10.30-14.35 m/s). We found a median serum indoxyl sulfate concentration of 26.16 mg/L (IQR 20.41-34.61) and 25.14 mg/L (IQR 19.86-36.55) in the group with PWV of <10 mmHg and with PWV of >10 mmHg, respectively. Our analysis found no significant correlations between serum indoxyl sulfate concentration and arterial stiffness ($p=0.946$; $r=0.012$).

**Conclusions:** This study found no significant correlation between indoxyl sulfate concentration with arterial stiffness.