



Lecture Code : JS01-S3

Session Name : KSN-TSN-JSDT Joint Symposium

Session Topic : KSN-TSN-JSDT Joint Symposium

Date & Time, Place : June 12 (Fri) / 08:30-10:10 / Auditorium, 3F

Dialyzer Selection and Its Clinical Implications

Jeong-Hoon Lim

Kyungpook National University Medical Center, Republic of Korea

Hemodialysis adequacy has traditionally been assessed using small solute clearance metrics such as Kt/V. However, despite achieving adequate urea removal, patients on maintenance hemodialysis continue to experience high morbidity and mortality, highlighting the limitations of conventional dialysis strategies in addressing the broader spectrum of uremic toxins. In particular, middle molecules and protein-bound uremic toxins, as well as chronic inflammation, remain insufficiently controlled with standard high-flux membranes. Recent advances in dialyzer technology have introduced novel approaches that extend beyond conventional diffusion-based clearance. Medium cut-off (MCO) dialyzers, used in expanded hemodialysis (HDx), enhance the removal of larger middle molecules through a size-selective permeability profile and internal filtration, offering a practical alternative to online hemodiafiltration without the need for substitution fluid. In contrast, polymethylmethacrylate (PMMA) dialyzers utilize adsorption-based mechanisms to remove inflammatory mediators, cytokines, and protein-bound toxins, thereby exerting potential immunomodulatory effects. These two strategies, enhanced permeability and adsorption, represent fundamentally different but complementary approaches to toxin removal. Emerging clinical evidence suggests that MCO dialyzers may improve middle molecule clearance and alleviate uremic symptoms, while PMMA dialyzers have shown particular benefit in reducing pruritus and inflammatory burden. Nevertheless, robust data demonstrating improvements in hard clinical outcomes remain limited for both modalities. This presentation aims to review the underlying mechanisms, clinical evidence, and practical considerations of MCO and PMMA dialyzers, and to propose a conceptual framework for personalized dialyzer selection based on the dominant uremic phenotype. Moving beyond a one-size-fits-all approach, optimizing membrane

selection may be a key step toward more individualized, biologically targeted dialysis therapy.

Keywords: Hemodialysis, Dialyzer selection, Medium cut-off membrane (MCO), Polymethylmethacrylate (PMMA), Uremic toxins