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Improving Symptoms of Elderly CKD Patients Using the "Bio-friendly" membrane

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Introduction The main concept of medicine in the 21th century is the patient-centeredness, then we should evaluate the QOL of dialysis patients and set up the daily practice pattern based on the patient-reported outcomes (PRO). We should pay more attention to those of elderly dialysis patients because they are frequently accompanied with malnutrition and sarcopenia. They have to continue dialysis because they have less opportunities for renal transplantation and their lifespans are shorter. In recent decades, a lot of types of dialysis filters have been used for high-flux hemodialysis (HD) or online hemodiafiltration (HDF). However, what types of dialysis are favorable for each dialysis patient has not yet confirmed. Evaluation of the membrane performance and the dialysis quality The performance of dialysis membrane has been evaluated by two essential points; the solute removal property and the biocompatibility of the membrane. On the other hand, the quality of dialysis therapy should be evaluated by clinical outcomes such as survival rate and quality of life. There is a bit of gap between evaluating membrane performance and clinical performance since high efficiency membrane does not always lead to a better clinical outcome. There have been a few studies that evaluated the relationship between membrane performance; solute removal property or biocompatibility and clinical outcomes. Solute remove property of dialysis membrane in HD/HDF High-flux HD/HDF were developed to intensively remove MMs such as beta-2 microglobulin which is the precursor of dialysis related amyloid fibril. Recently dialysis modalities that can aggressively remove larger MMs than beta-2 microglobulin were introduced, and these modalities were so-called “protein permeable dialysis”. Predilution online hemodiafiltration, protein adsorption hemodialysis and expanded hemodialysis are included in this category. Biocompatibility of dialysis membrane In high-flux, high-convective therapies, membrane materials must be strong enough to resist high trans-membrane pressures due to high convection volumes. Membrane materials that meet these requirements are synthetic

membranes such as polysulfone, polyether sulfone. In recent years, it has been reported that some of the chemical components of these membranes such as polyvinyl pyrrolidone and bisphenol A can adversely affect the quality of dialysis therapy. Polymethylmethacrylate and cellulose triacetate doesn't contain both chemicals. Clinical advantages of "Bio-friendly membrane" We have reported some of dialysis modalities such as pre-dilution HDF, protein adsorptive membrane and non-PVP non-BPA membrane, had favorable clinical effects. They improved the nutritional status and ameliorated dialysis related symptoms of elderly dialysis patients. We could call these favorable dialysis modalities "Bio-friendly membrane" or "Bio-friendly dialysis". Based on our 20-year experience of the patient-centered dialysis care, on-line HDF with high volume substitution could not always improve the nutritional status and symptoms of elder dialysis patients. Summary To improve the quality of life and survival of dialysis patients, it is necessary to establish a daily practice pattern based on PRO. In addition, it is necessary to provide "Bio-friendly dialysis" to each individual patient especially to elderly patients.

Keywords: patient-reported outcome, solute removal property, biocompatibility, bio-friedly membrane, elderly dialysis patient