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HDx, designed to be different for improving patient outcomes

Sang Heon Song
Pusan National University Hospital, Korea, Republic of

Hemodialysis membranes have evolved to be more biocompatible with fewer side effects and effectively remove the uremic toxins since development by Willem Kolff and Nils Alwall in the 1940s. Recently, nephrologists are focusing their attention on the effective elimination and management of middle molecules and protein-bound compounds among uremic toxins. In fact, the removal of protein-bound uremic toxins is not difficult to achieve the goal, but the removal of larger middle molecular uremic toxins may be possible by the adjustment of the pore size of hemodialysis membrane. In general, the larger the pore size, the better the removal of the larger molecular sized uremic toxin. Beyond conventional dialysis membrane, high cut-off (HCO) membrane has been developed so that the large uremic toxin was effectively removed by large sized pores, but at the same time, the loss of essential protein such as albumin was occurred. Therefore, more selective membrane with high permeable characteristics was needed to effectively remove the larger middle molecular uremic toxin and preserve the essential protein in the body by hemodialysis procedure. For this, membranes with larger pores and higher selectivity to optimize middle molecule removal have been needed. With the development of technology, unlike previous phase inversion method, the spinning technology has made it possible to produce dialysis membrane that meets these conditions. Since the late 2010s, expanded hemodialysis (HDx) has been proposed to effectively remove the larger middle molecules using medium cut-off (MCO) dialyzer than high flux dialyzer. This newest membrane is known to be suitable for removing the larger middle molecules with up to 45 kDa size without albumin loss.
This lecture will be focused to provide you more information about HDx treatment through the results of recent studies. Furthermore, I would like to share information on the ongoing clinical research by HDx and have time to think about whether HDx can improve the outcomes of the patients.