

無所不在的毒素—何去何從

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Uremic syndrome is characterized by retention of toxic metabolites which is caused by loss of renal function. Unlike the retention solutes, uremic toxins are biologically or biochemically active and affect almost every organ system. Until now, nearly one hundred kinds of compounds have been identified. They are subdivided into three major classes based on the removal pattern during dialysis: the small water-soluble compound, the larger middle molecules and the protein-bound uremic toxins. Despite of the subgrouping, generation of different classes of uremic toxins is interlinked. Except for the small water-soluble molecules, the other two classes of uremic toxins are difficult to be removed by conventional dialysis modality. Adding on convection to diffusion or applying membranes with larger pore size improves the clearance of middle molecules and is likely to be associated with a better outcome. However, these modalities provide only limited clearance for the protein-bound toxins. There is growing evidence showing that these non-dialyzable uremic toxins may contribute to inflammation and increased oxidative stress. The accumulation of these toxins further results in a variety of residual syndrome in uremia patients, especially the vascular complication. Alternative removal strategies, such as intestinal adsorption, change of kinetic behavior during dialysis, alternation of intestinal microbial environment have been investigated. More intense clinical trials are needed to demonstrate the clinical advantages of these strategies in the future.