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Reduced hemodialysis-induced oxidative stress in end-stage renal disease patients by electrolyzed reduced water

Electrolyzed reduced water (ERW) obtained by electrolysis scavenges ROS and Protects DNA from oxidative scavenges ROS and protects DNA from oxidative Damage. The protective mechanism of ERW results from active atomic hydrogen with high reducing ability, which can contribute to ROS scavenging activity, and may participate in the redox regulation of cellular function. Hemodialysis Produces ROS in blood during dialysis and imposes heavy burden on patients; therefore, for decreases of hemodialysis-enhanced oxidative stress, we have considered administering ERW by a new setup of HD-24k

(Nihon Trim Co., Osaka, Japan) to the patients during hemodialysis course. Three months of hemodialysis session were used in this study as in vivo system to evaluate the effect of ERW on dialysis-induced oxidative stress. We clarified the response of H₂O₂/HOCl system and to identify which ROS is scavenged by hemodialysis session with ERW administration. We used a characteristic emission spectrum analysis of the chemiluminescence (CL) Spectrum for the first time to evaluate the specific ROS activity, including H₂O₂ and HOCl in the plasma and adapted a CL high-performance liquid chromatography (CL-HPLC) for measurement of PCOOH before and after the dialysis session, in the absence and presence of ERW. Our study showed that ERW administration partially restored ROS scavenging activity for H₂O₂ and HOCl. This treatment also resulted in lower plasma levels of oxidized lipids and proteins, and inflammatory markers in ESRD patients as compared to those before ERW treatment. Dialysate with simultaneous ERW replacement might be of clinical importance for preventing oxidative stress induced cardiovascular events in ESRD patients undergoing chronic hemodialysis.

Related Information

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