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Comparison of Long-Term Outcomes and Complications Between Hemodialysis and Peritoneal Dialysis

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Objectives : End-stage renal disease (ESRD) patients require dialysis to sustain life, with two primary options: hemodialysis (HD) and peritoneal dialysis (PD). These modalities differ in survival rates, complications, and quality of life, making it essential to compare their long-term effects for optimal treatment decisions.
Methods : This study analyzes data from the United States Renal Data System (USRDS) and the European Renal Association (ERA-EDTA), covering over 50,000 ESRD patients observed for 5-10 years. Key evaluation metrics include: 1. 5-year and 10-year survival rates 2. Incidence of major complications (e.g., cardiovascular disease and infections) 3. Quality of life assessment (KDQOL-SF questionnaire) 4. Dialysis-related healthcare costs
Results : 1. Survival Rates． PD patients show higher survival in the first 1-2 years, but HD has better long-term survival. USRDS data indicate 5-year survival rates of 48% (PD) vs. 52% (HD) and 10-year rates of 22% vs. 25%. 2. Cardiovascular and Infection Risks． HD patients leading to a 12-15% annual risk of cardiovascular events. It is main complication is catheter-related infections, with a 5-10% annual incidence.． PD patients face risks of hyperglycemia and lipid metabolism disorders due to glucose-based dialysate, increasing atherosclerosis risk. It is primary complication is peritonitis, occurring at 0.5-1.0 episodes per year per patient. 3. Quality of Life and Costs． PD offers greater independence and quality of life.． HD requires regular hospital visits but ensures better medical supervision.
Conclusions : Both HD and PD have advantages, and treatment choice should consider patient age, comorbidities, lifestyle, and financial factors. PD is preferable for younger, independent patients, while HD is more suitable for older individuals requiring close medical monitoring. Future advancements in personalized treatment and technology may further enhance dialysis outcomes.