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Preserving Peritoneal Dialysis in Acute Coronary Syndromes with Pulmonary Edema: Clinical Evidence and Practice Tips

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INTRODUCTION

Managing Acute Coronary Syndrome (ACS) complicated by pulmonary edema in patients with End-Stage Renal Disease (ESRD) on dialysis is particularly challenging, requiring a balance between effective decongestion and hemodynamic stability. Traditionally, Hemodialysis (HD) is considered first line because it removes fluid rapidly; however, aggressive ultrafiltration during HD often precipitates intradialytic hypotension and arrhythmia, potentially worsening myocardial ischemia [1]. In contrast, Peritoneal Dialysis (PD) provides gradual, continuous ultrafiltration and avoids abrupt intravascular volume shifts. In heart-failure populations, PD-compared with HD-has been associated with fewer blood pressure fluctuations and a lower incidence of intradialytic hypotension [2-4]. Despite these advantages, in daily practice we frequently encounter skepticism from intensivists and cardiologists, who doubt PD's ability to achieve adequate decongestion in ACS-related pulmonary edema and therefore recommend switching to HD.

ABOUT THE STUDY

We conducted a single-center retrospective analysis including 13 ESRD patients on long-term PD who experienced 15 episodes of ACS with pulmonary edema (Killip class II or higher) [5]. Most events were Killip class III, indicating marked volume overload. Of the 15 episodes, 11 (73.3%) were successfully managed with PD alone, whereas 4 required temporary HD due to insufficient ultrafiltration. Several patients who received

temporary HD resumed PD within days after stabilization. Overall, these data indicate that, in most ACS episodes with pulmonary edema, PD can be continued without conversion to HD when the prescription is individualized and optimized-e.g., higher dextrose concentrations, addition of icodextrin for sustained ultrafiltration, shorter dwell times, and increased exchange frequency.

Clinical implications

Our findings suggest that PD remains a viable therapeutic option during acute cardiac events. Its gentler ultrafiltration profile helps preserve hemodynamic stability, which is critical for ischemia-prone ACS patients. Maintaining PD also avoids unnecessary HD catheter placement-reducing infection and bleeding risks-while preserving the established dialysis modality and continuity between acute and chronic care. When facing skepticism from other specialties, our experience shows that appropriate prescription intensification allows most patients to be stabilized with PD alone, meeting clinical needs in many scenarios.

Practical considerations

Optimize the PD prescription: Use higher-concentration dextrose, add icodextrin, and increase exchange frequency; ideally employ Automated Peritoneal Dialysis (APD) to enable frequent, reliable adjustments.

1. Recognize physiological limits: Very short dwells can cause sodium sieving-free-water removal exceeding sodium

clearance-limiting net decongestion; monitor closely for hyperglycemia with high-glucose solutions.

2. Predefine escalation criteria: Escalate to HD or Continuous Renal Replacement Therapy (CRRT) for persistent hypoxemia, lack of radiographic improvement, or inadequate ultrafiltration despite maximal PD adjustments.
3. These measures frame PD as a structured, monitorable, and proactively adjustable Intensive Care Unit (ICU) strategy rather than a passive or insufficient option.

CONCLUSION

This study provides preliminary evidence: In ESRD patients presenting with ACS and pulmonary edema, appropriately adjusted PD can, in most cases, control fluid overload and often avoids conversion to HD; only a minority require temporary HD due to inadequate ultrafiltration. The overall data support PD's feasibility and safety as an acute management strategy. Next steps should include larger, multicenter, prospective studies with long-term follow-up to validate and quantify effectiveness, clarify key predictors of success (e.g., residual urine output, peritoneal transport characteristics), and establish consistent clinical pathways and escalation/conversion criteria. Improving interdisciplinary familiarity with acute PD management is equally important; as intensivists and cardiologists gain confidence in PD's capabilities, the reflex to recommend HD is likely to diminish, promoting more collaborative, patient-centered care.

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