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Development of new method for continuous kidney replacement therapy weaning: a pilot study

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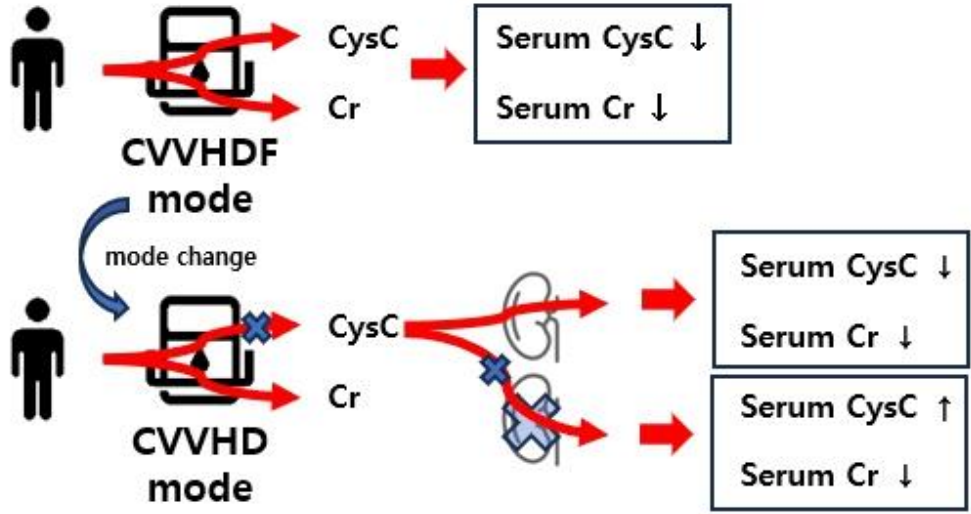
Objectives : Currently, there is no established weaning method for continuous kidney replacement therapy (CKRT), and the criteria for assessing the recovery of underlying kidney function are ambiguous. Creatinine and cystatin C are commonly used indicators of kidney function, with molecular weights of 113 Da and 13.3 kDa, respectively. We aimed to develop a new weaning protocol by assessing kidney function recovery in CKRT patients using these markers.

Methods : This pilot study recruited 10 patients undergoing CKRT from two medical institutions. Patients maintaining vital signs without the need for vasopressors were transitioned from continuous veno-venous hemodiafiltration (CVVHDF) mode to continuous veno-venous hemodialysis (CVVHD) mode. Serum creatinine and cystatin C levels were measured at 6, 12, and 24 hours after the mode change. Changes in serum creatinine and cystatin C were analyzed between patients with reinitiating of renal replacement therapy (RRT) and those not requiring RRT.

Results : RRTs were reinitiated in 5 patients. Serum creatinine levels remained similar or decreased in all patients after the switch from CVVHDF to CVVHD mode. In contrast, serum cystatin C levels increased in the RRT reinitiated group, while either decreased or remained stable in the non-RRT reinitiated group. Notably, one patient in the RRT reinitiated group had a daily urine output of 590 mL, and one patient in the non-RRT reinitiated group had a daily urine output of 160 mL. The change patterns of serum cystatin C were superior in accurately predicting these two patients. (serum cystatin C change 2.30→2.50→2.48→2.70 mg/L in patient with daily urine output 590 mL and serum cystatin C change 1.65→1.60→1.72→1.73 mg/L in patient with daily urine output 160mL).

Conclusions : Periodic measurement of serum cystatin C after transitioning to CVVHD mode appears to be useful in assessing kidney function recovery. Based on this pilot study, we plan to conduct research to develop a CKRT weaning protocol.

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