

투석 중 저혈압 발생이 빈번한 혈액투석 환자에서 헤모콘트롤을 이용한 혈액투석의 임상적 유용성: 다기관 전향적 교차비교 연구

가톨릭대학교 의과대학 신장내과¹, 고려대학교 의과대학 신장내과², 순천향대학교 의과대학³
연세대학교 원주의대 신장내과⁴, 을지대학교 의과대학 신장내과⁵

조윤희¹, 권영주², 송호철¹, 김영옥¹, 김진국³, 한병근⁴, 이소영⁵, 길효욱³, 방기태⁵, 김용수¹

Clinical Evaluation of Hemocontrol in Hypotension-Prone Hemodialysis Patients: A Multi-Center Prospective Cross-Over Study

Yul Hee Cho¹, Young Joo Kwon², Ho Cheol Song¹, Young Ok Kim¹, Jin Kuk Kim³
Byoung Geun Han⁴, So Young Lee⁵, Hyo Wook Gil³, Kitae Bang⁵, Yongsoo Kim¹

Division of Nephrology¹ The Catholic University of Korea College of Medicine
Division of Nephrology² Korea University Medical College
Division of Nephrology³ Soonchunhyang University College of Medicine
Division of Nephrology⁴ Yonsei University Wonju College of Medicine
Eulji University Medical School⁵

Background: The Hemocontrol (HC) biofeedback system (Gambro, Stockholm, Sweden) consists in a fully integrated biofeedback system that monitors and regulates blood volume contraction during hemodialysis (HD) through software-driven adjustments of ultrafiltration rate and dialysate conductivity. The aim of this study was to evaluate the effect of automatic blood volume control on the incidence of intradialytic hypotension (IDH) in Korean hypotension-prone HD patients.

Methods: In this prospective cross-over study, 76 hypotension-prone patients were enrolled from 9 HD centers, and 60 patients (19 males, 31.6%; age 57 ± 11 years; HD duration 58.3 ± 45.8 months) completed the study. The study included period A (current best practice HD for 8 weeks), B0 (HD with Hemoscan blood volume monitoring for 2 weeks), and period B1 (Hemocontrol HD treatments for 8 weeks).

Results: The overall occurrence of symptomatic IDH was significantly less in period B1 compared with period A (37% vs. 61%, $p < 0.0001$). The reduction rate accounted for 39%. According to our definition of good response as decrease in IDH session $> 20\%$, 80% of the hypotension-prone HD patients responded well to HC biofeedback system. The number of nursing intervention to manage IDH was also significantly decreased in period B1 compared with period A (0.55 per session vs. 0.95 per session, $p < 0.0001$). In addition, the number of nursing intervention per IDH occurred session was less in period B1 compared with period A (1.26 vs. 1.46, $p < 0.01$). The patients' fatigue after dialysis assessed subjectively using scale (0, not at all; 10, extremely) tended to decrease in period B1 compared with period A (4.9 vs. 5.4, $p = 0.064$). The recovery time of fatigue after dialysis was faster in period B1 compared with period A. The pre-dialysis mean arterial pressure (MAP) was not different between period A and period B1. However, the post-dialysis MAP was significantly higher in period B1 compared with period A (92.7 ± 11.4 vs. 87.6 ± 10.6 mmHg, $p < 0.01$). There was no difference in interdialytic weight gain, urea reduction ratio, serum electrolytes, hemoglobin and serum albumin levels between period A and period B1.

Conclusion: These data suggests that Hemocontrol biofeedback system may improve the patient tolerability to hemodialysis through the reduction of IDH occurrence in Korean hypotension-prone HD patients.

Key Words: 혈액투석, 저혈압, 혈액량조절

Hemodialysis, Hypotension, Blood volume control