

유지 혈액 투석 환자에서 심혈관계 질환 위험인자로서 Malnutrition–Inflammation–Depression–Arteriosclerosis (MIDA) 증후군의 임상적 의미

한림의대 신장내과, 한림대 신장연구소

최명진, 구자룡, 윤종우, 이창섭, 이영기, 김수진, 오지은, 박태진, 서장원, 송영림, 김형직, 노정우

Association of the Malnutrition–Inflammation–Depression–Arteriosclerosis (MIDA) Syndrome with Adverse Cardiovascular Outcome in Chronic Hemodialysis (HD) Patients: A 5–Year Prospective Study

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Introduction: Cardiovascular disease (CVD) is a leading cause of morbidity and mortality in ESRD patients. Among many risk factors, inflammation has been identified as playing a key role in the pathogenesis of CVD in ESRD patients, especially in conjunction with malnutrition and arteriosclerosis. Depression, the most common psychological complication of chronic dialysis patients, is also known to be closely associated with inflammation, suggesting the presence of a syndrome composed of malnutrition, inflammation, depression and arteriosclerosis (MIDA syndrome). The purpose of this study was to investigate the association of MIDA syndrome with adverse cardiovascular outcome in chronic HD patients.

Methods: Eighty–one HD patients (age 53 ± 13 years, HD duration 53 ± 39 months, male 54%, diabetes 38%) were followed up for 5 years. As an indicator of arteriosclerosis, brachial–ankle pulse wave velocity (PWV) was measured using a plethysmography (Colin Co., Japan). Nutritional status was assessed by serum albumin level and the presence of inflammation was assessed by serum high sensitivity C–reactive protein (hsCRP) level. Depression was assessed with the Beck Depression Inventory (BDI, range 0–63) and confirmed by DSM–IV criteria for major depressive disorder.

Results: Forty–two (52%) patients had malnutrition (serum albumin < 4.0 mg/dL) and 39 (48%) patients had inflammation (serum hsCRP > 1 mg/L). The prevalence of depression by DSM–IV criteria was 51% ($n=41$). Sixty–three (78%) patients had arteriosclerosis (measured PWV $>$ expected PWV based on age/BP/gender adjustment). Mean total MIDA score, which was calculated with the sum of number of positive MIDA components was 2.4 ± 1.3 (range, 0–4). Each component of MIDA syndrome was well correlated with each other. During follow–up, 40 (16 fatal and 24 non–fatal) cases of CVD occurred. In adjusted Cox analysis using total MIDA score, age, LV mass index, blood pressure, PTH level, Kt/V, presence of diabetes and previous CVD as covariates, only MIDA score and age were independent predictors of CVD events. Kaplan–Meier survival curve showed that probability of new CVD during follow–up period was significantly increased as the total MIDA score increased (Figure, Log Rank test, $p < 0.001$).

Conclusion: This study suggest the presence of MIDA syndrome composed of malnutrition, inflammation, depression and arteriosclerosis, which is associated with an exceptionally high risk of cardiovascular complications in chronic HD patients.

Key Words: 영양장애, 염증, 우울증

Malnutrition, Inflammation, Depression

