ACCMULATION OF PLASMA PENTOSIDINE IN HEMODIALYSIS PATIENTS IS ASSOCIATED WITH DETERIORATION OF NUTRITIONAL STATUS

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OBJECTIVES

Hemodialysis (HD) patients are susceptible to sarcopenia, and in fact many HD patients present sarcopenia, which is related to poor remaining life expectancy. HD patients sometimes develop MIA (malnutrition, inflammation, atherosclerosis) syndrome, and the remaining life expectancy in these patients is very poor. Research on nutritional status in HD patients is an important topic. Advanced glycation end products (AGEs), in addition to being a complication of diabetes, are known to be associated with cardiovascular complications, inflammation and malnutrition in renal failure patients, especially those undergoing HD. We measured plasma pentsidine levels in HD patients and investigated the relationship with nutritional status. The aim of this study was to evaluate whether plasma pentosidine level is elevated in HD patients with poor nutritional status.

SUBJECTS and METHODS

The subjects were 48 HD patients, and their profiles are shown in Table 1. Plasma pentosidine level was measured with ELISA (Fushimi Pharmaceutical, Japan). To evaluate nutritional status, we used daily calorie, protein, and carbohydrate intakes per kilogram (kg), %AMA, lean body mass, estimated muscle mass, estimated skeletal muscle mass, quadriceps muscle area, PCR, and %CGR. Dietary intake (calories, protein, carbohydrates) was evaluated using a brief-type self-administered diet history questionnaire (BDHQ). Lean body mass, estimated muscle mass, and estimated skeletal muscle mass were determined using multifrequency bioelectrical impedance analysis (MFBIA). Next, we investigated the correlations between plasma pentosidine level and daily dietary intakes (calories, protein, carbohydrates per kg), % arm muscle area (AMA), lean body mass, estimated muscle mass, estimated skeletal muscle mass with MFBIA, quadriceps muscle area with computed tomography (CT), protein catabolic rate (PCR), and % creatinine generation rate (%CGR).

The statistical difference was determined with two-sided Student's test. Differences of $P < 0.05$ were considered significant. Pairwise associations were examined with Pearson's correlation coefficient test

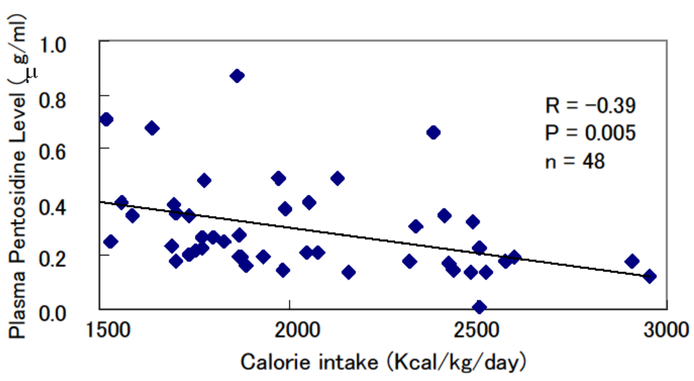

Figure 1. Correlation between daily calorie intake and plasma Pentosidine level

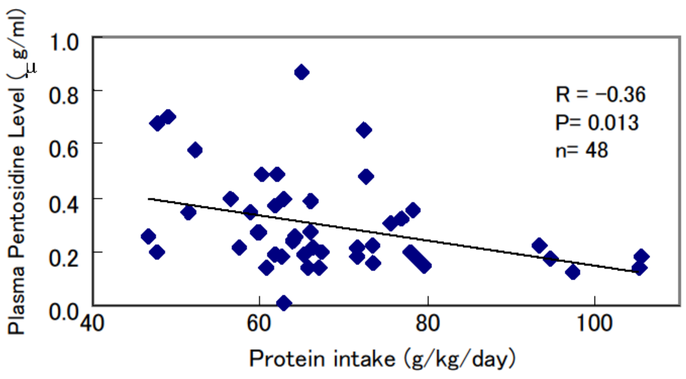

Figure 2. Correlation between protein intake and plasma Pentsidine level

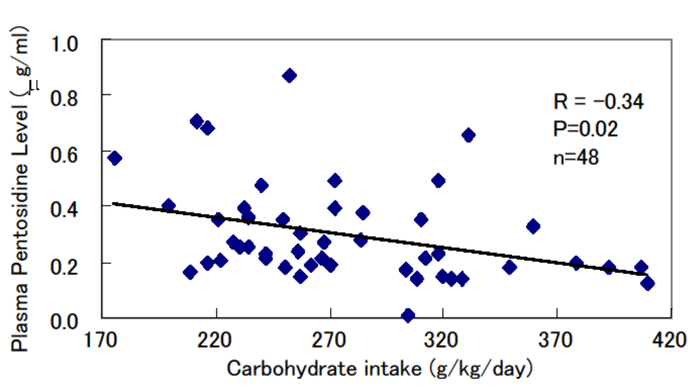

Figure3. Correlation between daily carbohydrate intake and plasma Pentosidine level

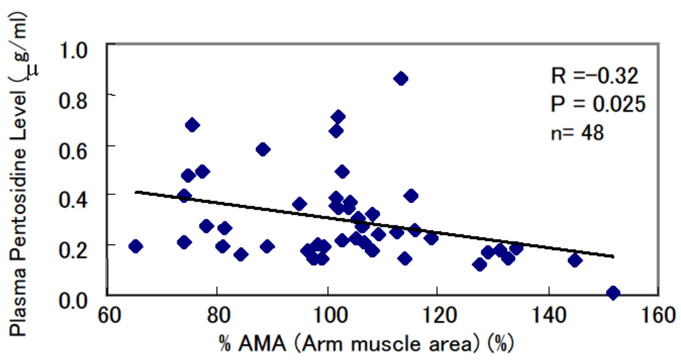

Figure 4. Correlation between %AMA and plasma Pentsidine level

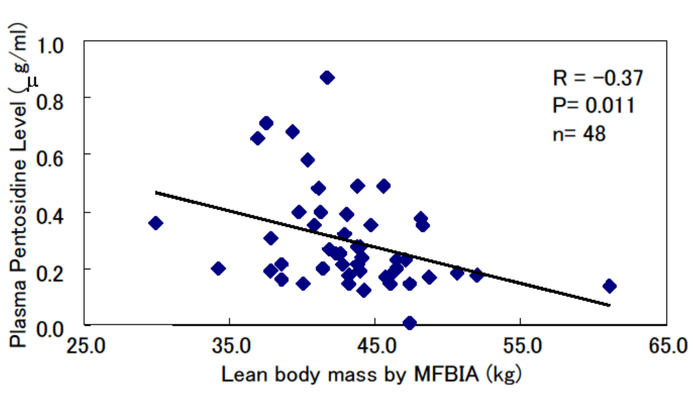

Figure 5. Correlation between leam body mass by MFBIA and plasma Pentsidine level

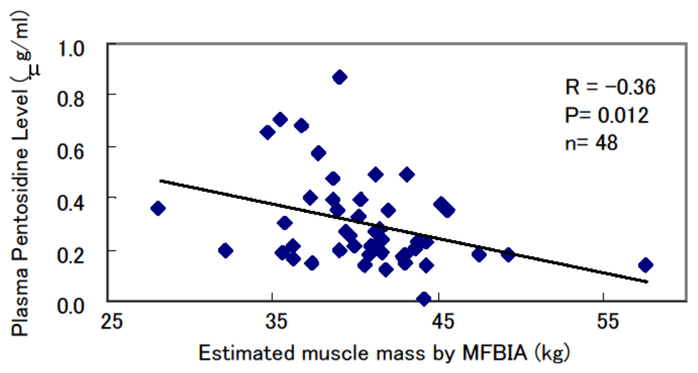

Figure 6. Correlation between estimated muscle mass by MFBIA and plasma Pentosidine level

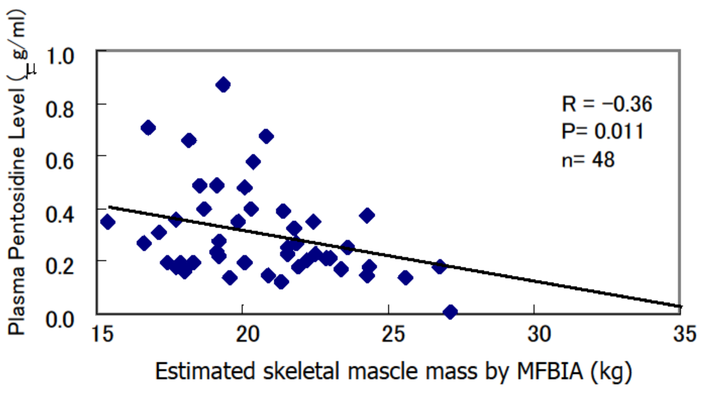

Figure 7. Correlation between estimated skeltal mascle mass and plasma Pentsidine level

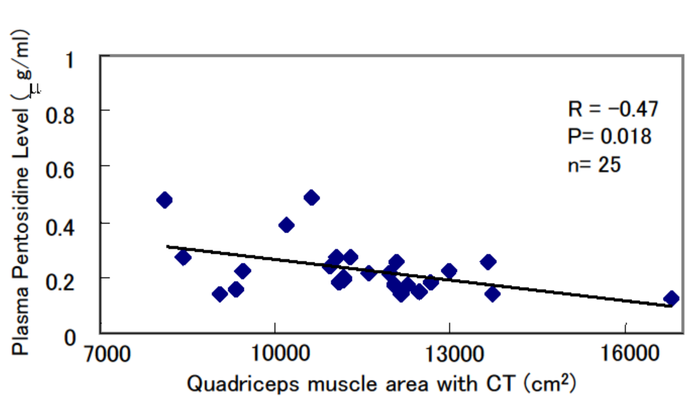

Figure 8. Correlation between quadriceps muscle area with CT and plasma Pentsidine level

Table 1. Patient profile

Number of patients	48
Age (years)	53.3 ± 9.8
Male : Female	48 : 0
HD history (months)	150.5 ± 99.8
Height (cm)	168.3 ± 6.5
Dry BW (kg)	62.1 ± 10.6
BMI (kg/m^2)	21.9 ± 3.1
HD duration (hours/session)	4.8 ± 0.6
Total HD duration (hours/week)	15.3 ±2.6
Hemodialysis product (HDP)	48.8 ± 11.6

RESULTS

In HD patients, an inverse correlation was seen between plasma pentosidine level and daily calorie intake per kg (R = -0.39, P = 0.005) (Fig. 1), daily protein intake per kg (R = -0.36, P = 0.013) (Fig. 2), daily carbohydrate intake per kg (R = -0.34, P = 0.02) (Fig. 3), %AMA (R = -0.33, P = 0.025) (Fig. 4), lean body mass (R = -0.37, P = 0.011) (Fig. 5), estimated muscle mass (R = -0.36, P = 0.012) (Fig. 6), estimated skeletal muscle mass (R = -0.36 , P = 0.011) (Fig. 7), and muscle area on CT (R = -0.47, P = 0.018) (Fig.8). However, no correlation was seen with PCR or %CGR.

CONCLUSIONS

In HD patients, plasma pentosidine level is inversely correlated with nutritional status and muscle mass. Accumulation of pentosidine is thought to be associated with deterioration of nutritional status.

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