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DIFFERENCES OF ERYTHROCYTE MEMBRANE CONTENTS OF FATTY ACID ACCORDING TO KIDNEY FUNCTION

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Objectives: Patients with chronic kidney disease (CKD) are at high risk for cardiovascular disease (CVD). Erythrocyte membrane oleic acid contents are significantly higher in patients with acute coronary syndrome than general population. Previous study showed that omega-3 fatty acid (FA) supplementation reduced erythrocyte membrane oleic acid contents. The aim of this study was to compare the changes of erythrocyte membrane FA contents including oleic acid according to kidney function.

Methods: We recruited 101 CKD patients and 118 dialysis patients. In addition, 33 healthy volunteers were included as normal controls. The erythrocyte membrane FA contents were measured by gas chromatography.

Results:

The mean ages of the enrolled population were 55.0 ± 13.2 years and male was 52.0 %. Diabetes was 49.5% in CKD patients and 54.2% in dialysis patients. Levels of serum creatinine were 0.9 ± 0.2 mg/dL in controls, 1.5 ± 0.7 mg/dL in CKD patients, and 11.5 ± 3.1 mg/dL in dialysis patients ($P < 0.001$). The erythrocyte membrane contents of saturated FA, monounsaturated FA (MUFA), and oleic acid in dialysis patients were highest among three groups. Compared to CKD patients, erythrocyte membrane contents of polyunsaturated FA, omega-6 FA including linoleic acid (LA) and arachidonic acid, omega-3 FA including EPA and DHA, and omega-3 index were significantly lower in dialysis patients. Compared to CKD patients, MUFA including oleic acid was significantly higher in dialysis patients. Compared to controls, erythrocyte membrane content of LA was significantly lower and MUFA including oleic acid contents were significantly higher in CKD patients. In CKD patients, glomerular filtration rate was positively associated with erythrocyte membrane contents of LA.

Conclusions: Erythrocyte membranes FA contents were significantly changed according to kidney function. Therefore, LA and omega-3 FA supplementation are necessary to correct erythrocyte membranes FA contents especially in CKD and dialysis patients.