

## Dietary fatty acid intake in hemodialysis patients and associations with circulating fatty acid profiles: a cross-sectional study

### ABSTRACT

**Objectives:** The aims of this study were threefold: first, to assess the dietary fatty acid (FA) intake and blood FA status in Malaysian patients on hemodialysis (HD); second, to examine the association between dietary FA intakes and blood FA profiles in patients on HD; and third, to determine whether blood FAs could serve as a biomarker of dietary fat intake quality in these patients. **Methods:** Using 3 d of dietary records, FA intakes of 333 recruited patients were calculated using a food database built from laboratory analyses of commonly consumed Malaysian foods. Plasma triacylglycerol (TG) and erythrocyte FAs were determined by gas chromatography. **Results:** High dietary saturated fatty acid (SFA) and monounsaturated fatty acid (MUFA) consumption trends were observed. Patients on HD also reported low dietary  $\omega$ -3 and  $\omega$ -6 polyunsaturated fatty acid (PUFA) consumptions and low levels of TG and erythrocyte FAs. TG and dietary FAs were significantly associated respective to total PUFA, total  $\omega$ -6 PUFA, 18:2  $\omega$ -6, total  $\omega$ -3 PUFA, 18:3  $\omega$ -3, 22:6  $\omega$ -3, and trans 18:2 isomers ( $P < 0.05$ ). Contrarily, only dietary total  $\omega$ -3 PUFA and 22:6  $\omega$ -3 were significantly associated with erythrocyte FAs ( $P < 0.01$ ). The highest tertile of fish and shellfish consumption reflected a significantly higher proportion of TG 22:6  $\omega$ -3. Dietary SFAs were directly associated with TG and erythrocyte MUFA, whereas dietary PUFAs were not. **Conclusion:** TG and erythrocyte FAs serve as biomarkers of dietary PUFA intake in patients on HD. Elevation of circulating MUFA may be attributed to inadequate intake of PUFAs.

**Keyword:** Circulating fatty acids; Plasma; Erythrocytes; Dietary fat; Hemodialysis