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Associations between n-3 index and systemic lupus erythematosus disease activity

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Higher consumption of n-3 polyunsaturated fatty acids (PUFAs) is associated with reduced severity of cardiovascular disease (CVD) and autoimmunity⁽¹⁾. The n-3 index (O3I), which correlates to n-3 PUFA habitual intake, is a useful clinical biomarker in determining cardiovascular risk⁽²⁾. Individuals with an O3I <4% are considered to have higher cardiovascular risk, with 4–8% characterised as medium risk. The desirable O3I is >8% and deemed low risk for a cardiovascular event⁽³⁾. Yet, little is known about O3I in systemic lupus erythematosus (SLE) patients who have a higher risk of CVD associated with their disease. This analysis aimed to determine the O3I of SLE patients, and its associations with disease activity.

A non-fasted blood sample was collected from SLE patients (n = 15) and healthy participants (n = 15). Isolated red blood cells were used to determine O3I and expressed as %. Habitual intake of fish, a rich source of n-3 PUFAs was assessed by questionnaire. Disease activity of SLE patients was assessed by a clinician using the British Isles Lupus Assessment Group (BILAG), Systemic Lupus Activity Measure-Revised (SLAM-R) and Systemic Lupus Erythematosus Disease Activity Index (SLEDAI). Mann-Whitney U was used to evaluate O3I differences between SLE patients and healthy participants. Spearman's rank coefficient assessed associations between O3I and SLE disease activity.

SLE patients had an O3I of 4.38% and categorised to have a medium risk of a cardiovascular event, which was significantly lower compared to healthy participants for cardiovascular risk (5.48%; $p < 0.01$). Some 67% SLE patients (n = 10) reported to never/rarely consume fish (≤ 1 portion per month) whereas 53% healthy participants (n = 8) reported that they consumer >2 portions of fish per month. Correlation analysis showed O3I was negatively associated with BILAG ($\rho = -0.061$), SLAM-R ($\rho = -0.215$) and SLEDAI ($\rho = -0.122$); albeit these associations were not significant ($p > 0.05$).

This is the first report of O3I in SLE patients and identified lower O3I compared to healthy participants, suggesting that SLE patients might benefit from increasing fish consumption to reduce their risk of CVD. Further research is required to fully elucidate associations between O3I and SLE disease activity.

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References

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