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Cross-sectional study to evaluate the association between Vitamin D status and endothelial function in overweight and obese, post-menopausal women

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Cardiovascular diseases (CVDs) are a major public health concern and are associated with an increased risk for mortality and morbidity[1]. Many studies suggest that low levels of vitamin D are associated with an increased risk of CVD[1, 2]. This association may be explained by the link between vitamin D (25OHD) with pathways involved in the regulation of insulin signalling and endothelial function (EF)[3].

The aim of this cross-sectional study was to investigate the associations between plasma 25OHD concentration and EF (flow mediated dilation and pulse wave velocity). Eighty healthy (with no established medical diagnosis), non-smoking, overweight and obese, post-menopausal women with a body mass index (BMI) between 25·0 and 40·0 kg/m^2, and age range between 50 to 70 years old were recruited in the study. Plasma 25OHD was measured by using immunoassay. Basic anthropometric measurements, body composition, resting blood pressure, post-occlusive reactive hyperaemia, pulse wave velocity were obtained using standard protocols.

Approximately 37·5 % of the participants were vitamin D sufficient (>50 nmol/L). Majority of the participants (41·3 %) were vitamin D insufficient (25–50 nmol/L) and 21·3 % were vitamin D deficient (<25 nmol/L).

	Without deficiency (50 nmol/L and above, n = 30)	Deficiency (less than 50 nmol/L, n = 50)	p-value
Age (y)	61·4 ± 7·0	61·0 ± 5·6	<0·05
Height (cm)	159·4 ± 6·2	160·6 ± 6·4	0·96
Weight (kg)	77·2 ± 14·4	76·1 ± 13·6	0·82
BMI (kg/m2)	30·0 ± 4·9	29·4 ± 4·2	0·23
WC (cm)	96·7 ± 14·0	94·8 ± 10·9	0·99
Fat Mass (kg)	31·9 ± 10·4	30·8 ± 10·3	0·69
SBP (mm Hg)	137·3 ± 22·0	130·2 ± 16·4	0·20
DBP (mm Hg)	75·2 ± 11·4	74·2 ± 8·2	0·36
PWV(m/s)	−0·8 ± 0·2	−0·7 ± 0·2	0·69
RHI	4·3 ± 2·7	5·8 ± 11·5	0·47

Abbreviations: BMI, body mass index; WC, waist circumference; SBP, systolic blood pressure; DBP, diastolic blood pressure; PWV, pulse wave velocity; RHI, reactive hyperaemia index

Among all subjects, PWV was negatively related to SBP ($r = -0{\cdot}412$, $P < 0{\cdot}01$) and DBP ($r = -0{\cdot}480$, $P < 0{\cdot}01$). However, there are no significant relationship between arterial distensibility and vitamin D. The vitamin D deficient group had lower RHI value compared to vitamin D insufficient and vitamin D sufficient group. However, the differences are not significant.

In conclusion, the results of the present study did not support the hypothesis that serum 25OHD status is associated with vascular endothelial function among overweight and obese, post-menopausal women.

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