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CONSUMPTION OF REPEATEDLY HEATED PALM AND SOY OILS CAUSES SIMILAR EFFECT ON BLOOD PRESSURE AND AORTIC MORPHOMETRY IN RATS

Ng CY, Kamisah Y¹, Qodriyah MS¹, Faizah O², Xin-Fang L¹, Kamsiah J¹

Department of ¹Pharmacology and ²Anatomy, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

Background:

Oil thermoxidation during the process of deep frying generates harmful oxidative oxygen radicals that increase the risk of hypertension. The purpose of this study was to investigate and compare the effect of repeatedly heated palm and soy oils on blood pressure and aortic wall remodelling in rats.

Materials and Methods:

Male Sprague-Dawley rats were divided into seven groups and fed as follows: (i) basal diet (control); basal diet fortified with 15% weight/weight (w/w) (ii) fresh palm oil (FPO) or (iii) fresh soy oil (FSO); (iv) five-time-heated palm oil (5HPO) or (v) five-time-heated soy oil (5HSO); (vi) ten-time-heated palm oil (10HPO) or (vii) ten-time-heated soy oil (10HSO). Feeding duration was 24 weeks. Blood pressure was measured at baseline and at intervals of four weeks using tail-cuff method. After 24 weeks the rats were sacrificed and the aortic arches were taken out for histological and morphometric measurements which including intima-media thickness (IMT), intima-media area (IMA), lumen diameter, elastic fibre lamellar number and circumferential wall tension (CWT).

Results:

Both FPO and FSO groups did not show any significant changes in blood pressure and morphometric measurements. There were significant increases in blood pressure, IMT, IMA and CWT in the five-time and ten-time-heated oils treated groups compared to control and fresh oils groups. However, there were no significant differences in lumen diameter and lamellar number among the groups. Histomorphology showed increased interlamellar space in aortas of five-time and ten-time-heated oils treated rats, indicating aortic hypertrophy. No significant differences in the effects of palm and soy oils on blood pressure and aorta morphometry were observed.

Conclusion:

Prolonged consumption of repeatedly heated palm and soy oils similarly causes blood pressure elevation and hypertrophy of aortic wall.

Keywords:

hypertension, blood pressure, aorta, palm oil, soy oil.