

THE INFLUENCE OF DIETARY FAT ON COAGULATION AND PLATELET  
AGGREGATION IN THE MARMOSET

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The role that dietary fats may play in altered thrombogenesis and the development of atherosclerosis has been reviewed (Ardlie 1981; Meade 1981; Jorgensen and Dyerberg 1983). A significant role for the platelet, with its altered function and prostaglandin production under such dietary perturbation, is emerging. This could help provide a mechanistic understanding of the pathogenesis of the disease.

We have examined the influence of a mutton fat (MF) supplemented diet and a sunflower seed oil (SSO) supplemented diet on coagulation indices and platelet aggregation in the marmoset monkey. Standard marmoset chow was prepared with a 15% supplement of each fat, which increased the calorific energy as fat from 18 to about 35%. The diets were fed ad libitum to male marmosets for 5 months, with seven on each fat-supplemented diet and six on control diets. Coagulation indices have been assessed using a Schnitger and Gross twin channel coagulometer and platelet aggregation with a Payton dual channel aggregometer, using citrated blood samples drawn from the femoral artery in conscious marmosets.

The following results have been obtained.

Diet	(n)	CT (min)	PT (s)	APTT (s)	RVVT (s)	Plat. count ( $\times 10^3/\mu\text{L}$ )	Plat. vol. (fl)	ASC threshold ( $\mu\text{g/mL}$ )	ADP threshold ( $\mu\text{M}$ )
Control	(6)	2.10	10.1	29.1	16.1	376	8.7	18.8	4.8
SSO	(7)	2.31	10.1	36.6	22.7*	392	8.1	33.9	7.4
MF	(7)	1.21***	8.5***	25.8**	17.1	479	8.8	11.0*	3.3*

Students t test (compared to controls): \* P < .05, \*\* P < .01, \*\*\* P < .001.

There is a clear difference apparent between the fat-supplemented marmoset groups, with a significant increase in thrombogenesis in the MF-fed marmosets as well as increased platelet count and reactivity (lower threshold). The SSO-fed marmosets, on the other hand, showed reduced coagulability and platelet aggregation. Platelet membranes have not been analysed, but erythrocyte and heart membranes from SSO-fed marmosets showed significantly increased 18:2 levels and  $\omega_6/\omega_3$  ratios, over the MF-fed marmosets.

It is concluded that the dietary fats have a significant influence on membrane lipid composition and the haemostatic parameters. This implies an altered atherogenesis risk, with MF-fed marmosets being more susceptible.

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