

## Increased dietary saturated fat intake decreases the ratio of thromboxane/prostacyclin in healthy male subjects

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The ratio of thromboxane A<sub>2</sub>/prostacyclin I<sub>2</sub> (TXA<sub>2</sub>/PGI<sub>2</sub>) plays a critical role in platelet aggregation (Moncada and Vane 1979). Evidence from dietary intervention studies has found that the ratio of TXA<sub>2</sub>/PGI<sub>2</sub> was decreased by marine omega-3 polyunsaturated fatty acid (n-3 PUFA) in humans (Ferretti et al 1998, von Schacky et al 1985). However, there is no data on the effects of the diet high in saturated fat from animal source on the ratio of urine stable metabolites of TXA<sub>2</sub>/PGI<sub>2</sub> in literature. The aim of the present study was to investigate the effect of dietary saturated fat on ratio of urine stable metabolites of TXA<sub>2</sub>/PGI<sub>2</sub>.

In the present study we investigated the effect of dietary saturated fat on the ratio of urine excretion 11-dehydro thromboxane B<sub>2</sub> (TXB<sub>2</sub>) and 6-keto prostaglandin F 1α (PGF 1α) in 27 healthy aged 30 to 55 years free-living male subjects. Each volunteer was randomly assigned to one of the two diets for a period of 4 weeks, after which each subject resumed his usual diet for 2 weeks as a 'wash-out period', before being assigned to the other diet for a further 4 weeks. The two diets were designed to provide similar amounts of energy, protein, dietary fiber, and alcohol, differing only in the amount of fat. The high fat (HF) diet was designed to provide 10–15 % more energy from animal fat compared to the low fat (LF) diet. Twenty-seven subjects collected their 24-hour urine on the last day of each of the diets. The samples were stored at – 20°C for later analysis. The concentrations of 11-dehydro TXB<sub>2</sub> and 6-keto prostaglandin F 1α in the urine was determined by using an enzyme immunoassay (EIA) method with commercially available EIA kits. Serum lipids from 12 randomly selected subjects were extracted by chloroform : methanol (1:1, v/v). Methyl esters of fatty acids of serum lipids were prepared by standard methods. Methyl esters of fatty acids were separated by gas chromatography as described.

The ratio of urine excretion 11-dehydro TXB<sub>2</sub> and 6-keto PGF 1α was significantly lower in the HF (2.7 ± 0.2) than in the LF diet (3.1 ± 0.3) (p < 0.05). Serum concentration of 20:4n-6 was 6% higher in the HF than in the LF diet, while the proportion of 20:4n-6 was 5% lower in the HF than in the LF diet. Compared with the LF diet, the concentration and proportion of 14:0, 18:0, 20:0 and total saturated fatty acid in serum was significantly higher in the HF diet (p < 0.05), and 18:3n-3 and the ratio of n-3 PUFA to n-6 PUFA was significantly lower in HF diet (p < 0.05). The present result indicate that decreased ratio of urine excretion of 11-dehydro TXB<sub>2</sub> to 6-keto PGF 1α in the HF diet compared with the LF diet may be caused by decreased intake of 20:4n-6 proportion, rather than intake of absolute amount of 20:4n-6.

1. Moncada S, Vane JR. Arachidonic acid metabolites and the interactions between platelets and blood vessel walls. *N Engl J Med* 1979; 300: 1142–1148.
2. von Schacky C, Fisher S, Weber PC. Long term effect of dietary marine omega-3 fatty acids upon plasma and cellular lipids, platelet function, and eicosanoid formation in humans. *J Clin Invest* 1985; 76: 1626–1631.