

# Turmeric Reverses Fibrinogen

## Spice Lowers Biomarker of Aging and Important Cardiovascular Risk Factor

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Fibrinogen is a high molecular weight plasma protein that plays a key final role in the cascade that results in the clotting of blood (Fig. 1). Elevated blood levels of fibrinogen have been identified in a number of studies to be a major risk factor for coronary heart disease (heart attacks) and cerebrovascular disease (strokes), which together account for about 60% of deaths in the elderly. In fact, fibrinogen may possibly be the major risk factor, exceeding the “contributions” of homocysteine, cholesterol and other lipid parameters in the pathogenesis of these diseases. Elevated fibrinogen levels have also been associated with a number of other diseases, including cancer, diabetes and hypertension (Welin, 1987; Kannel, 1987).

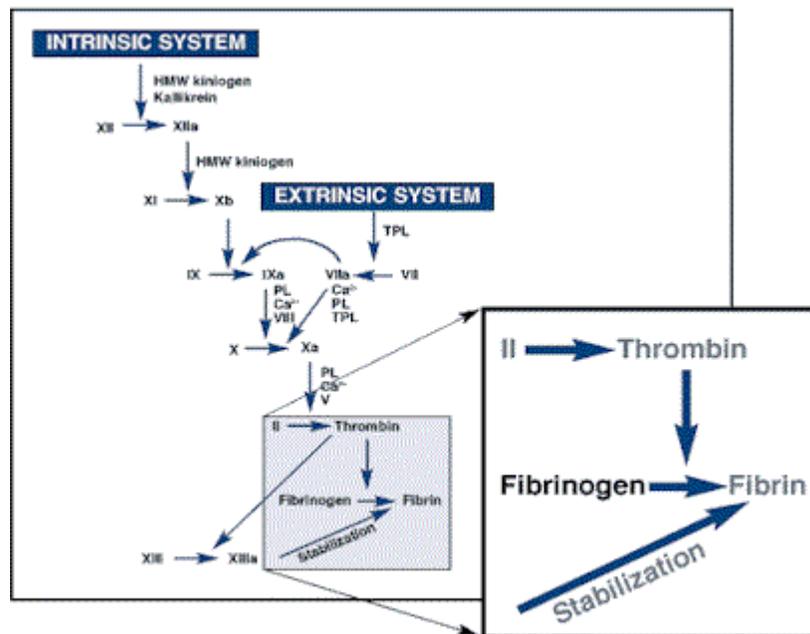


Fig. 1: Clotting cascade showing the key position of fibrinogen.

In a study to determine the relative risk of elevated fibrinogen on disease, compared to other risk factors such as cholesterol and C-Reactive Protein (CRP) -- an acute phase-reactant -- scientists in London conducted a prospective study on over 3,000 patients with angina pectoris. The scientists found that if fibrinogen levels were low, even highly elevated levels of cholesterol and/or C-reactive protein presented little risk of heart attacks. However, high levels of fibrinogen in combination with low-moderate levels of cholesterol presented a significant risk (Fig. 2).

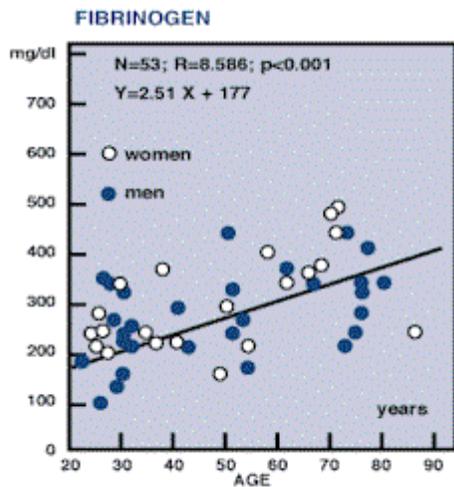
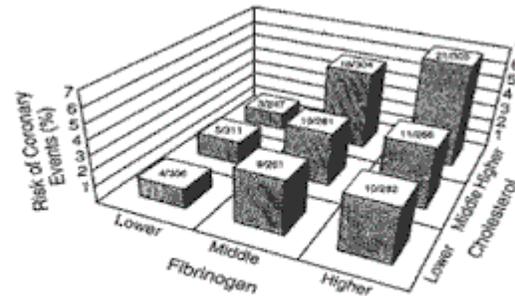


Fig. 3: Increase of plasma fibrinogen in healthy men and women of various ages (Hager, Felicetti, et al, 1994).

A



B

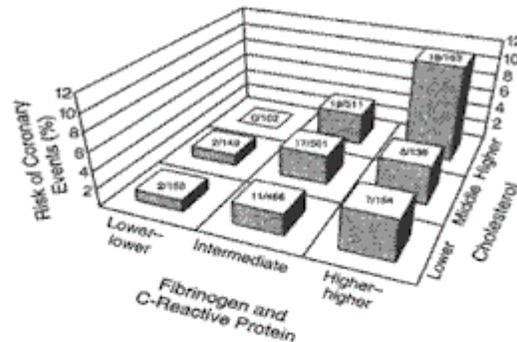


Fig. 2: Incidence of heart attacks during two years of follow-up, according to concentrations of fibrinogen, C-Reactive Protein, and total cholesterol. Panel A shows the risk of heart attack according to fibrinogen and total cholesterol. Panel B shows the risk according to fibrinogen and C-Reactive Protein combined, as compared to total cholesterol. It is clear that elevated fibrinogen greatly increases the risk associated with these other two risk factors (Thompson, et al., 1995).

### Fibrinogen as a Biomarker

Fibrinogen levels have been shown by a number of research teams to rise predictably with age (Yarnell, et al, 1991; Fu and Nair, 1998;). The most carefully performed of these studies confirming the age-related increase of fibrinogen was conducted on 111 volunteers of various ages, who rated themselves as being in good health. The researchers screened out those who had slight abnormalities in clinical laboratory tests or medical history to rule out patients who had diseases which might themselves cause elevations in fibrinogen. They ended up with 53 subjects who the researchers deemed to be in excellent health. Plasma fibrinogen levels were determined in these subjects, resulting in the data illustrated in Fig. 3. This illustrated an increase in plasma fibrinogen of about 25 mg/dl per decade.

A team of scientists in China also recently compared fibrinogen levels in two families, one family with a history of long life in many of its members, compared to another family with traditionally shorter life expectancies. The scientists concluded that low plasma fibrinogen levels are correlated with longer life (Wang, et al, 1998).

### Reducing Plasma Fibrinogen

Although elevated blood fibrinogen levels have been clearly implicated in aging and numerous age-related diseases, clinicians have not paid much attention to this factor because no one knew what to do about it. No drug (with the exception of estrogen), nutrient, or lifestyle change was known to significantly alter fibrinogen levels, although cigarette smoking has been related to elevations in fibrinogen, and quitting smoking does, in fact, result in slight reductions in fibrinogen levels. However, for those of us who don't smoke, there has been little, if any, advice which could be given to lower fibrinogen.

In 1997, Dr. Hidetoshi Kawashima, a Japanese scientist, reported that high doses (100 mg/kg/day) of vitamin K2 (Menatetrenone) given to hypercholesterolemic rabbits reduced levels of fibrinogen without adverse effects (including promoting excessive blood coagulation). However, this translates to a heroic human dose ranging between 70 and 700 mg/day (compared to the RDA of 80 mcg).

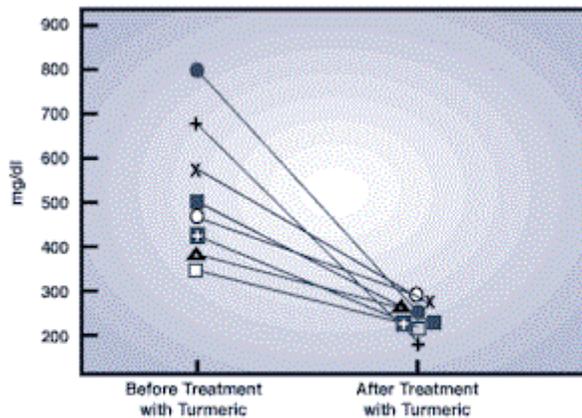


Fig. 4: Effects of Turmeric on plasma fibrinogen levels in eight subjects after only 15 days treatment (Ramirez-Bosca, 2000).

### Turmeric Lowers Fibrinogen

It now appears, however, that there may be a more practical approach to reduce fibrinogen levels, and the inherent risk of hyper-fibrinogenemia-related diseases. It is with the common herb, *Curcuma longa* (turmeric). Scientists in Spain have previously demonstrated that turmeric is an extremely potent antioxidant, capable of dramatically reducing blood levels of lipid peroxides and oxidized lipoproteins (Ramirez-Bosca, et al, 1995, 1997).

In this most recent study, Ramirez-Bosca and her colleagues (2000) selected eight subjects with elevated fibrinogen levels and treated them with 20 mg of *Curcuma longa* (turmeric) extract per day. After only 15 days, previously elevated levels of fibrinogen dropped like a rock in all eight subjects (Fig. 4). No adverse effects were noted by any of the subjects, nor were there any

adverse changes in any other blood chemistries. The safety of Turmeric is unquestioned, since some people have been known to regularly consume as much as 3.8 grams daily, without adverse effects.

### Conclusion

Turmeric thus appears to be an extremely safe, highly effective means of reversing elevated blood levels of fibrinogen, which has heretofore been considered an unreversible and highly dangerous risk factor and biomarker.

### References:

1. Ajmani, R.S., and Rifkind, J.M. Hemorheological changes during human aging. *Gerontology*, 1998, 44: 111-120.
2. Danesh, J., Collins, R., Appleby, P., and Peto, R. Association of fibrinogen, C-Reactive Protein, albumin, or leukocyte count with coronary heart disease, *JAMA*, 1998, 279: 18, 1477-1482.
3. Fu, A., and Nair, K.S. Age effect on fibrinogen and albumin synthesis in humans. *Am J Physiol* 275 (Endocrinol Metab 38), 1998 E1203-E1030
4. Hager, K., Felicetti, M., Seefried, G., and Platt, D. Fibrinogen and aging. *Aging Clin Exp Res*, 1994, 6: 2, 133-138.
5. Hager, K., Seefried, G., Felicetti, M., and Platt, D. Plasma fibrinogen: Are there age-dependent changes? *Arch Gerontol Geriatr, Suppl 4*, 1994, 99-106.
6. Kannel, W.B. Fibrinogen and risk of cardiovascular disease: The Framingham Study. *JAMA*, 1987, 258: 1183.
7. Kawashima, H. Effects of vitamin K2 (Menatetrenone) on atherosclerosis and blood coagulation in hypercholesterolemic rabbits, *Japanese J Pharmacology*, 1997, 75: 135-143.
8. Ramirez-Bosca, A., Soler, A., Carrion-Gutierrez, M.A., et al. Antioxidant curcuma extracts decrease the blood lipid peroxide levels of human subjects. *Age*, 1995, 167-169.

9. Ramirez-Bosca, A., Carrion-Gutierrez, M.A., Soler, A., et al. Effects of the antioxidant turmeric on lipoprotein peroxides: implications for the prevention of atherosclerosis. *Age*, 1997, 20: 165-168.
10. Ramirez-Bosca, A., Soler, A., Carrion-Gutierrez, M.A., Mira, D.P., Zapata, J.P., Diaz-Alperi, J., Bernd, A., Almagro, E.Q., and Miquel, J. An hydroalcoholic extract of *Curcuma longa* lowers the abnormally high values of human-plasma fibrinogen. *Mech Aging Dev*, 2000, 114: 207-220.
11. Thomson, S.G., Kienast, J., Pyke, S.D.M., Haverkate, F., Van de Loo, J.C.W. Hemostatic factors and the risk of myocardial infarction or sudden death in patients with angina pectoris. *N Engl J Med*, 1995, 332: 635-641.
12. Toss, H., and Lindahl, B. Prognostic influence of increased fibrinogen and C-reactive protein levels in unstable coronary artery disease. *Circulation*, 1997, 96: 4204-4210.
13. Qizilbash, N., Jones, L., Warlow, C. Fibrinogen and lipid concentrations as risk factors for transient ischemic attacks and minor ischemic strokes, *Br. Med J.*, 1991, 303: 605-609.
14. Wang, S., Wang, G., Yang, C., Li, X., Xiao, B. Comparison of plasma fibrinogen levels in members of Uygur family of longevity and non-longevity in Xinjiang. *Weisheng Yanjiu*, 1998, 27: 5, 315-316,
15. Welin, L. Analysis of risk factors for stroke in a cohort of men born in 1913. *N Engl J Med*, 1987, 317: 521.
16. Yarnell, J.W.G., Baker, I.A., Bainton, D., et al, Plasma fibrinogen a powerful predictor of CHD, *Circulation*, 1991, 83: 836-844