Letter to the Editor

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Increased Serum Copper in Pulmonary Hypertension: Involvement of Thromboxane?

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Dear Sir: References

Ahmed and Sackner [1985] have recently reported increased serum copper in primary pulmonary hypertension and suggested involvement of the α -adrenergic system, especially as dopamine- β -hydroxylase, is copper dependent. I would like to suggest that thromboxane could be involved and is regulated by copper levels.

Thromboxane is involved in pulmonary hypertension [Frolich et al., 1980]. The distribution of copper is unbalanced in the brain and is more concentrated in the left hemisphere [Delva, 1970]. Since copper acts as a coenzyme of dopamine- β -hydroxylase, which converts dopamine into noradrenaline, there is a higher level of noradrenaline in the left hemisphere [Myslobodsky and Weiner, 1978; Oke et al., 1978]. In the pineal, neural stimulation causes the release of noradrenaline which elevates pineal N-acetyltransferase which controls melatonin production [Namboodiri et al., 1981] and this formation of melatonin is markedly stimulated by noradrenaline [Brownstein and Axelrod, 1974]. Since melatonin is necessary for the thromboxane (TXA₂) receptor to be in the active state, increased melatonin can raise TXA₂ levels [Horrobin et al., 1980].

Thus, the two concepts of increased serum copper and increased thromboxane can be linked via effects on melatonin production.

Ahmed, T.; Sackner, M.A.: Increased serum copper in primary pulmonary hypertension: a possible pathogenic link? *Respiration* 47: 243-246 (1985).

Brownstein, M.; Axelrod, J.: Pineal gland: 24-hour rhythm in norepinephrine turnover. *Science* 184: 163-165 (1974).

Delva, V.A.: in Petelin, Extrapyramidal hyperkinesia. (Medicine, Moscow 1970).

Frolich, J.C.; Ogletree, M.; Peskar, B.A.; Brigham, K.L.: Pulmonary hypertension correlated to pulmonary thromboxane synthesis; in Samuelsson, Ramwell, Paoletti, *Advances in prostaglandin and thromboxane research*, vol. 7 (Raven Press, New York 1980).

Horrobin, D.F.; Manku, M.S.; Oka, M.; et al.: Selective control of formation of 1 and 2 series prostaglandins: a new concept in the regulation of inflammation and immunity. *Future Trends in Inflammation*, Royal College of Surgeons, London 1980 (MTP Press, Lancaster).

Myslobodsky, M.; Weiner, M.: Clinical psychology in the chemical environment. *Psychol. Rep.* 43: suppl. 1, pp. 247-276 (1978).

Namboodiri, M.A.; Favilla, J.; Klein, D.C.: Pineal N-acetyltransferase is inactivated by disulphide-containing peptides: insulin is the most potent. *Science* 213: 571-573 (1981).

Oke, A.; Keller, R.; Mefford, I.; Adams, R.N.: Later-alization of norepinephrine in human thalamus. *Science* 200: 1411-1413(1978).