*Letters to the editor***Essential fatty acid treatment of rats with experimental diabetes: comment**

Dear Sir,

In rats with streptozotocin-induced neuropathy, essential fatty acid (EFA) treatment retained normal erythrocyte velocity in sciatic nerve blood vessels [1]. While this was explained in terms of vasodilator prostanoids, it is also possible that improved blood flow was the result of change in the erythrocytes [2]. Streptozotocin injected at diabetogenic concentrations into rats stimulated an echinocytosis (unpublished observation) and echinocytes have been shown to impair capillary blood flow and to have a reduced oxygen loading and release capacity. Streptozotocin-diabetic rats had significantly less sciatic nerve blood flow and endoneurial oxygen tension than controls [3].

EFA supplementation with Efamol improved filtrability of cigarette smokers' blood [4] and enhanced the rate of healing of leg ulcers in elderly patients [5]. Those studies were based on reports showing that prostaglandin E_1 (PGE_1) increased the fluidity of the erythrocyte lipid bilayer [6] and improved filtrability of rat and human erythrocytes, while PGE_2 had the opposite effect [7].

Willis [8] drew attention to the differing roles of dihomogammalinolenic acid (DHGLA) in man and rodents. He pointed out that DHGLA "... is the biosynthetic precursor for prostaglandin E_1 " and although arachidonic acid may be formed from DHGLA by delta-5-desaturase, "... this enzymatic step is largely lacking in man as compared with rats and mice." That opinion is compatible with the experimental results of Manku et al. [9].

While the findings reported by Professor Tomlinson's group [1] are in accord with the expected benefits of PGE_1 on capillary blood flow in rats with an echinocytosis, it must be emphasised that echinocytic changes are not common in the blood of humans with diabetes. Erythrocyte shape analysis of blood samples from 74 patients with insulin-dependent diabetes showed that only 10 of 74 (13.5%) had more than the normal upper 95% confidence interval for echinocytes. In contrast, none of the blood samples from 78 patients with non-insulin-dependent diabetes showed such changes. Even allowing for the possibility that many factors relating to the patients' diabetes could influence their erythrocyte shape, it seems that the type of erythrocyte change observed in rats with streptozotocin-induced diabetes is unusual in human diabetes. This conclusion implies that although 13.5% of insulin-dependent diabetic patients may respond to evening primrose

oil, the use of other haemorheologic agents needs to be investigated for their effects on the retention of normal erythrocyte velocity in neural vessels of patients with diabetes. Although Ferrari et al. [10] have described the long-term (4 years) benefits of treatment of diabetic patients with the haemorheologic agent pentoxifylline, they did not investigate nerve blood flow.

Sincerely,
L. O. Simpson

References

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