role in the development of late vascular complications of diabetes.

Yours sincerely,
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Tetraploid cells and diabetic nephropathy

Dear Sir,
Polyploidy is an outstanding feature of vascular smooth muscle cells both in spontaneously hypertensive rats and in patients with essential hypertension [1, 2]. An increased number of tetraploid cells has been recently found in human skin fibroblast cultures from patients with Type I (insulin-dependent) diabetes mellitus and nephropathy, possibly in line with a similarity between cell abnormalities of diabetic nephropathy and those of essential hypertension [3, 4].

To understand whether this observation could be extended to fresh cells, we analysed the metaphases of fresh leucocytes and cultured human forearm skin fibroblasts in five patients with Type I diabetes and persistent proteinuria (3 men, 2 women, means ± SEM; median albumin excretion rate 1289.4 ± 262 μg/min; serum creatinine 117.9 ± 26 μmol/l) and in five age- and sex-matched patients with Type I diabetes but normoalbuminuria (median albumin excretion rate 5.06 ± 1 μg/min; serum creatinine 73.6 ± *8.8* μmol/l). Glycated haemoglobin concentrations were not raised in the patients with nephropathy (9.8 ± 0.5 vs 8.8 ± 0.3 %, p = NS).

Tetraploid cells could not be found in any sample of fresh leucocytes, although more than 100 cells were screened in each patient. Furthermore, tetraploid cells were present in similar number in the fibroblast cultures from the patients with nephropathy and from those with normoalbuminuria (1.2 ± 0.6 % vs 1.0 ± 0.5 %, means ± SEM, p = NS).

The overall number of tetraploid cells was lower in our patients than in two previously described and relatively larger groups of patients with similar characteristics (means ± SD: 25 ± 15 % vs 6 ± 4 %, $n = 10$ and $n = 7$, respectively), whose cells were cultured at higher glucose concentration [3].

Thus, to clarify whether an excess number of tetraploid cells could be ascribed to differences in glucose concentrations between culture media, we grew fibroblasts from two Type I diabetic patients with nephropathy and from two without renal complications in media with a high (20 mmol/l) or low (5 mmol/l) glucose concentration. No differences in the number of tetraploid cells were, however, detectable after 15 days, equivalent to two cultural passages (5 mol/l glucose: 2.3 ± 0.3 % vs 20 mmol/l glucose: 4.0 ± 0.6 % means ± SEM, $n = 4$, p = NS).

Proliferation rates, as measured over 7-day growth curves, were not related to the number of tetraploid fibroblasts in this small set of observations. The number of tetraploid cells was not associated with duration of fibroblast storage, nor with glycated haemoglobin concentrations.

Although sample size was relatively small, these results suggest that tetraploidy could be exceedingly rare in fresh cells from patients with Type I diabetes, and cultured skin fibroblasts are not more often tetraploid in diabetic nephropathy. Whether the excess number of tetraploid cells that was described previously could be explained by differences in experimental conditions that cannot be easily identified remains unclear, as glucose concentration in culture media was apparently the single technical condition at variance between this and previous studies [3, 4].

Yours sincerely,
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