

MARKED IMPROVEMENTS IN CARBOHYDRATE AND LIPID METABOLISM IN DIABETIC  
 ABORIGINES FOLLOWING TEMPORARY REVERSION TO TRADITIONAL LIFESTYLE

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In view of (i) the high prevalence of diabetes in many Aboriginal communities when they urbanise, (ii) the mild impairment of glucose tolerance, hyperinsulinaemia and elevated VLDL lipids in non-diabetic Aborigines even when young and lean (O'Dea et al. 1982), and (iii) the improvement in these same parameters in non-diabetic Aborigines following temporary reversion to traditional lifestyle (O'Dea et al. 1980; O'Dea and Spargo 1982), the rationale for the present study was that temporarily reversing the urbanisation process in diabetic Aborigines should improve all aspects of their carbohydrate and lipid metabolism which are linked to insulin resistance.

Ten full-blood diabetic Aborigines from the Mowanjum Community (Derby, Western Australia) agreed to be tested before and after living for 7 weeks as hunter-gatherers in their traditional country in the West Kimberleys. They were middle-aged ( $53.9 \pm 1.8$  yr) and overweight ( $81.9 \pm 3.4$  kg) and all lost weight steadily over the 7-week period (average 8 kg). A detailed analysis of food intake over 2 weeks revealed a low energy intake (1200 kcal/person/d). Despite the high contribution of animal food to the total energy intake (64%), the diet was low in total fat (13%) due to the very low fat content of wild animals.

Oral glucose-tolerance tests (75 g glucose) were conducted in the urban setting and repeated at the end of 7 weeks traditional lifestyle. The marked improvement in glucose tolerance was due to both a fall in fasting glucose ( $11.6 \pm 1.2$  mM before,  $6.6 \pm 0.8$  mM after) and an improvement in postprandial glucose clearance (incremental area under the glucose curve  $15.0 \pm 1.2$  mmol.L<sup>-1</sup>.h<sup>-1</sup>. before,  $11.7 \pm 1.2$  mmol.L<sup>-1</sup>.h<sup>-1</sup>. after). Fasting plasma insulin concentration fell ( $23 \pm 3$  mU/L before,  $12 \pm 1$  mU/L after) and the insulin response to glucose improved (incremental area under the insulin curve  $61 \pm 18$  mU.L<sup>-1</sup>.h<sup>-1</sup>. before,  $104 \pm 21$  mU.L<sup>-1</sup>.h<sup>-1</sup>. after). The marked fall in fasting plasma triglycerides ( $4.0 \pm 0.5$  mM before,  $1.2 \pm 0.1$  mM after) was due largely to the fall in VLDL triglyceride concentration ( $2.31 \pm 0.31$  mM before,  $0.20 \pm 0.03$  mM after).

In conclusion, the major metabolic abnormalities of Type 2 diabetes were either greatly improved or completely normalised in this group of Aborigines by a relatively short reversal of the urbanisation process. Several factors undoubtedly contributed to this. The lifestyle changes operating in the present study encompassed at least three factors known to improve insulin sensitivity: weight loss, low-fat diet and increased physical activity. These factors should be incorporated into any program of primary prevention of diabetes in Aborigines.

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