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Diabetes: the by-product of westernization in Papua New Guinea

TUKUTAU TAUFA[1] AND AMOS L. BENJAMIN[2]

James Cook University, Townsville, Australia and University of Papua New Guinea, Port Moresby

SUMMARY

Before the 1960s diabetes was rare in Papua New Guinea. But by late 1970s there was evidence that diabetes type 2 was increasing among some urban dwellers. The problem is getting worse and in some urban communities the prevalence of diabetes has doubled within 14 years. Unfortunately no one knows the exact magnitude of the problem. Secondly there are simply not enough resources to handle the current known cases. This is compounded by the fact that many Papua New Guineans welcome western lifestyle with open arms. A change of eating habits and lifestyle is vital if any change is to be made to this by-product of westernization.

Diabetes is a relatively new disease among Papua New Guineans. Early medical reports and field surveys showed that it was rare among Melanesians (1,2). During the medical student days of one of us (TT) in the late 1960s any diabetes case among nationals warranted presentation during grand rounds because it was rare. Field surveys in the late 1970s (3) showed that it was increasing – with urban dwellers having higher diabetes rates than those in the rural areas, similar to the urban-rural difference in other Pacific Islands (4). It was the non-insulin-dependent diabetes mellitus (NIDDM) that was increasing. It was more common among pockets of coastal people of Austronesian admixture (5). Among the rural highlanders who are of non-Austronesian origin the prevalence of NIDDM was low. However, among the periurban highlanders there was an unexpectedly high insulin response, which is postulated as the precursor of glucose intolerance, indicating a state of 'metabolic transition'.

Field surveys among the rural Wanigela and Kalo people of Central Province by Dowse and his team in 1994 (6) showed that the difference in diabetes between the two groups of rural Papuans may have been due to some genetic influence. The Wanigela people who live in the urban squatter settlement of Koki in Port Moresby have doubled their prevalence of NIDDM and impaired glucose tolerance (IGT) within 14 years. Their IGT rate was higher than that for the Micronesian Nauruans and second only to the Arizona Pima Indians, who have the world's highest prevalence. The Chinese of Singapore have doubled their NIDDM rate in 8 years (7). The highest prevalence rate among Chinese, however, occurs among those living in Mauritius (8). Chinese in China have the lowest NIDDM rate, supporting the environmental effect on diabetes in those of similar ethnic origin living in different localities (4).

Obesity has always been associated with NIDDM; however, the Wanigelas are less obese than the Nauruans (6). It has been postulated that the 'thrifty gene' favours survival in time of famine in communities where food supply is uncertain. With abundant and assured food supply in modern times, this gene now favours obesity and diabetes. Obesity in the central or upper body has a higher risk. Western nutrition with more animal fats and processed carbohydrates has been associated with higher rates of diabetes

1 School of Public Health and Tropical Medicine, James Cook University, Townsville, Qld 4811, Australia

2 School of Medicine and Health Sciences, University of Papua New Guinea, PO Box 5623, Boroko, NCD 111, Papua New Guinea

among Japanese-Americans in Seattle than those in Japan (9). The urban Koki Wanigelas' diet is similar to a western one while their village relatives have to do more physical work and have a diet that is leaner and with more fibre. Modernity is another factor that was considered to contribute to diabetes among the urban squatter Wanigelan people (6). The urban Wanigelan women's NIDDM rate was higher than that for men, similar to that for Tuvalu women (10), and this is thought to be due to women performing less physical activity than the men. Villagers have to do heavy physical work to get their daily high-fibre food, in comparison to urban dwellers who simply drive to supermarkets for their western diets. This is in contrast to our findings (11) among the 1500 Wopkaimin who are of non-Austronesian genetic stock and the landowners of the Ok Tedi Mines. Despite their significant change in nutrition, lifestyle, modernity, blood pressure and weight since the mine started in 1983 (12), there was only one glucose-positive person during the field blood glucose survey (Advantage blood glucose meter method, Roche Diagnostics). Interestingly, the positive person was a female from the village most distant from the mining town of Tabubil and was not overweight or hypertensive. The results cannot be directly compared to reports in the literature but give some indication of the probability of finding diabetes in the community. The comparative population of 1800 Mt Obree people of Central Province are Austronesian but have no economic project in their area. They live a traditional lifestyle along the foothills of the Owen Stanley Ranges. They have been followed up since 1983 and they have not experienced any change in their mean weight and blood pressure. They also had one person who was positive for blood glucose who was an urban dweller visiting relatives in the village. In May 2001 we surveyed 10 remote villages along the Strickland River that are administered by the Southern Highlands and the Sandaun Provinces (13). They are non-Austronesian and again, out of 200 randomly selected people, there was only one person with positive blood glucose.

The 'westernization' or 'coca-colonization' of Papua New Guinea (PNG) is inevitable. While travelling up the Kikori River in the past, one often encountered coconuts and other jungle debris floating by, but in 1996 empty cans of Coca-Cola and Pepsi were seen, now that the Chevron's Kopi camp was upstream. Living in urban centres, with easy access to modern services, is more attractive than the traditional 'boring' village life. No wonder rural villagers flock to the 'bright lights' of the urban centre like moths to lights. Villagers sell their fresh high-fibre vegetables in urban centres for cash, then buy bread, butter and sugar. One can easily pick out politicians and those who do well in private and public services by their heavier weight, large size and potbelly, which unfortunately are mistakenly regarded as symbols of affluence, power and prestige (14).

With the 'westernization' process there is no doubt that diabetes is increasing alarmingly among certain groups within the country (6). Like many other countries PNG fails to realize this since diabetes, being non-infectious, is not regarded as being important and is not reported accurately (15). It is not even listed in the latest top 29 causes of morbidity and mortality in PNG (16). There are various reasons for this. The National Department of Health data are based on hospital and health centre data. These facilities are not fully utilized for different reasons ranging from accessibility to socioeconomic and cultural factors. There is some under-diagnosis due to lack of facilities and awareness among health workers. Population reports from the Pacific and Asia show that often there are more than four unknown cases of diabetes for each known case (17).

What is worrying are the devastating complications of diabetes. The macrovascular and microvascular complications caused to the kidneys, eyes, nerves and cardiovascular system will heavily tax the already stretched health care services. Population-based studies show that at the time of NIDDM diagnosis, 20% already have diabetic retinopathy (18). The Mauritius study supports the fact that quite often cardiovascular disease changes occur before type 2 diabetes is diagnosed. It is therefore vital that the known preventive nutrition and lifestyle behaviours are adopted. Studies from Da Qing in China show that the incidence of IGT converting to type 2 diabetes can be reduced by one-third by exercise and

weight reduction (19). Indeed this is the crunch of the matter in PNG as alluded to already. An observation at the Ok Tedi mess at Tabubil typifies the nutritional preference that is taking place in the country. Despite health advice given during regular medical check-ups by company medical staff, and the nutrition posters in the company mess, the queue for the 'western food' outlet stretches out to the door while there are hardly any customers at the 'PNG kaikai' serving area. People vote with their feet (20). To change people's behaviour might sound daunting. However, reports from Mauritius show that health behaviour and risk factor status can be modified – sometimes with legislative help (21). These preventive behavioural changes also affect a range of other lifestyle conditions that come with modernization. Papua New Guinea should **adopt** and **practise** this healthy lifestyle now.

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