



NON-INSULIN DEPENDENT DIABETES MELLITUS IN PACIFIC
POPULATIONS - A MAJOR PUBLIC HEALTH PROBLEM

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SUMMARY

The publications submitted in this thesis attempt to cover the contribution of the author to the study of the epidemiology of non-insulin dependent diabetes mellitus (NIDDM) in a progressive manner. The Pacific region provides a unique natural situation for the study of genetic and environmental determinants of NIDDM. These studies have provided new insights into the aetiology of NIDDM that could not be provided easily by studies in Australia or elsewhere due to the genetic and environmental diversity of the different populations available.

All of the studies have been published in refereed international scientific journals, and review papers (from named lectures or by invitation from scientific journals) have been included to place the studies in a global scientific context.

From these studies, the following facts emerged regarding diabetes mellitus in Pacific populations

- ° Diabetes is almost exclusively of the NIDDM type.
- ° A wide range of prevalence exists ranging from <2% in rural Melanesians (Fiji and New Caledonia) to 24% in the affluent Micronesian population of Nauru. While Micronesians and Polynesians have an increased genetic susceptibility to NIDDM, Melanesians may possess a genetic protection.

- Diabetes prevalence is much lower in traditional living compared to urbanized communities of the same ethnic group.
- The prevalence and incidence of NIDDM in Nauru are the equal highest yet recorded in the literature.
- Even within countries, there are major differences in prevalence between ethnic groups (e.g. in Fiji, prevalence is almost 4 times higher in urban Indian males compared with Melanesians).
- Cross-sectional studies have shown pronounced heterogeneity of behavioural, environmental and social risk factors for NIDDM eg physical inactivity, obesity and modernization.
- Hyperinsulinaemia, a hallmark of insulin resistance, is present in the high prevalence Micronesian population of Nauru. Its presence predates NIDDM and is predictive of its development.
- Microvascular complications are common with similar risk factors as in other populations ie duration of diabetes and degree of hyperglycaemia.
- There are considerable morbidity and excess premature mortality from NIDDM in Nauru, and a 4-fold increase in risk of mortality in diabetics compared with subjects with normal glucose tolerance.
- Certain ethnic groups (Micronesians, Polynesians and Asian Indians) appear to have an increased genetic susceptibility to NIDDM. The behavioural, environmental and social risk factors that unmask this genetic propensity show heterogeneity within and between populations.

Thus, the emerging pattern in the Pacific is that in association with modernization of lifestyle - either in situ or as a result of migration - NIDDM is emerging along with other non-communicable diseases as major health problems. In addition, there appears to be a gradient of susceptibility to NIDDM between different ethnic groups living in the same country.

Studies such as those described in this thesis have important implications for public health strategies for prevention of noncommunicable diseases including NIDDM in both developing and developed nations.

The identification of genetic markers to determine "high risk" subjects, and the elucidation of the behavioural, environmental and social risk factors for NIDDM can provide the basis for the planning of community intervention programs for a disease which is now emerging as one of the major health problems in Pacific and other developing nations.