ABSTRACT SERVICE

DIAGNOSIS :

Randon blood glucose as a screening test for diabetes in a biethnic population.

Simmons D. Williams DR. Diabet Med 1994; 11 : 830-5.

Screening asymptomatic subjects for diabetes is often undertaken using a random capillary whole blood sample for glucose estimation. The test characteristics of this method for screening were assessed using a glucose oxidase method among 3,425 Europeans and 3,469 South Asians who gave such a sample during the Coventry Diabetes Study, a house-to-house diabetes prevalence study. Glucose tolerance tests were performed on those with a high blood glucose and 10% of others. Previously undiagnosed diabetes was found in 73 Europeans and 110 South Asians. If the random glucose was > or=7.0 mmol 1-1, 8.0% of Europeans and 6.7% of South Asians would need a further diagnostic test and the sensitivity of this cut-off was 51.7 (95.0% CI: 43.5-59.9)% in Europeans and 68.4 (60.6-76.2)% in South Asians. Sensitivity was increased in South Asians but not among Europeans by defining the time since last meal (South Asians < 2hr.:83.9 (72.3-92.0); > or = 2hr : 54.9 (42.7-66.8)%. Sensitivity was poorest among Europeans ages > or = 65 years 40-64 years 69.0 (49.2-84.7)%, > or=65 years 49.4 (38.2-60.6)%. Screening asymptomatyic individuals using an isolated capillary random whole blood glucose measure is a poor test for diabetes, although slight improvement can be obtained among South Asians by testing within 2 hr of a meal.

Fasting plasma glucose in the diagnosis of diabetes mellitus: a study from southern India.

Ramchandran A, Snehalatha C, Vijay V, Vishwanathan M. Diabet Med 1993; 10 : 811-3.

The usefulness of fasting plasma glucose(FPG) in the diagnosis of diabetes mellitus was assessed in Asian Indians in South India. Oral GTT values in 570 newly screened adults were studied. Taking the WHO criteria of 2 hr plasma glucose (PG) of >or = 11.1 mmol 1-1 for diagnosis of diabetes, the validity of a FPG of > or=7.8 mmol 1-1 cut off value for diabetes was assessed. Using the regression analysis, the correlations of the FPG to 2 hr PG were examined. Among the 268 with 2 hr PG value of > or = 11.1 mmol 1-1, 205 (76.5%) had FPG > = 7.8 mmol 1-1. Sensivity of FPG was 76.5% for diagnosis of diabetes and its specificity was 99%. An exponential regression model gave the best fit for FPG vs 2 hr PG and using the regression equation, the predicted FPG for a 2 hr PG of 11.1 mmol 1-1 was 7.05 mmol 1-1. Sensitivity increased to 90.3% with FPG of 7.05 mmol 1-1 while the specificity remained at 92%. It is concluded that in the south Indian subjects, the sensitivity for diagnosis of diabetes with FPG of > or = 7.8 mmol 1-1 was 76.5%; and increased to 90.3% with FPG of > or = 7.05 mmol 1-1.

EPIDEMIOLOGY

Diabetes and impaired glucose tolerance in three American Indian populations aged 45-74 years. The Strong Heart Study.

Lee ET, Howard BV, Savage PJ, Cowan LD, Fabsitz RR, Oopik AJ, Yeh J, Go O, Robbins DC, Welty TK. Diabetes Care 1995 : 18 : 599-610.

OBJECTIVE -- To estimate the prevalence rates of diabetes and impaired glucose tolerance (IGT) in three American Indian populations, using standardised diagnostic criteria, and to assess the association of diabetes with the following selected possible risk factors: age, Obesity, family history of diabetes and amount of Indian ancestry.

RESEARCH DESIGN AND METHODS - This cross-sectional study involved enrolled members, men and women aged 45-74 years, of 13 American Indian tribes or communities in Arizona, Oklahoma and South and North Dakota. Eligible participants were invited to the clinic for a personal interview and physical examination. Diabetes and IGT status were defined by the World Health Organisation criteria and were based on fasting plasma glucose and oral glucose tolerance test results. Data on age, family history of diabetes and amount of Indian ancestry were obtained from the personal interview and measures of obesity included body mass index, percentage body fat and waist-to-hip ratio.

RESULTS A total of 4,549 eligibl4e participants were examined and diabetes status was determined for 4,304 (1,446 in Arizona, 1,449 in Oklahoma and 1,409 in the Dakotas). In all three centers, diabetes was more prevalent in women than in men. Arizona had the highest age-adjusted rates of diabetes : 65% in men and 72% in women. Diabetes rate in Oklahoma (38% in men and 42% in women) and South and North Dakota (33% in men and 40% in women), although considerably lower than in Arizona, were several times higher than those reported for the U.S. population. Rates of IGT among the three populations (14-17%) were similar to those in the U.S. population. Diabetes rates were positively associated with age, level of obesity, amount of Indian ancestry and parental diabetes status.

CONCLUSIONS -- Diabetes is found in epidemic proportions in Native America populations. Prevention programs and periodic screening should be implemented among American Indians. Standards of care and intervention have been developed by the Indian Health Service for individuals in whom diabetes is diagnosed. These programs should be expanded to include those with IGT to improve glycaemic control or to reduce the risk of development of diabetes as well as to reduce the risk of diabetic complications.

The frequency of known diabetes, hypertension and ischaemic heart disease in affluent and poor urban populations of Karachi, Pakistan.

Hameed K; Kadir M, Gibson T, Sultana S, Fatima Z, Syed A. Diabet Med. 1995 12 : 500=3.

The high frequency of diabetes mellitus and coronary artery disease among people of South Asian extraction living in the West is well established. The prevalence of these disorders in Southern Asia is less certain. No previous attempt has been made to estimate their occurrence in Pakistan. In order to compare the prevalence of known diabetes mellitus, hypertension and ischaemic heart disease between affluent and poor urban communities in Pakistan, a survey of consecutive

households was undertaken in a relatively prosperous and a poor area in Karachi. Information was obtained on 4232 adults evenly distributed between the two areas. Body weight and height were measured in 199 healthy subjects at the two sites. The prevalence of known diabetes in affluent population was 4.5%, significantly higher than 1.8% in the poor area (P < 0.001). A maximal prevalence of 25% was seen in the affluent community aged 55-64. Diabetes was more common in females in both populations. The overall prevalence of hypertension was similar in the two areas although significantly more frequent in the middle aged and affluent. A history of ischaemic heart disease occurred in 1.9% of the affluent and 0.6% of the poor (P = 0.003). Healthy subjects were heavier and more obese in the richer community. Thus the susceptibility of South Asian populations to diabetes and ischaemic heart disease is also apparent in an affluent segment to Pakistani society. The phenomenon is not attributable simply to urbanisation. Obesity is probably an important contributory factor. The economic implications for developing South Asian countries are serious.

Impaired glucose tolerance and diabetes mellitus in a rural population in south India.

Patandin S, Bots ML, Abel R, Valkenburg HA. Diabetes Res Clin Pract. 1994; 24 : 47-53.

In the present study the prevalence of impaired glucose tolerance and non-insulin dependent diabetes mellitus in a rural population in South India was assessed and its associations with body mass index and a family history of diabetes mellitus. Data were obtained from inhabitants of two villages located in the North Arcot District of Tamil Nadu. After an overnight fast, 467 randomly selected subjects, aged 40 years and over, were given 75 g glucose orally. After two hours the capillary glucose level was determined. The prevalence of impaired glucose tolerance (2 hr value > = 7.8 mmol/l and < 11.1 mmol/l) was 6.6% (31 subjects). Non-insulin dependent diabetes mellitus (2 hr value > or = 11..1 mmol/l) was found in 23 subjects (4.9%). Of these, 53% were previously unknown. Age and sex adjjusted mean body mass index was significantly higher among subjects with impaired glucose tolerance compared to subjects without glucose intolerance, with a mean difference of 1.4 kg/m^2 (95% confidence interval (CI) 0.2, 2.6). ± positive family history of diabetes was non-significantly higher in subjects with impaired glucose tolerance. Subjects with non-insulin-dependent diabetes mellitus had a higher mean body mass index compared to subjects with normal glucose levels with a mean difference of 1.9 kg/m^2 (95% CI 0.5, 3.3). ± positive family history of diabetes was more common among diabetics with a difference of 20% (95% CI 10,30). Our findings suggest that in a considerable proportion (11.5%) of the rural South Indian population aged 40 or over glucose intolerance in present.

UK Prospective Diabetes Study. XII: Differences between Asian, Afro-caribbean and white Caucasian Type 2 diabetic patients at a diagnosis of diabetes. UK Prospective Diabetes Study Group.

Diabet Med. 1994, 11 : 670-7.

Clinical and biochemical variables and prevalence of complications at diagnosis of diabetes were assessed in 5098 Type 2 diabetic patients in UK Prospective Diabetes Study of whom 82% were White Caucasian, 10% Asian of Indian origin and 8% Afro-Carribbean. The Asian patients were (P < 0.001) younger (mean age 52.3, 47.0, 51.0 years), less obese (BMI 29.3, 26.7, 27.9 kg m^{-2}), had a greater waist-hip ratio, lower blood pressure (systolic 145, 139, 144, diastolic 87,86,89 mmHg) and prevalence of hypertension. They were more often sedentary (19, 39, 15%) more often obstained from alcohol (21,55,25%) and had a greater prevalence of first degree relatives with known diabetes (36, 44, 34%). The Afro-Caribbean patients had (P <0.001) higher fasting plasma glucose (11.9, 11.3, 12.5mmol 1-1), more severely impaired beta-cell function (45,35,28% normal) and less impaired insulin sensitivity (23, 19, 27% normal) by homoeostasis model assessment, lower triglyceride (1.8, 1.8, 1.3 mmol 1-1), and higher HDL-cholesterol (1.05, 1.03, 1.17 mmol 1-1). Prevalence of a history of myocardial infarction, stroke or intermittent claudication at a diagnosis was similar. The prevalence of ischaemic ECG (Minnesota code), microalbuminuria (urine albumin > 50 mg 1-1), ratinopathy ('191' grading of rential photographs) and neuropathy (abnormal vibration perception threshold or absent leg reflexes) was also similar. At diagnosis of Type 2 diabetes there were no differences in prevalence of complications between White Caucasian, Asian and Afro-Carribbean patients although differences were found in other clinical and biochemical variables.

Childhood-onset diabetes in Whites and South Asian population in Leicestershire, UK.

Gujral JS, McNally PG, Botha JL, Burden Ac. Diabet Med. 1994; 11 : 570-2.

The prevalence of childhood-onset Type 1 diabetes mellitus is important for determining health care provision. In Leicestershire 13.5% of the childhood population (0-14 years) is of South Asian origin (census 1991). This study determined the prevalence of Type 1 diabetes in Whites and South Asians in Leicestershire, using a capture/recapture method to coincide with the 1991 census day. Children, (0-14 years) with Type 1 diabetes were captured from the central diabetic register. The health visitor and consultant records were used to recapture the cases. Total ascertainment of cases was 95-100. The prevalence of Type 1 diabetes in White children, (107 cases) was 0.75/1000 children (95% CI 61-0.89) compared with the South Asian prevalence (18 cases) of 0.77/1000 (95%CI 0.41-1.13). The overall prevalence in White males was 0.82/1000 (0.61-1.03) compared with 0.68/1000 (0.48-0.87) in females. In South Asian males it was 0.59/1000 (0.15-1.03) compared with 0.96/1000 (0.39-1.53) in females. The prevalence of Type 1 diabetes in children of South Asian migrants to the United Kingdom cannot be said top be different from White children.

CLINICAL FEATURES

Height at onset of insulin-dependent diabetes in children in southern India.

Ramchandran A, Snehalatha C, Joseph TA, Vijay V, Vishwanathan M. Diabetes Res Clin Pract. 1994; 23: 55-7.

A total of 250 children with insulin-dependent diabetes mellitus (IDDM), having age at onset of diabetes < or = 18 years were studied. Their height at onset of diabetes was compared with that of the normal age and sex-matched control

population. No differences were observed in the heights of the two groups of children. Therefore, our results were similar to these found in Japan and differed from the reports in European children with IDDM in whom an increased growth velocity was noted before the onset of IDDM>

Delayed onset of diabetes in children of low economic stratum – a study from southern Indian.

Ramchandran A, Snehalatha C, Joseph TA, Vijay V, Vishwanathan M. Diabetes Res Clin Pract. 1994;22:171-4.

Influence of the socioeconomic status on the age at onset of insulin-dependent diabetes mellitus (IDDM) was analysed in 614 patients who developed diabetes < or = 20 years. The peak occurrence was seen at 11 years in girls (n = 293). The boys (n = 321) showed multiple peaks between 11 and 18 years. In the urban patients (n = 463), the peak was at 11 years in contrast to a delayed peak at 18 years in the rural group (n = 151). When analysed with respect to family income, the higher income group (HIG) (Rs. > 2000/month) showed a sharp peak at 11 years whereas the lower income group (LIG) showed a peak at 18 years (chi 2 = 7.2, P = 0.007). The median body weight of the LIG was low compared to the LIG. Although the exact cause for the delayed age at onset of IDDM in the rural of LIG is not known, it is likely to be a consequences of the lower socio-economic and nutritional status (indicated by low body weight) and probably indicates the influence of environmental factors in the pathogenesis of the disease.

Fibrocalculous pancreatic diabetes in Pune, India. Clinical features and follow-up for 7 yr.

Yajnik CS, Shelgikar KM. Diabetes Care 1993; 16: 916-21.

OBJECTIVE – To study clinical features of fibrocalculous pancreatic diabetes from this clinic, to compare these with the published criteria of malnutrition-related diabetes mellitus and to conduct serial follow-up of these patients to study difficulties in their treatment.

RESEARCH AND DESIGN AND METHODS – Details of presenting symptoms, anthropometry, diabetic tissue damage, treatment and follow-up of 55 patients with tibrocalculous pancreatic diabetes (pancreatic calculi demonstrated on X-ray and sonography) treated during the last 7 yr were studied.

RESULTS – Many patients did not fit the accepted criteria of malnutrition-related diabetes. Thus, 17 (31%) were diagnosed after 30 yr of age and 23 (42%) had a body mass index > 18 kg/m^2 and the daily does of insulin in these patients (mean 0.8 U/ kg) was similar to that in the IDDM patients (mean 1.0 U/kg). The two pathognomonic complaints (pancreatic pain and steatorhea) were not always present. Many patients took very irregular treatment, but none suffered from diabetic ketoacidosis despite stopping insulin for long periods of time; 33% of patients had some diabetic tissue damage when first seen. Fourteen patients were lost to follow-up and 11 died during the follow-up.

CONCLUSIONS-- Clinical features of these fibrocalculous pancreatic diabetes patients were somewhat different than the classic description. A need exists to reconsider classification of FCPD under malnutrition-related diabetes mellitus. Many patients received irregular treatment and a substantial proportion died within a few years of diagnosis, many as a result of preventable causes.

PATHOGENESIS

HLA, ESD, GLOI, C3 and HP ploymorphisms and juvenile insulin dependent diabetes mellitus in Tamil Nadu (South India).

Subramanian VS, Krishnaswami CV, Damodaran C. Diabetes Res Clin Pract 1994 ; 25: 51-9.

Fifty juvenile insulin dependent diabetes mellitus (JIDDM) patients of Tamil Nadu (South India) were typed for HLA-± , -B, -C, -DR and _DQ, ESD,GLOL,C3 and HP ploymorphisms. The frequencies of B8, DR3, DR4, DR53 and DQ2 antigens of the HLA system were significantly higher in the patients than in controls (relative risk, RR = 4.81; 5.14 : 3.98; 3.36 and 2.53, respectively). However HLA-DR2, -DR5 and –DQ1, observed less frequently in the patient group, appear to play a role of protection against the disease (RR = 0.32 ; 0.30 and 0.20 respectively). HLA haplotype analysis demonstrated very high relative risk associated with two hitherto unreported haplotypes namely A3, DR1 and Cw3, DR4 (PR = 27.30 and 20.00, respectively) and also scanty distribution of the haplotypes A1, B17 and DR2 DQ! (RR = 0.39 and 0.36, respectively) in the patient group. Among other genetic markers tested. GLOI is informative with its phenotype GLOI 2-1 showing positive association with JIDDM (RR = 4.06).

Differing frequency of autoantibodies to glutamic acid decarboxylase among Koreans, Thais and Australians with diabetes mellitus.

Tuomi T, Zimmet P, Rowley MJ, Min Mk, Vichayanrat A, Lee HK, Rhee BD, Vannasaeng S, Humphrey AR, Mackay IR, Clin Immunol Immunopathol. 1995 ; 74: 202-6.

The wide racial-geographic differences in the incidence and prevalence of insulin-dependent diabetes mellitus (IDDM) between Europids and Asian populations prompted us to compare frequencies of positivity of autoantibody to glutamic acid decarboxylase (GAD). Thpatients with IDDM included 41 Koreans, 30 Thais and 45 Australian Europids;The Koreans included 14 cases regarded as atypical IDDM by reason of a delayed requirement for insulin treatment. Autoantibodies were measured by radiommunoprecipitation using iodinated purified porcine brain GAD. The frequency of positive tests for anti-GAD of 30% (8/27) for Koreans and 51% (20/30) for Thais was significantly lower than the 84% (38/45) for Australian Europids, even after stratifying by age of onset. Correspondingly, the mean levels of anti-GAD among seropositive cases were significantly lower for Koreans than for Australian Europids. In contrast to Thais and Australians, more than half the Korean were diagnosed at age >20 years, but there was no significant difference in positivity for anti-GAD between those over or under the age of 20 at diagnosis. The different frequency of positivity in tests for anti-GAD among Koreans, Thais and Australian Europids with IDDM suggests that there is a greater etiologic heterogeneity of IDDM among Asian than Europid populations, in whom autoimmune destruction of pancreatic islets predominates.

The ethnic distribution of antibodies to glutamic acid decarboxylase: presence and levels of insulin-dependent diabetes mellitus in Europid and Asian subjects.

Zimmet PZ, Rowley MJJ, Mackay IR, Knowles WJ, Chen QY, Chapman LH, Serjeantson SW. J Diabetes Complications 1993; 7 : 1-7.

Our objective was to ascertain the frequency of antibodies to gultamic acid decarboxylase (GAD), in Europids and four Asian ethnic groups with insulin-dependent diabetes mellitus (IDDM) to gain insight into why the prevalence and incidence of IDDM varies so widely among ethnic d/or geographically diverse population groups. The subjects in this study were Europid (n = 49), Japanese (n = 16), Korean (n = 21), and Chinese (n = 13) persons with IDDM with a duration ranging from 5 to 14 years. There were similar numbers of healthy controls matched for each ethnic group. A validated radioimmunoprecipitation assay used GAD from pig brain radiolabeled with 1251 using chloramine T. Islet cell cytoplasmic antibodies measured by indirect immunoflourescence were expressed as Juvenile Diabetes Foundation units. The prevalence of antibodies to GAD, compared with Europids (63%), was much lower in all Asian populations with IDDM: Japanese (31%), Thai (29%), Korean (5%) and Chinese (27%). The mean level of antibodies of GAD, however, among diabetics from each population who gave a positive reaction, was similar. For all groups, the prevalence of antibodies to GAD was much higher than that of islet cell cytopasmic antibodies. Almost all IDDM subjects positive for islet cell antibodies had antibodies to GAD, but the converse did not hold. A adioimmunoprecipitation assay for antibodies to GAD applied to serum from subejcts with IDDM in various ethnic groups showed that Europids with IDDM had a much higher prevalence of such antibodies than did Asians. This held for all ethnic groups and particularly Koreans. Thus, among different populations, there may be etiologic heterogeneity of IDDM.

Genetic analysis of glucokinase and the chromosome 20 diabetes susceptibility locus in families with Type 2 diabetes.

Dow E, Gelding SV, Skinner E, Hewitt JJE, Gray IP, Mather H, Williamson R, Johnson DG. Diabet Med 1994; 11: 856-61.

Mutations of the glucokinase gene (chromosome 7p) have been shown to cause some cases of familiar maturity onset diabetes of youth (MODY) but few, if any, cases of late onset familiar Type 2 diabetes. A further single large pedigree with MODY has shown linkage to a market for the adenosine deaminase gene (ADA, chromosome 20 q), although the diabetes susceptibility gene at this locus has not been identified. We have studied members of 19 families with familiar Type 2 diabetes (includes 10 European families, 6 families from the India subcontinet and 3 families of Adro-Caribbean origin), 2 of which were of MODY type (and both European), with a glucokinase market and a market linked to ADA, to examine whether glucokinase, or the unknown defect on chromosome 20, are implicated in diabetes in our pedigrees. Several models were constructed for standard two-point linkage analysis. Glucokinase is not the cause of diabetes in all of these families but was excluded in only one MODY family., It was possible to exclude both loci in the second MODY predegree. No evidence was found of linkage to either market in this multi-ethnic population under the models used. At least one further locus is involved in determined susceptibility.

Increased secretion of 32,33 split proinsulin after intravenous glucose in glucose-tolerance first-degree relatives of patients with non-insulin dependent diabetes of European, but not Asian, origin.

Gelding SV, Andres C, Niththyananthan R, Gray IP, Mather H, Johnston DG. Clin Endocrinol Oxf 1995 ; 42: 255-64.

OBJJECTIVE – The etiology of non-insulin dependent diabetes is unknown, but defective insulin secretion is a feature. The disease also has a strong genetic basis and first-degree relatives of patients have an increased risk of future diabetes. To investigate whether beat-cell dysfunction is an early feature of the disease, we studied insulin secretion in healthy first-degree relatives of patients with non-insulin dependent diabetes.

DESIGN – Each subject underwent a 1 hr. intravenous glucose tolerance test (0.3g/kg).

PATIENTS -- Seventeen first-degree relatives of patients [10 of European and 7 of Asian (Indian subcontinent) origin] with normal glucose tolerance were compared with 17 matched control subjects with no family history of diabetes.

MEASUREMENTS : Plasma immunoreactive insulin (IRI) was measured by radioimmunoassy and specific insulin, intact and 32,33 split proinsulin were measured by specific immunoradiometric assays (IRMA) for the 1st phase (0-10 minutes) and 2nd phase (10-60 minutes) response. Glucose and intermediary metabolities were measured enzsymatically.

RESULTS –Fasting concentrations of IRI, IRMA insulin, intact 32,33 split proinsulin were similar in relatives and controls in each group. Fasting glucose levels were similar in European relatives and controls but lower in Asian relatives compared to their controls (mean ± SE 4.9 ± 0.2 vs 5.5 ± 0.2 mmol/l, $P < 0.05$). Following intravenous glucose, European relatives had similar IRI and glucose levels to their controls. Secretion of 32, 33 split proinsulin was increased in European relatives compared of their controls, significantly so for 2nd phase secretion (1st phase median range) : 71 (7-352) vs 55 (17-118) pmol/lmin,NS; 2nd phase : 433 (155-1459) vs 234 (55-745) pmol/lmin, $P < 0.05$). Secretion of IRMA insulin and intact proinsulin were insulin in European relatives and controls (IRMA insulin : 1st phase 2757 (700-10,969) vs 2830 (632-4682) pmol/lmin; 2nd phase 6387 (3006-15,865) vs 5284 (2060-18, 605) pmol/lmin; intact proinaulin : 1st phase 31 (13-113) vs 32 (16-72) pmol/lmin; 2nd phase : 174 (87-737) vs 159 (97-298) pmol/lmin). European relatives had a greater percentage of proinsulin-like molecules (intact + 32,33 split proinsulin) to total insulin (sum of IRMA insulin + intact + 32, 33 spl;it proinsulin) during the 2nd phase of secretion [9.1 (5.0-11.8) vs 5.9 (4.3-12.6)%, $P < 0.05$]. In contrast, Asian relatives had similar secretion of IRI, IRMA insulin, intact and 32, 33 split proinsulin to their controls. Glucose disappearance (KG) was similar in relative and controls within each ethnic group (Europeans: relatives 725 ± 101 vs controls 668 ± 47/ min ; Asian : relative 610 ± 97 vs controls 783 ± 936/min. Asian relatives had higher fasting circulating glycerol (65± 7 vs 44 ± 4 mumol/l $P< 0.05$), non-esterified fatty acid (569 ± 59 vs 375 ± 64 mumol/l, $P < 0.05$), and 3-hydroxybutyrate keveks 147 (44-187) vs 35 (21-57)mumol/l $P<0.01$) than their controls and this persisted following intravenous glucose. This difference was not observed in the European group.

CONCLUSION -- First-degree relatives of European patients with NIDDM possess early signs of beta-cell dysfunction with increased and disproportionate secretion of 32, 33 split proinsulin after intravenous glucose, whilst glucose tolerance is still normal.

Positive association in the absence of linkage suggests a minor role for the glucokinase gene in the pathogenesis of Type 2 (non-insulin-dependent) diabetes mellitus amongst south Indians.

McCarthy MI, Hitchins M, Hitman GA, Cassell P, Hawrami K, Morton N, Mohan V, Ramchandran, A , Snehalatha C, Vishwanathan M. Diabetologia 1993; 36: 633-41.

Mutations of the glucokinase gene have been implicated in the development of glucose intolerance in pedigrees with maturity-onset diabetes of the young. However, the contribution of the glucokinase gene to the aetiology of common Type 2 (non-insullin-dependent) diabetes mellitus is uncertain. We have studied the role of the glucokinase gene in the pathogenesis of Type 2 diabetes in South Indians, using both population-association and linkage methodology. ± pair of CA-repeat sequences (GCK(3') and GCK (5') staddling the glucokinase gene were employed as markers, each subject being typed using the ploymerase chain reaction and ployacrylamide gel electrophoresis. Comparisons of allele frequencies at these markers were made between 168 Type 2 diabetic subjects and 70 racially-matched control subjects. No differences in allele frequencies were apparent at the GCK (5') marker; however, there were significant difference in allele frequencies at the GCK (3') marker between the Type 2 diabetic subjects and control subjects (chi 2 =11.6, dg =-3, P= 0.009) with an increase of the z allele (78.0% vs 66.4%) and a decrease of the z + 2 allele (13.7% vs 25.0%) amongst the diabetic subjects. Linkage between glucose intolerance and the glucokinase gene was studied in 53 nuclear pedigress under a variety of genetic models. Linkage was excluded (Iod score < - 2) at a recombination fraction of zero under five of the ten models used and highly unlikely (-2 < lod score < -1) under the others. The combination of positive association and negative linkage suggests that glucokinase acts as a minor gene influencing the development of Type 2 diabetes within this population.

Family studies of non-insulin-dependent diabetes mellitus in South Indians.

McCarthy MI, Mitman GA, Shields DC, Morton NE, Snehalatha C, Mohan V, Ramchandran A, Vishwanathan M, Diabetologia. 1994 ; 37 : 1221-30.

Though a genetic basis for non-insulin-dependent diabetes mellitus (NIDDM) is clear, the likely mode of inheritance is not known. The segregation of NIDDM was studied in 64 nuclear South Indian pedigress (449 individuals) ascertained through an affected proband having both parents and more than 1 sibling alive and available for oral glucose tolerance testing. A high proportion of parents were found to be of abnormal glucose tolerance [89 of 128 (70%) diabetic and 11 of 128 (9%) impaired]. Complex segregation analysis was performed using (1) POINTER which implements the mixed model and distinguishes majjor gene, multifactorial and non-transmitted environmental contributions to affections and (2) COMDS which implements and oligogenic model with major gene, modifier gene and environmental contributions to (a) affection and (b) diathesis (an ordered polychotomy amongst non-affected family members, based on 2-hr plasma glucose level). Using POINTER, there was no formal support for a major gene and the most parsimonious solutions were achieved with multifactorial models. Using COMDS, we found it) significant improvements in models when information on glucose levels in nondiabetic family members (diathesis) was included, ii) support for segregation of diallelic gene as well as background familiar resemblance, and iii) under the best-supported model, this diallelic locus featured incomplete dominance (d = 0.8) and a disease-presisposing allele frequency of 14% In South Indians, segregation of NIDDM is inadequately described by simple major gene models: more complex models provide more satisfactory descriptions. This finding, if applicable in other populations, has important implications for the search for diabetes-susceptibility genes.

Insulin resistance, high prevalence of diabetes, and cardiovascular risk in immigrant Asians, Genetic or environmental effect?

Dhawan J, Bray CL, Warburton R, Ghambhir DS, Morris J. Br Heart J 1994 ; 72: 413-21.

OBJECTIVES -- To compare the prevalence of diabetes, hyperinsulinaemia and associated metabolic abnormalities in immigrant Asians, Asians in India and native White British men.

DESIGN – Case control study.

SETTING—Wythenshawe Hospital, Manchester, United Kingdom and Maulana Azad Medical School, New Delhi, India.

SUBJECTS—Men with angiographically proved coronary artery disease; 83 British Asians, 87 White men and 30 Indian Asians with age matched controls.

INTERVENTIONS – Fasting lipid concentrations, serum glucose and total insulin concentrations were measured in the fasting state and one and two hours after a 75 g glucose load by mouth. All subjects had a physical examination by the same observer.

RESULTS – Asians in the United Kingdom and in India had a higher prevalence of diabetes and impaired glucose tolerance than White British men. Patients in all three ethnic groups had higher total insulin concentrations than their controls in the fasting state and after the glucose load. British Asian and Indian Asian patients and controls had higher total insulin concentrations than the White men in the fasting state and after the glucose load. Total insulin concentrations were similar in British and Indian Asians, though fasting concentrations were higher in British Asians than Indian Asians. With men had similar cholesterol, lower triglyceride and higher high density lipoprotein cholesterol concentrations than Asians in the United Kingdom and in India. British Asian patients had higher cholesterol concentrations than the Indians Asian groups. Asian patients and controls were more active. British and Indian Asian patients had higher waist to hip ratios than controls. The waist to hip ratio was positively correlated with insulin and triglyceride concentrations and negatively correlated with the high density lipoprotein cholesterol concentration. Fasting insulin and high density lipoprotein

concentration were independent predictors of coronary artery disease in White men, whereas in British Asians the waist to hip ratio was the strongest independent predictor. In Indian Asians the waist to hip ratio and high density lipoprotein concentration were independent predictors of coronary artery disease.

CONCLUSIONS – Central obesity in the subgroups of Asians studied, showed a close association with hyperinsulinaemia and the risk of coronary artery disease. ± predisposition to insulin resistance and its metabolic abnormalities in this group of Asians seems to be genetically determined, environmental changes after migration having only a small additional effect.

Exocrine pancreatic and beta-cell function in malnutrition-related diabetes among north Indians.

Bhatia E, Baijal SS, Kumar KR, Choudhuri G. Diabetes Care 1995; 18: 1174 –8.

OBJECTIVE - To compare the pancreatic exocrine and beta-cell function in the two variants of malnutrition-related diabetes mellitus (MRDM): fibrocalculous pancreatic diabetes (FCPD) and protein-deficient pancreatic diabetes (PDPD).

RESEARCH DESIGN AND METHODS – Fecal chymotrypsin (FCT) and fasting C-peptide levels were measured in 20 consecutive patients with FCPD and 19 with PDPD. FCPD was diagnosed by pancreatic calcification on ultrasonography, while the diaygnosis of PDPD was made on the basis of low body mass index, severe diabetes requiring insulin therapy and ketosis resistance on interruption of insulin. Twenty patients with Type 1 diabetes and 32 healthy subjects served as control subject .

RESULTS – Both FCPD and PDPD patients had diminished levels of FCT when compared with those control subjects and patients with Type 1 diabetes. However, FCT levels were significantly lower in subjects with FCPD (median 0 .4 U/g, range 0-8.9 U/g), in comparison with those with PDPD (4.7 U/g, 0.6-40.5 U/g; P< 0.001). Of the FCPD patients, 13 of 20 (65%) had severe exocrine pancreatic deficiency (FCT < 1U/g) vs.. 3 of 19 (15.8%) PDPD subjects (P< 0.001). In comparison with control subjects, fasting serum C-peptide levels were significantly diminished in both MRDM groups. However C-peptide levels in the subjects with FCPD (mean ± SE, 0.22 ± 0.04 nmol/l) and PDPD (0.26 ± 0.04 nmol/l) were comparable.

CONCLUSIONS – Among the two variants of MRDM, subjects with FCPD have severe pancreatic exocrine deficiency in comparison with those with PDPD, even though their C-peptide levels are comparably diminished. This suggests that the pathogenesis of these two entities may differ or that the genetic and/or environmental factors leading to exocrine damage are different.

DIABETES AND PREGNANCY

Why do Asian-born women have a higher incidence of gestational diabetes? An analysis of racial differences in body habitus, lipid metabolism and the serum insulin response to an oral glucose load.

Shelly Jones DC, Wein P, Nolan C, Beischer NA . Aust N Z J Obstet Gynaecpl. 1993 ; 33 : 114-8.

We have observed a higher incidence of gestational diabetes (GDM) in Asian-born than in Caucasian women. Body habitus, serum lipid levels and the serum insulin response to a glucose load in pregnancy were compared in 15 women with normal glucose tolerance. 16 Caucasian women with GDM and 19 Asian born women with GDM, unlike Asian-born women with GDM, were obese compared with controls as measured by body mass index (P = 0.022). Both groups of GDM women had similar patterns of insulin response to oral glucose with delayed insulin peak and an elevated 2hr-hour insulin level (P = 0.0021). In addition, the insulin response per unit of glycaemic stimulus (incremental insulin area/incremental glucose area at 1 hour) was reduced in both GDM groups (P = 0.035). Fasting serum triglyceride levels were higher in women with GDM although this was only significant in the Caucasian group (P = 0.014). Asian-born women with GDM had significantly lower (P = 0.041) serum cholesterol levels than Caucasian women with GDM. There was a significant correlation (P = 0.025) between glucose tolerance (area under the curve and fasting serum triglyceride values. The relationship between lipid and carbohydrate metabolism in Asian-born and Caucasian women in pregnancy requires further investigation.

Difference in prevalence of gestational diabetes and perinatal outcome in an innercity multiethnic London population.

Koukkou E, Taub N, Jackson P, Metcalfe G, Cameron M, Lowy C. Eur J Obstet Gynecol Reprod Biol. 1995 ; 59 : 153-7.

In order to establish the prevalence of gestational diabetes mellitus (GDM) among ethnic groups residing in the catchment area of one hospital in central London and to assess both mode of delivery and the baby outcome, we studied retrospectively 703 women selected for screening for GDM during the years 1991 and 1992. While the prevalance of GDM was approximately 2% overall, within the ethnic groups a significant difference was found with Asian and Africans/Afrocaribbeans being four and two times more likely to have GDM, respectively, than Caucasians (P < 0.001). Both maternal obesity and the diagnosis of GDM influenced and the time and the mode of delivery, but perinatal mortality and morbidity did not differ significantly between women with GDM and women with normal glucose tolerance. An association between the GTT glucose area and the gestational age and ethnicity adjusted birth weight was observed in women with normal glucose tolerance test, but was absent in the GDM pregnancies, providing indirect evidence that dietary treatment, with or without insulin treatment, altered the maternal milieu in the latter sufficiently to modify fetal growth.

Prevalence of diabetes in pregnant women – a study from southern India.

Ramchandran A, Snehalatha C, Shyamala P, Vijay V, Viswananthan M. Diabetes Res Clin Pract. 1994 ; 25: 71.4.

This study was carried out to assess the prevalence of diabetes in southern Indian women during pregnancy. Nine hundred and fifty women having > or = 24 weeks of gestation, attending two general gynecology centres, for antenatal check-ups were screened. Initially, the screening test with 1-hr plasma glucose sampling following 50 g glucose load was done and those with glucose values > or = 140mg/dl were

subjected to 3-hr oral glucose tolerance test (OGTT) with 100 g glucose load. Among the 950 women, 6 were known diabetic subjects. Of the other 944, 89 were positive on screening test and 67 of them reported for OGTT. Four were detected to have gestational diabetes mellitus (GDM) (O'Sullivan and Mahan's criteria). Therefore the prevalence of total diabetes and GDM were 1.19% and 0.56%, respectively.

Diabetes in pregnancy in Pakistani women: prevalence and complications in an indigenous south Asian community.

Ahkter J, Quershi R, Rahim F, Moosvi S, Rehman A, Jabbar A, Islam N, Khan MA. Diabet Med. 1996 ; 13 : 189-91.

The aim of this study was to determine the prevalence and complications as well as to correlate maternal and fetal outcome with glycaemic control, in a community of Pakistani women. This was a restropective study of 6830 deliveries over a 5-year period in a tertiary care hospital in Karachi. Either a 75 g glucose tolerance test or a screening 50 g glucose challenge was administered depending on risk factors for Gestational Diabetes Mellitus (GDM). Case records of deliveries during this period were analysed for presence of GDM or pre-existing diabetes ; glycaemic control and complications were ascertained for those with diabetes. During this period 267 (3.9%) of the 6380 deliveries were identified as diabetic pregancies. Of these 223 (3.3%) had GDM and 44 (0.6%) women had pre-existing diabetes mellitus. Overall maternal complications were high; pre-eclampsia (19%), polyhydramnios (4.6%) and threatened abortion (3.4%). Fetal complications of macrosomia (13.1%), intraterine growth retardation (7.1%), intrauterine deaths (5.5%) were noted. Complications were higher in poorly controlled groups. We conclude that the prevalence of GDM in Pakistani women in our study was comparable to their Western counterparts but complication rates were higher, possibly due to poorer glycaemic control.

Gravidity, obesity and non-insulin-dependent diabetes among Pima Indian women.

Charles MA, Pettitt DJ, McCance DR, Hanson RL, Bennett PH, Knowler WC. Am JJ Med. 1994 ; 97 : 250-5.

OBJECTIVE – To evaluate the relationships among gravidity, obesity and non-insulin-dependent diabetes mellitus in Pima Indian women.

SUBJECTS AND METHOD – Pima Indian women (n = 2,779) participating in a longitudinal epidemiologic study of diabetes were evaluated in both cross-sectional and longitudinal analyses.

RESULTS – The prevalence of non-insulin-dependent diabetes was higher among women who had never been pregnant than among those who had been pregnant (age and obesity adjusted odds ratio = 2.0, 95% confidence interval = 1.5 to 2.7). Controlled for age and obesity, nondiabetic women who had never been pregnant had significantly higher plasma glucose concentrations by 2% (P = 0.004), higher fasting serum insulin concentrations by 8% (P = 0.09) and higher 2-hour serum insulin concentrations by 10% (P = 0.07) than nondiabetic women who had been pregnant. Among 1,025 women observed for an average of 8 years, those who had not been pregnant by the baseline examination were at significantly higher risk for developing non-insulin-dependent diabetes before the age of 40 years (incidence rate ratio = 1.5; 95% confidence interval = 1.2 to 2.1), but that difference could be accounted for by a higher degree of obesity.

CONCLUSIONS – WE hypothesize that Pima Indian women who have a high risk for non-insulin-dependent diabetes develop obesity and hyperinsulinaemia at an early age and that may be responsible for decreased fertility because of associated changes in six hormones.

COMPLICATIONS

Rate of progression of albuminuria in Type 2 diabetes. Five years prospective study from south India.

John L, Rao PS, Kanagasabapathy AS. Diabetes Care 1994; 17: 888-90.

OBJECTIVE – To evaluate the potential risk factors for the progression of albuminuria in Type 2 diabetes.

RESEARCH DESIGN AND METHODS - ± cohort of 481 Type 2 diabetic patients were followed prospectively for 5 years. Blood glucose (BG) and blood pressure (BP) were checked at 2 monthly intervals, and urinary albumin excretion (UAE) was checked at yearly intervals. Progression of albuminuria was recognised by the development of microalbuminuria and macroalbuminuria and a significant increase in albuminuria within a the microalbuminuric range.

RESULTS – UAE was normal in 349 patients, 93 patients were microalbuminuric and the rest (39) were macroalbuminuric. Sixty-two patients with normal UAE developed microalbuminuria. Ten patients with normoalbuminuria and 23 with microalbuminuria developed macroalbuminuria during the 5-year observation period with overall incidence of 46.9/1,000 person-years for normoalbuminuria and 58.7/1,000 person-years for microalbuminuria. Baseline UAE was significantly higher in those patients who progressed compared with those patients who did not (normoalbuminuroa: 8.5 ± vs 5.3 ± 4 micrograms/min, P< 0.001 microalbuminuria: 68.5 ± 57 vs 47.4 ± 34 micrograms/ min, P<0.001). Multiple regression analysis revealed initial UAE and diabetes duration to be predictors of albuminuria progression.

CONCLUSIONS – Initial UAE is a strong predictor of albuminuria progression in Type 2 diabetic patients.

Pre-diabetic blood pressure predicts urinary albumin excretion after the onset after the onset of Type 2 (non-insulin-dependent) diabetes mellitus in Pima Indians.

Nelson RG, Pettitt DJ, Baird HR, Charles MA, Liu QZ, Bennett PH, Knowler WC. Diabetologia 1993; 36: 998.1001.

Blood pressure was measured in 490 non-proteinuric Pima Indians from the Gila River Indian Community in Arizona at least 1 year before the diagnosis of Type 2 (non-insulin-dependent) diabetes mellitus. Urinary albumin concentration was measured in the same subjects 0-24 years (mean 5 years) after diabetes was diagnosed. Prevalence rates of abnormal albumin excretion (albumin-to-creatinine ratio > or = 100 mg/g) after the onset of Type 2 diabetes were 9%, 16% and 16% and 23%, respectively, for the lowest of highest tertiles of pre-diabetic mean blood pressure. When controlled for age,

sex duration of diabetes and prediabetic 2-hr post-load plasma glucose concentration, higher pre-diabetic mean blood pressure predicted abnormal urinary excretion of albumin after the onset of diabetes. This finding suggest that the higher blood pressure seen in diabetic nephropathy is not entirely a result of the renal disease, but may precede and contribute to it.

Incidence of renal failure in NIDDM. The Oklahoma Indian Diabetes Study.

Lee ET, Lee VS, Lu M, Lee JS, Russell D, Yeh J, Diabetes 1994 ; 43: 572-9.

The incidence of and risk factors for renal failure were determined in 912 Oklahoma Indians with non-insulin-dependent diabetes mellitus in a follow-up study conducted between 1987 and 1990. The incidence rate was 15.7/1,000 person-years after an average follow-up time of 10.2 years. Among those who had no qualitatively positive protein uria at baseline, the incidence of renal failure was 10.3/1,000 person-years compared with 19.3 and 56.2/1,000 person-years, respectively, in those with slight and heavy proteinuira at baseline. Fasting plasma glucose (FPG) > or = 11.1 mM (200 mg/dl) increased the risk of renal failure to 2.9-fold (95% confidence interval [CI] = 1.9-4.6) higher than a level < 7.8 mM (140 mg/dl), and twofold (95%CI = 1.4-3.1) higher than a level between 7.8 (140 mg/dl) and 11.1 mM (200 mg/dl). The hypertensive patient had twice the incidence of renal failure than the normotensive subject (rate ratio = 2.1, 95% CI = 1.4-3.0). Patients with a lower blood pressure under antihypertensive medication had a lower incidence of renal failure than those whose hypertension remained uncontrolled with or without use of medication. Significant independent risk factors for renal failure, identified from Cox's proportional hazards model, were duration of diabetes, FPG, age, hypertension and insulin use ($p < 0.05$). In patients without proteinuria at baseline, FPG and hypertension were significant predictors of renal failure as identified by multivariate analyses, whereas in patients who had proteinuria at baseline, insulin use was significant. Thus, hyperglycaemic and hypertension control are suggested strongly for diabetic Oklahoma Indians as potential strategies to prevent the development of renal failure.

Higher levels of microproteinuria in Asian compared with European patients with diabetes mellitus and their relationship to dietary protein intake and diabetic complications.

Tindall H, Nagi D, Pinnock S, Stickland M, Daveis JA. Diabet Med. 1994; 11 : 37-41.

Asian patients with diabetes have a higher prevalence of renal disease than their European counterparts. The aim of the study was to investigate the pattern of the renal excretion of proteins in 70 Asian and 70 European patients with diabetes and to relate it to dietary intake of protein and prevalence of diabetic complications. Compared with matched Europeans, Asian patients had an increased uninary excretion of albumin and transferrin ($P < 0.02$) with 14 Asians and 6 Europeans having significant microalbuminuria (> 30 micrograms min-1). In 12 Asians and all 6 Europeans this was associated with complications from diabetes, particularly vascular. Asian patients had significantly more ischaemic heart disease ($P < 0.001$) but less neuropathy ($P < 0.001$) and retinopathy ($P < 0.05$) than their matched European counterparts. Asian diets were lower in protein (median (range) Asian vs European: 12.5% (6-29%) vs 19% (11-27%); $P < 0.01$) and carbohydrate but higher in fat than European diets. There was no correlation between dietary protein intake and excretion of any of the urinary proteins measured. However, a significant correlation was found in Asians between protein intake and length of residence in the UK ($P < 0.005$). Unless ways to reduce complications can be found then future allocation of resources will need to take this into consideration in areas with large Asian communities.

Familial predisposition to nephropathy in African-Americans with non-insulin-dependent diabetes mellitus.

Freedman BI, Tuttle AB, Spray BJ. Am J Kidney Dis. 1995; 25 : 710-3.

Nephropathy clusters in Pima Indian families with non-insulin-dependent diabetes mellitus (NIDDM), suggesting that susceptibility to nephropathy is distinct from NIDDM per se. The authors compared the family history of end-stage renal disease (ESRD) from 52 African-American patients with NIDDM-induced ESRD (cases) with 45 age, sex and race-matched non-insulin-dependent diabetics without nephropathy (controls) to assess whether the risk of renal disease was independent from NIDDM in African-Americans as well. Thirty-seven percent (19 of 52) of NIDDM-induced ESRD patients had either a first, second, or third degree relative with ESRD, in contrast to only 7% (3 to45) of diabetic controls. African-American individuals with NIDDM were at eight-fold increased risk for developing subsequent ESRD in the presence of a close relative with ESRD (odds ratio = 8.06, 95% confidence interval, 2.2 to 259.6 P < or = 10.0005). No significant differences were observed in yearly income, years of formal education, total serum cholesterol level, prevalence of smoking, or hypertension between the groups. Diabetic control (assessed by glycosylated haemoglobin and random glucose levels) was suboptimal in non-renal disease controls, suggesting that hyperglycaemia alone fails to cause nephropathy in patients with NIDDM. Family size was unlikely to have influenced the results because diabetic cases had significantly fewer first-degree relatives than did diabetic controls. Familial clustering of ESRD is present in certain African-American families with NIDDM. Differences in family size and degree of diabetic controls are unlikely to account for the differences observed between families.

Blood pressure in Navajo Indians and its association with Type 2 diabetes and renal and cardiovascular disease.

Hoy W, Light A , Megill D. Am J Hypertens. 1994; 7 : 321-8.

In mid-19902 we evaluated blood pressure and its associations in 366 nondiabetic adult Navajos and 400 Navajos with Type 2 diabetes attending Indian Health Service outpatient clinics in Tuba City, Arizona. In nondiabetics, systolic blood pressure (SBP) rose with increasing age while diastolic blood pressure (DBR) fell; 13.4% had hypertension by diagnosis or treatment. Female nondiabetics had lower blood pressures than males. SBP and DBP correlated with age, body mass index (BMI) and urinary albumin excretion (UAE). Hypertension was associated with a sixfold increase in nephropathy, a threefold increase in renal in-sufficiency7 and an almost sixfold increase in cardiovascular disease. Diabetics had higher blood pressures than age-and sex-mustached nondiabetics; 58.4%

had hypertension by diagnosis or treatment and, inspite of widespread antihypertension by diagnosis or treatment an, inspite of wodespread antihypertensive treatment, blood pressures in almost 50% were suboptimal from the perspectives of cardiovascular and renal protection. Blood pressures of female diabetics were similar to of those males. Blood pressures correlated with age, BMI and increasing UAE. Rates of nephropathy and cardiovascular disease were much higher in diabetics than nondiabetics and within the diabetic population hypertension was associated with a greater than threefold increase in nephropathy and eightfold increase in renal insufficiency a fivefold increase in peripheral and cerebrovascular disease suggest similar mechanisms in nondiabetics and diabetics, with diabetes contributing an accentuated susceptibility. Albuminuria and cardiac disease are generated at "subhypertensive" blood pressures, while established hypertension appears to drive overt renal, cerebrovascular and peripheral vascular disease and to further increase heart disease risk.

Cardiovascular disease in Navajo Indians with Type 2 diabetes.

Hoy W, Light A, Megill D. Public Health Rep. 1995; 110 : 87-94.

Rates of both Type 2 diabetes and cardiovascular disease have risen sharply in recent years among Navajo Indians, the largest reservation-based American Indian tribe, but the association between the two conditions is not entirely clear. Rates of cardiovascular disease and some possible associations in several hundred diabetic and non-diabetic Navajos were estimated. Nearly one-third (30.9 percent) of those with diabetes had formal diagnoses of cardiovascular disease – 25.3 percent had heart disease, 4.4 percent had cerebrovascular disease and 4.1 percent had peripheral vascular disease. (The percentages exceed the total because some people had more than one diagnosis.) Age-adjusted rates were 5.2 times those of nondiabetics for heart diseases, 10.2 times for cerebrovascular disease and 6.8 times for peripheral vascular disease. Accentuation of risk was most marked in young diabetics and in female diabetics. Hypertensive diabetics had a twofold increase in heart disease and more than a fivefold increase in cerebral and peripheral vascular disease over non-hypertensive diabetics. Age, blood pressure, cholesterol levels and albuminuria were independent risk factors for cardiovascular disease. Triglyceride levels or body weight were not. Male sex and diabetes duration were independent risk factors for cerebral and peripheral vascular disease but not for heart disease. In the view of the impressive segregation of cardiovascular disease in the diabetic Navajo population, the prevention of diabetes through population-based health promotion seems basic to its containment. Over the short term, vigorous treatment of hypertension in subjects who are already diabetic is mandatory.

Early coronary heart disease together with Type 2 diabetes mellitus in persons of Hindustani origin.

Bongers I, Westendorp RG, Stolk B, huysmans HA, Vandenbroucke JJP. Ned Tijdschr Geneeskd. 1995; 139 : 16-8.

OBJECTIVE – To investigate the association between early coronary heart disease and non insulin dependent diabetes mellitus in South Asian patients in the Netherlands, a homogeneous population which descends from Indian immigrants to Surinam in the late nineteenth century.

DESIGN – Case control study.

SETTING – University hospital Leiden.

METHOD – South Asian patients (n = 38) and control patients (n – 76) were identified in an automated data base comprising all patients who had aortocoronary surgery in the period January 1st 1990 to January 1st 1993. Control patients were from the general population and matched for calendar time. Patients characteristics such as, the onset of coronary heart disease and the presence of non insulin dependent diabetes mellitus were obtained from the medical records at the time of surgery.

RESULTS – The onset of coronary heart disease in South Asian patients occurred about eight years earlier than in control patients (49.8 versus 58.2 years; 95% confidence interval of the difference: 43-12.5). Non insulin dependent diabetes mellitus was about four times more frequent in South Asian patients (50% versus 13%; 10-54). This difference was the same after correction for differences in sex, age body mass index.

CONCLUSION – Diabetes mellitus caused by insulin resistance significantly contributes to early coronary heart disease in South Asian immigrant patients, in accordance with the literature on the present population of India. These findings strengthen the belief that genetic factors are important in the development of insulin resistance and atherosclerosis.

Essential fatty acid metabolism in patients with essential hypertension, diabetes mellitus and coronary heart disease.

Das UN. Prostaglandins Leukot Essent Fatty Acids. 1995; 52 : 387-91.

Mortality and morbidity from copronary heart disease (CHD), diabetes mellitus (DM) and essential hypertension (HTN) are higher in people of South Asian descent than in other groups. There is evidence to believe that essential fatty acids (EFAs) and their metabolites may have a role in the pathobiology of CHD, DM and HTN. Fatty acid analysis of the plasma phospholipid fraction revealed that in CHD the levels of gamma-linolenic acid (GLA), arachidonic acid (AA), eicosapentaenoci acid (EPA) and docosahexaenoic acid (DHA) are low, in patients with HTN, Linoleic acid (LA) and AA are low in patients with non-insulin the levels of dihomo-gamma- linolienic acid (DGLA), AA, alphalinplenci acid (ALA) and DHA are low, all compared to normal controls. These results are intereszting since DGLA, AA and EPA form precursors to prolrstaglandin E1 (PGE1), prostacylin (PG 12) and PG 13, which are potent platelet anti-aggregators and vasodilators and can prevent thrombosis and atherosclerosis. Further, the levels of lipid peroxides were found to be high in patients with CHD, HTN, NIDDM and diabetic nephropathy. These results suggest that increased formation of lipid peroxides and an alteration in the metabolism of EFAs are closely associated with CHD, HTN and NIDDM in Indians.

Prevalence and risk factors for diabetes and diabetes-related amputations in American Indians in southern Arizona.

Wirth RB, Marfin AA, Grau DW, Helgerson SD. Diabetes Care 1993; 16 : 354-6.

OBJECTIVE – To describe the prevalence of NIDDM and LEA using data from a computer based from a computer based patients data base.

RESEARCH DESIGN AND METHODS – Diabetic patients with and without LEA, and nondiabetic patients were identified by computer search. Charts of diabetic patients were reviewed for confirmation of diagnosis of diabetes and diabetes-related amputation. The diabetic and nondiabetic populations were described and certain risk factors were identified.

RESULTS – The overall prevalence of NIDDM in this tribe in 1985-1986 was 18.3/100 adults (> or = 18 yr of age), whereas the prevalence of LEA/100 adults with NIDDM was 10.3%. Females were 1.3 times as likely to have diagnosed diabetes as males (95% CI 1.2-1.4), and males with diabetes were 1.4 times more likely to have had LEA than females with diabetes 95% CI 1.1-1.9).

CONCLUSIONS – Automated health-care delivery data base used for this tribe can be used to maintain surveillance for diabetes and amputations in diabetic patients. Effective programs to prevent complications of diabetes, such as LEA, in this tribe are urgently needed.

Lower-extremity amputation. Incidence, risk factors and mortality in the Oklahoma Indian Diabetes Study.

Lee JS, Lu M, Lee VS, Russell D, Bahr C, Lee ET. Diabetes 1993; 42 : 876-82.

Oklahoma Indians with NIDDM (n = 1012) underwent a baseline examination in 1972-1980. The incidence of and risk factors for first lower-extremity amputation were estimated. The mortality rates of amputees using data from 875 patients who had no previous history of amputation between 1987 and 1991 are presented. The mean age of the 875 patients was 51.0 ± 10.8 yr and the mean duration of diabetes was 6.6 ± 6.1 yr. After a mean follow-up time of 9.9 ± 4.3 yr, the incidence rate of first LEA among diabetic Oklahoma Indians was 18.0/1000 person-yr. The incidence rate was two times higher in men than in women. In both sexes, significant risk factors ($P < 0.05$) were retinopathy and duration of diabetes. Fasting plasma glucose, use of insulin and systolic blood pressure were significant for men only. For women, plasma cholesterol and diastolic blood pressure were additional risk factors. Compared with the mortality rate of 33.5/1000 person-yr among nonamputees, the rate among amputees was 55.5/1000 person-yr. The 5-yr survival rate after first amputation was 40.4%. For the amputees, the most common causes of death were diabetes (37.3%), cardiovascular disease (29.1%) and renal disease (7.3%). The incidence and mortality rates in diabetic Oklahama Indians were higher than those reported in Pima Indians and other diabetic populations. To lower the incidence of lower-extremity amputation in this high-risk population, preventive action through education, foot care programmes, and early detection of lesions must be intensified.

DIABETES EDUCATION

Diabetes Education: an Asian perspective.

Wilson E, Wardle EV, Chandel P, Walford S. Diabete Med. 1993; 10 : 177-80.

Asian diabetic patients often lack knowledge about diabetes and self-management of the disease due to difficulties in communication. The introduction of a diabetes education programme specifically for Asian patients has resolved many of the communication problems, provided education which Asian patients could understand, and raised awareness of diabetes within the Asian community. Forty-eight percent of Asian patients were unable to read, while only 26% read spoke and 20% read English, emphasising the need for education in Asian languages using oral and visual teaching methods. Cultural differences were identified such as the use of alternative therapy to supplement treatment (33%) and the large number of vegetarians (61%). Public awareness of diabetes in the Asian community was increased by providing health education at social venues. The provision of diabetes education designed for the needs of Asian patients is essential to improve the quality of life and life expectancy of these patients.

The problem of integration: Asian people and diabetes.

Kelleher D, Islam S. JR Soc Med. 1994; 87 : 414-7.

There is a high prevalence of non-insulin dependent diabetes (NIDD) in some Asian populations in the UK. The study by Mckeigue showed that the prevalence was high amongst the Bangladeshi population. Most doctors were aware of this and concerned that they did not know sufficient about the everyday lives and eating patterns of their patients to advise them about how to adjust their lifestyle to control their diabetes. As non-insulin dependent diabetes is managed by controlling eating and by tables which stimulated the production or use of the naturally produced insulin, it is important that the medically prescribed treatment is integrated into the lifestyle because the day to day treatment is in the hands of the patients themselves. The patient has to controls his or her eating; decide what to eat, how much to eat and what not to eat. All diabetic people have to make these decisions in the context of their everyday lives surrounded by other people who are enjoying eating without such restraints. The evidence from this study suggests that the problem is particularly difficult for diabetic Bangladeshi people. The reason for this appears to be that food plays a very important part of Bangladeshi culture which has many rules restricting what can be eaten and also placing importance on eating certain foods. The problem for them, is to integrate this traditional and religious rule governed system of eating with the system of modern medicine. The aim of this study was to understand and describe the ways in which diabetic Bangladeshi people are attempting this integration.