

Non-communicable Diseases 2

Chairpersons: N Unwin, H Fraser

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Association between obesity and impaired glucose tolerance among high school adolescents in New Providence, Bahamas

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Objective: To determine the incidence of impaired glucose tolerance (IGT) in adolescents and evaluate the association of IGT with obesity in Bahamian youth.

Design and Methods: Eight hundred and seventy-three adolescents (ages 13–19 years of age) were randomly selected from five high schools in New Providence from January to April 2012. Demographic and lifestyle variables were collected *via* a questionnaire. Weight and height were measured to the nearest 0.1 kg and the nearest 0.1 cm. Waist and hip circumferences were also recorded. Participants were screened for IGT using glycated haemoglobin (HbA_{1c}) and a two-hour oral glucose tolerance test (OGTT) [using 1.75 g/kg oral glucose to a maximum of 100 g].

Results: Of the 861 adolescents who completed the study, 15.0% were overweight, 15.2% were obese and 7.9% were severely obese. Overweight and obesity (body mass index \geq 85th percentile) was seen in 33.1% of males and 40.4% of girls. The incidence of IGT was higher in males than females. Many overweight and obese subjects were identified as having IGT compared to their non-obese counterparts. Overweight and obese adolescents had significantly higher two-hour post-prandial glucose compared to normal adolescents.

Conclusions: Strong positive associations were identified between IGT and obesity among adolescents in New Providence.

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Evaluation of pulmonary dysfunction among persons with Type 2 diabetes in Trinidad

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Objectives: To determine the prevalence of pulmonary dysfunction among persons with Type 2 diabetes mellitus using spirometry, and to determine the relationship between pulmonary dysfunction and duration of diabetes, body mass index (BMI), age, gender and ethnicity.

Design and Methods: Data were obtained from 93 persons with Type 2 diabetics from various clinics in Trinidad. Variables measured included forced expiratory volume (FEV₁), forced vital capacity (FVC), FEV₁/FVC and forced expiratory flow (FEF_{25–75}).

Results: The durations of diabetes of the 93 patients ranged from 0.4 to 35 years. There were no significant differences between the means of the spirometry ratios for the five-year interval ranges of diabetes duration. Approximately 60% (56) of the patients had normal pulmonary function and 40% (37) of the patients had pulmonary dysfunction. The majority of patients were found to have restrictive pulmonary dysfunction, and only 2% presented with obstruction. Within the BMI classes, 5% of the patients were underweight, 36% were normal, 33% were overweight and 26% were obese. There was a significant difference between the means of underweight and overweight patients for FEV₁/FVC ratios ($p < 0.05$). There was no significant correlation between the spirometry variables and the duration of diabetes or the BMI.

Conclusion: Just under one-half of persons with Type 2 diabetes mellitus display a restrictive spirometric profile and there are significant differences in FEV₁/FVC ratios between underweight and overweight persons.

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Management guidelines for Type 2 diabetes: Toward a sustainable evidenced based approach of Type 2 diabetes management in public primary care in Barbados

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Objective: To find out to what extent diabetic patients in public primary healthcare setting in Barbados are reaching the targets set out in the Caribbean Health Research Council guidelines for blood sugar, blood pressure and lipid control.

Design and Methods: This was a retrospective descriptive chart review of 499 Type 2 diabetic clients not on insulin, aged 25 years and older. Records were selected using quota sampling; a validated data abstraction form was used to abstract relevant information for the two-year period January 1, 2009 to December 31, 2010. Chi 2 was used for comparison of groups who did or did not meet the various targets.

Results: Data were collected and analysed on 499 clients from eight polyclinics (370 females, and 182 males). Regarding, blood pressure, 99% of patients had measurements taken with 47% of males and 32% of females ($p = 0.001$) attaining their targets. Seventy-five per cent of patients had their cholesterol measured with 8.6% reaching the target; 60% had glycosylated haemoglobin measured with 41% attaining the target. Less than half of the participants (48.9%, $n = 244$) were measured for all three targets and only 1.2% ($n = 3$) attained all three targets.

Conclusion: There was inadequate monitoring, suboptimal achievement of targets and underutilization of the guidelines. There is a need to find ways of reaching the targets set out in evidence based guidelines and to achieve optimum patient outcomes.

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Inpatient diabetes care at the Queen Elizabeth Hospital in Barbados

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Objective: To assess the burden and quality of inpatient diabetes care at the Queen Elizabeth Hospital in Barbados.

Design and Methods: The care of all patients with diabetes on medical, surgical, gynaecology, high dependency and intensive care beds was audited over 48 hours with data collection from patients, their notes and management charts. Linear regression analysis was used to compare mean age of men and women. Descriptive statistics were utilized for other aspects of analysis.

Results: The prevalence of inpatient diabetes was 42.5% (111/261, 95% CI 36.4, 48.8%). Fifty two per cent were male and women were on average 5.8 years older ($p = 0.03$). The majority of patients had Type 2 diabetes treated with insulin (with or without tablets) or only with tablets (41.8% and 43.6%, respectively). Diabetic foot disease accounted for 29.9% of all admissions and 88.9% of diabetes related admissions. Only 13.9% of the patients admitted without diabetic foot disease had their feet examined and 2.8% of patients developed foot lesions during their stay. Medication errors were experienced by 41.4% of patients.

Conclusion: Inpatient diabetes is prevalent and this is significantly driven by diabetic foot disease. Care is complex, including the frequent use of insulin. However, the quality of care can be improved through effective education of healthcare professionals.

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Non-invasive vascular scanning techniques in the investigation of the diabetic Foot

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Objective: To compare the measurements of tissue oxygen saturation (SO_2) between persons with a current non-healing foot ulcer and persons with no current or history of foot ulcer.

Design and Methods: Forty-five patients with a current non-healing foot ulcer [≥ 30 days] (cases) and 44 persons with no current or history of foot ulcer (controls) were recruited, matched for age. Tissue SO_2 was measured by visible lightguide spectrophotometry and endothelial function from a calculated reactive hyperaemia index (RHI). Vibration sensitivity was measured by neurothesiometry. Readings were conducted in the arm, with each run consisting of five-minute periods each of pre-occlusion, occlusion and post-occlusion. This generated an RHI. The lightguide spectrophotometer probe was moved down the leg of an individual, obtaining $SO_2\%$ readings used to generate degree of tissue hypoxia (DTH) values.

Results: The age of cases and controls was 57.8 ± 8.6 and 60.0 ± 11.6 years, respectively. Cases had a significantly longer duration of diabetes (17.6 ± 11.5 vs 12.4 ± 10.6 years, $p < 0.033$). Median DTH in cases was 12.1% (95% CI 9.4, 20.8) and 9.9 (95% CI 5.3, 15.0) in controls. Mean RHI in cases was 2.1 ± 0.1 SEM and 2.1 ± 0.1 SEM in controls. Neurothesiometry revealed significantly greater

peripheral neuropathy in cases vs controls (27.0 ± 2.2 vs 15.8 ± 1.9 , $p < 0.002$).

Conclusions: Reactive hyperaemia index has a zero value as a predictor of diabetic foot ulceration, while further investigations in a larger sample could be of value in determining if DTH can be an independent predictor of diabetic foot ulceration.