

Non-communicable Diseases I

Chairpersons: M Thame, S Harding

O – 37

Disparities in trends in premature adult mortality from coronary heart disease and stroke in ten countries of the Caribbean Community 1991 to 2012

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Objective: To determine the relative change and examine disparities in trends in coronary heart disease (CHD) and stroke mortality among countries within the Caribbean Community and Common Market (CARICOM) from 1991 to 2012 for adults aged 30–69 years.

Methods: For 10 full member states of CARICOM, we obtained numbers of deaths by age and gender from the World Health Organization mortality database and population data from the United Nations World population prospects. We compared age-standardized CHD and stroke rates between countries and between selected time periods (1991, 2001, 2012) using the 2000 world standard population, for adults aged 30–69 years. We measured disparity using absolute mean difference (AMD). For each country, we assessed relative change between the periods 1991–2001 and 2002–2012 using log-linear modelling.

Results: In both time periods, six countries noted declines in premature CHD mortality rates. In 2002–2012, three countries noted 25% or greater reduction: Barbados -0.65 (95% CI (0.53, 0.79)) St Lucia -0.74 (0.61, 0.91) and Trinidad and Tobago -0.61 (0.52, 0.70). Increases were noted in Antigua and Barbuda 1.14 (0.93, 1.41), Grenada 1.55 (1.34, 1.79), Guyana 1.25 (1.13, 1.38) and St Vincent and Grenadines 1.56 (1.24, 1.96). Most countries noted declines in premature stroke mortality rates in both time periods. Using AMD, the highest level of disparity between

countries was found in 2012 relative to 2001 and 1991 for CHD; for stroke disparity was greater in 1991.

Conclusion: We found differences in trends in premature CHD among 10 Caribbean populations. Understanding reasons for these differences is critical in informing policies shaping cardiovascular diseases management.

O – 38

Factors that affect medication adherence in the adult hypertensive and Type 2 diabetic population

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Objective: To identify demographics and factors that affect medication adherence in the adult hypertensive and Type 2 diabetic population in The Bahamas.

Methods: A survey was conducted using a cross-sectional design and convenience sampling approach. Target population were adults aged 18 years and older with hypertension and/or Type 2 diabetes at public clinics and/or Accident and Emergency Department in New Providence and Grand Bahama. Using Cochrane's equation, with a 10% refusal rate, the total number of participants needed to complete questionnaires was 427. The Morisky Medication Adherence Scale (MMAS) and brief medication questionnaire (BMQ) were used. The IBM statistical package for the social sciences (SPSS) statistics were employed to produce descriptive and inferential statistics.

Results: Of the 281 participants, 193 (68.7%) were female; 1.8% did not specify. Median age range was 50–64 years (IQR: 30–49 years, > 65 years). Median Morisky score was three (IQR 1, 5). Scores were related to participant's age ($r_{Sp} = 0.142, p = 0.041$), use/or not of bush/alternative medicines ($r_{Sp} = -0.278, p < 0.001$), amount of medications taken ($r_{Sp} = 0.145, p = 0.036$), difficulty remembering to take medications ($r_{Sp} = 0.751, p < 0.001$), concerns about

long-term side effects ($r_{Sp} = 0.243$, $p = 0.001$), and those patients on both hypertensive and diabetic medications ($p = 0.028$).

Conclusion: Over 50% of this population demonstrated adherence, in keeping with the World Health Organization findings. Leading factors associated with improved adherence were increasing age/amount of medications, no use of complementary and alternative medicine, the ability to remember medications, taking both hypertensive and diabetic medications and less concern about long-term side effects. This study's findings reflected reasonable adherence in the Bahamian population.

O – 39

Diabetes distress and diabetes self-care in Barbados

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Objective: To measure the prevalence of diabetes distress and to determine diabetes self-care behaviours in people with Type 2 diabetes mellitus in Barbados.

Methods: A quantitative cross-sectional study using consecutive sampling among people with Type 2 diabetes attending all nine primary care, public-sector, polyclinics in Barbados. Data were collected using a questionnaire including demographic data, the diabetes distress scale (DDS) and the summary of diabetes self-care activities (SDCA) scale. Participants were weighed; glycated haemoglobin and height were obtained from the charts.

Results: There were 179 participants (85% response rate) with a mean age of 64 years (SD 10.6), 29% male, 97% black, 43% completed secondary school, 47% retired, 34% employed and a mean HbA_{1c} of 8.1% (SD 2.2%). The prevalence of moderate or greater diabetes distress was 13% (95% CI: 8.3, 18.7). The DDS scores were higher in the 40–59 vs 60–79 years age group ($p = 0.007$) and increased as BMI increased ($p = 0.026$) and number days/week participants paid attention to their diet decreased ($p = 0.001$). The average number of days in the previous week that participants paid attention to their diet, exercise, blood sugar monitoring and foot care were 3.8 (SD 1.5), 2.8 (SD 2.3), 3.8 (SD 2.7) and 5.0 (SD 2.3), respectively. Insulin users were more likely to have positive self-care behaviours related to blood sugar monitoring ($p = 0.0001$) and foot care (0.02).

Conclusion: Diabetes distress (moderate or greater) prevalence was lower than reported in other populations. Many deficiencies in diabetes self-care were found.

O – 40

Demographic and lifestyle factors that affect haemoglobin A_{1c} awareness amongst Type 2 diabetic patients in Trinidad and Tobago

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Objective: To determine the awareness of personal haemoglobin A_{1c} (HbA_{1c}) values among a Type 2 diabetic population in Trinidad and correlate this awareness with educational levels, dietary intake and physical activity.

Methods: A cohort study of a total of 222 Type 2 diabetic public clinic attendees were assessed *via* questionnaire evaluating their demographics, type and duration of diabetes, type and frequency of glucose testing, medical history and diabetes care *via* dietary intake and physical activity. Haemoglobin A_{1c} data were coded as patients who were aware vs patients who were not aware. Pearson Chi-square analyses were used to detect significant differences between the proportion of persons who were aware of their HbA_{1c} values and their carbohydrate intake, exercise intensity and education level. A p -value of < 0.05 was regarded as being statistically significant.

Results: A total of 222 persons were surveyed accounting for 93 (41.9%) males and 129 (58.1%) females. Of the respondents, 41.9% were aware of the term HbA_{1c} while 58.1% were unaware. Statistically, there were positive correlations ($p < 0.05$) between HbA_{1c} awareness and level of education received by Type 2 diabetic patients as well as between HbA_{1c} awareness and intensity of exercise performed ($p < 0.05$). However, the relationship between dietary breakfast choices and HbA_{1c} awareness was not significant ($p = 0.079$).

Conclusion: A significant correlation was established between HbA_{1c} awareness and intensity of exercise performed by Type 2 diabetic patients. There was also a significant correlation between HbA_{1c} awareness and level of education obtained.

O – 41

Effect of an alcoholic soluble extract of Momordica Charantia, Kuguacin-J and Cisplatin on MCF-10a, MCF-7 and Mda-MB-231 breast cancer cell lines *in vitro*

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Objective: This study was designed to investigate the anti-cancer properties of an alcoholic soluble extract of Momordica charantia (*M charantia*) and one of its isolated compounds, Kuguacin-J (K-J) on isolated breast cancer cell lines. The effect of cisplatin was investigated for

comparison. Prior to the availability of chemotherapeutic agents, dietary measures, including traditional medicines derived from plants, were the major forms of cancer treatment. *Momordica charantia* is believed to possess anti-carcinogenic properties, and it can modulate its effect *via* xenobiotic metabolism and oxidative stress.

Methods: This was an *in vitro* study that employed time course reaction that involved the use of Kuguacin-J (K-J), an isolated commercial compound from *M charantia*, an alcoholic extract from the green fruits of *M charantia* and compared to cisplatin, a commercial anticancer drug on normal human mammary primary epithelial healthy cells) MCF-10 and, (MCF-7) and [human mammary primary epithelial cancer cells] (MDAMB-231) breast cancer cells.

Results: The results showed that the ethanol soluble extract of *M charantia* or K-J killed the MCF-7 cells only at high concentration (8 µg–80 µg/mL) compared to cisplatin which killed the cells using 80 µg–800 µg/mL either alone or when combined. In addition, all concentrations (8 µg–800 µg/mL either alone or when combined) of the ethanol extract, K-J or cisplatin killed MDAMB-231 cell line almost 100%.

Conclusion: The *M charantia* extract, however, did not kill the normal cells, unlike cisplatin. The anticancer effect is through the release of caspases.

O – 42

The hypoglycaemic effect of fractions obtained from ethyl acetate extract of *Desmodium canum* (strong back weed) in a rat model

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Objective: To purify compounds from *Desmodium canum* that show hypoglycaemic activity in normal Sprague-Dawley Rats.

Methods: Crude hexane, ethyl acetate and methanol extracts of *Desmodium canum* were bioassayed on Sprague-Dawley rats using oral glucose tolerance test (OGTT). In this research, a fasting blood glucose level (BGL) reading was taken followed by intravenous administration of extracts (50 mg/kg bodyweight [BW]) or control (dimethyl sulfoxide [DMSO]). Blood glucose level readings were taken at 30-minute intervals for one hour, followed by an oral administration of glucose at 1.75 g/kg BW. Blood glucose levels were then taken at 30-minute intervals for a further 2.5 hours. The most hypoglycaemic extract was separated using a series of column chromatography and the products bio-assayed.

Results: The crude ethyl acetate extract had the most significant hypoglycaemic activity when compared with the DMSO control at times: 60 minutes (4.08 ± 0.21 mmol/L vs 4.69 ± 0.26 mmol/L, $p < 0.01$); 120 minutes (4.89 ± 0.083 mmol/L vs 5.50 ± 0.17 mmol/L, $p < 0.00024$) and 150 minutes (4.42 ± 0.22 mmol/L vs 4.64 ± 0.25 mmol/L, $p < 0.008$). A series of purification of the crude extract resulted in the semi-purified fraction, KLF6.3E-M which showed the most hypoglycaemia vs the control, DMSO. This was evident especially throughout the post-prandial region (90–180 minutes) such that at 90 minutes (4.43 ± 0.15 mmol/L vs 5.62 ± 0.11 mmol/L, $p < 0.05$) and at 150 minutes (3.43 ± 0.29 mmol/L vs 4.64 ± 0.25 mmol/L, $p < 0.05$), respectively.

Conclusion: From the crude ethyl acetate extract, fraction KLF6.3E-M showed the most significant hypoglycaemic effect. The isolation of the hypoglycaemic principles may introduce new therapeutic approaches to diabetes within Jamaica.