

## 3<sup>rd</sup> Annual Research Day: 17<sup>th</sup> April 2009

### The Onset of Diseases: Genes *versus* Environment

#### Insulin Antibodies in Type 1 Diabetes\*

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**Background:** Type I diabetes mellitus (T1DM) is a complex genetic disorder in which multiple susceptibility genes interact with environmental factors to initiate or modify immune B-cell destruction. Current results show the risk for developing T1DM is about 70% for a monozygotic co-twin of a patient and about 10–15% for dizygotic co-twins. The HLA region, Human Leucocyte Antigen, also known as the major histocompatibility complex (MHC) is a cluster of 200 known genes on the short-arm of chromosome 6:

MHC is divided into three Regions:

Class I Encodes genes for classic transplantation antigens

Class II Immune response genes-herein are T1DM susceptible genes

Class III these genes include TNF and complements

HLA phenotype in Caucasian patients has shown susceptibility to T1DM with the following alleles:

DR3-DQ2 DR4-DQ8 DR4-DQ2

And there is protection with DR2-DQ6.

We previously showed that The Bahamas has the highest incidence of T1DM worldwide in people of African origin, 10.1/100 000, three times that of Barbados. Highest incidence worldwide is in Finland and Sardinia 50/100 000. We postulated that there is a putative genetic factor.

**Aim:** To determine HLA-Phenotype in our cohort of T1DM and non-diabetic controls.

**Methods:** Patients with T1DM were chosen prospectively and consecutively and blood was drawn for HLA phenotyping. Subjects without T1DM were chosen in a similar manner and comprised the controls. The blood samples were analysed using the standard microlymphocytotoxicity method by QUEST Laboratory, California.

**Results:** 35 patients with T1DM Male 18  
Female 17

Age Range 4–24 years Mean Age 12.3 years

17 controls

Male 8

Female 9

Age Range 4–28 years Mean Age 16.3 years

HLA phenotypes for patients and controls

| HLA     | Patients<br>n = 35 | Percentage<br>% | Control Patients<br>n = 17 | Percentage |
|---------|--------------------|-----------------|----------------------------|------------|
| DR2     | 4                  | 11              | 7                          | 41         |
| DR3     | 14                 | 40              | 7                          | 41         |
| DR4     | 29                 | 82.8            | 8                          | 47         |
| DR17    | 12                 | 34              | 1                          | 5.8        |
| DQ2     | 24                 | 68.5            | 7                          | 41         |
| DQ3     | 7                  | 20              | 0                          | 0          |
| DQ5     | 3                  | 8.5             | 6                          | 35         |
| DQ6     | 2                  | 5.7             | 6                          | 35         |
| DQ8     | 4                  | 11              | 1                          | 5.8        |
| DR2DQ6  | 1                  | 2.8             | 4                          | 23.5       |
| DR3DQ6  | 7                  | 20              | 1                          | 5.8        |
| DR4DQ2  | 21                 | 60              | 6                          | 35         |
| DR17DQ2 | 11                 | 31              | 1                          | 5.8        |

**Conclusion:** There is a high frequency of DR4 and DQ2 in T1DM. In controls DQ6, DQ5 and DR2 appear to be protective alleles. DR17 seems to be associated with T1DM in The Bahamas (OR = 7.3,  $p = 0.07$ ).

\* Abstract presented in 2007 and 2009

#### Teenage Pregnancy and HIV Risk Reduction in The Bahamas

V Sakharkar

**Introduction:** Sexually transmitted diseases and HIV poses a great disease burden in young adults especially if they are indulged in risky sexual behaviour. One on one counselling and educating adolescents about risk reduction strategies can decrease the rate of STI, HIV and unintended pregnancies. Pregnancy may not be the ideal situation but an excellent opportunity to introduce such programme. A risk reduction programme was introduced in the adolescent antenatal clinic which included a self-administered questionnaire to the adolescent pregnant patients to learn about their own strategies about reducing the risk of STI, HIV and unintended pregnancy.

**Aim:** To evaluate the perception of risky sexual behaviour by pregnant adolescents and their plan for self-initiated risk reduction strategies.

**Material and Methods:** All pregnant adolescent patients registered in the adolescent antenatal clinic in the year 2007 and 2008 were interviewed and given a questionnaire to

plan their own risk reduction strategies for the future after a brief counselling. The questionnaire was developed by the Counselling Department of Ministry of Health of The Bahamas and included seven questions which provided various options about STI/HIV risk reduction where client can choose one or all the options as well as give a descriptive answer if they wish. Data from the questionnaire was analysed to access their perception and plans for risk reduction in the future. Data analysis was carried out using SPSS 14.0 student edition.

**Results:** Total 396 clients were registered and given the questionnaire. Demographics are as follows Mean age  $\pm$  SD =  $16.2 \pm 1.02$  (range 13–18), 84.6% Bahamians, median education grade 11, mean grade point average (GPA)  $\pm$  SD =  $2.00 \pm 0.67$  (range 0–3.81). Mean age of initiation sexual activity  $\pm$  SD =  $14.9 \pm 1.2$  (range 12–17). Mean number of sexual partners and age of sexual partner was  $2.1 \pm 1.5$  (range 1–10) and  $20.9 \pm 4.37$  (range 14–49), respectively. All the clients except three cases of sexual molestation admitted risky sexual behaviour. Response to risk reduction questions is summarized as follows. The majority of the respondents, 88.6% planned to talk to the partner about HIV/STI risks.

Only 42.4% would talk to partner friends and others. Sixty-three planned to bring partner to the site for HIV testing and 47.4% will either use condom or abstain till the partner is tested for HIV. Regarding the plan to change high risk partner; 72.8% said that they will break-up with the high risk partner; 54.8% will get to know the partner before having sex. Also, 55.1% denied having used alcohol or drugs; 29.1% said they will avoid places where drugs or alcohol is used and 56.6%; clients said they will use condoms and 47.7% will talk to partners about condom use. Only 26 (6.5%) answered the question about other plans and 77% of them decided to abstain from sex until they are self-dependent.

No correlation was found between academic performance (GPA) and age of initiation of sexual activity or number of sexual partners.

**Conclusion:** Pregnant adolescents in The Bahamas admitted to risky sexual behaviours but planned to reduce STI/HIV risk mostly through dialog, getting partners tested for HIV and practice safe sex.

### **Effects of Sedentary Activity on Obesity in Adolescents**

*F Williams*

**Objective:** The study aimed to examine the relationship between body mass index (BMI), sedentary behaviours and physical activity among adolescents in New Providence and explore the impact of sociodemographic factors on them.

**Methods:** Four hundred and eleven students from two schools were eligible to participate in the study. Questionnaires were administered to 360 adolescents between

the ages of 10 and 19 years of age. Hours of television viewing, computers use, video game use and level of physical activity were assessed with self-report instruments. Height and weight were measured and BMI (ratio of weight [in kilograms] to height [in metres] squared) percentiles were assigned according to age and gender for analyses.

**Results:** Overall, 31% reported participating in moderate physical activity less than five days per week, 49% reported participating in vigorous physical activity less than three days per week, 32% reported participating in strength training less than three days per week and 46% reported watching television less than four hours per school day. There was no statistically significant relationship between BMI, sedentary behaviours and physical activity.

**Conclusion:** The prevalence of at-risk and overweight adolescents is high. Additionally, levels of sedentary activities are also high, while levels of physical activity are low thereby creating great cause for concern. More research is required to better define the various factors which contribute to overweight in the Bahamian adolescent population.

### **The Prevalence of Cervical Cytology Abnormalities and Human Papillomavirus in Women Infected with the Human Immunodeficiency Virus**

*DN Dames, C Ragin, A Griffith-Bowe, P Gomez, R Butler*

**Introduction:** The human papillomavirus (HPV) is the major aetiologic agent in the development of cervical cancer and its natural history of infection is altered in persons infected with the human immunodeficiency virus (HIV). The prevalence of HPV-infection and cervical dysplasia in the HIV sero-positive females in The Bahamas is not known. Finding out the prevalence would allow for the establishment of protocols to optimize total care of this population and help prevent morbidity and mortality related to cervical cancer.

**Objective:** The objective of this study, was to determine the prevalence of high risk HPV genotypes and cervical dysplasia in the HIV sero-positive females attending the Infectious Disease Clinic at the Princess Margaret Hospital, Nassau, The Bahamas.

**Methods:** One hundred consecutive, consenting, non-pregnant, HIV-sero-positive females from the Infectious Disease Clinic at the Princess Margaret Hospital in Nassau, The Bahamas were screened for high-risk HPV-infections and cervical cytology abnormalities using liquid-based pap smear and signal amplification nucleic acid method for HPV detection. A questionnaire was also utilized to gather demographic information and obtain information on known risk factors associated with HPV-infection s such numbers of partners.

**Results:** The prevalence of high-risk HPV was 67% and cervical abnormalities were noted in 44% of the study population. High-risk HPV types were more likely to be

present in women with CD4<sup>+</sup> cell counts less than 400 l–1 and in women with cervical cytology abnormalities (97%). The most common cervical abnormality was low-grade squamous intraepithelial lesions.

**Conclusion:** Findings suggest that HIV-sero positive females should have HPV testing done as part of their normal gynaecology evaluation and these patients should be encouraged and provisions be made for ease of access having regular PAP smears and HPV testing.

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### **Incidence and Neonatal Complications of Vacuum Extraction at The Princess Margaret Hospital, The Bahamas**

*L Pedro*

**Objective:** To determine the difference of fetal outcome of newborns delivered by vacuum extraction (VE) and those by spontaneous vaginal delivery (SVD) at Princess Margaret Hospital (PMH), Nassau, The Bahamas.

**Methods:** All parturients delivered by vacuum extraction from January 1, 2006 to December 31, 2006 were included as cases (n = 103). These were matched with controls selected from SVD. Apgar scores at one and five minutes of study group and controls were analysed by Student *t*-test. To detect any significant difference between the study group and control, statistical analysis was performed using excel and SPSS computer package.

**Results:** There were 97 successful vacuum extraction of greater than thirty-four weeks gestation. Six neonates (5.8 %) were admitted to NICU with one recorded infant death (1%).

**Conclusion:** Among 3402 deliveries in 2006, there were 103 attempted vacuum extraction deliveries. The rate of VE was 3% with one fetal death among six neonates admitted to neonatal intensive care unit (NICU). There were no statistical significant differences in Apgar scores of babies delivered by VE and those delivered spontaneously.

### **The Effect of Maternal Body Mass Index on Pregnancy Outcomes**

*A Griffith-Bowe*

**Objective:** To examine the effect of maternal pregravid weight on pregnancy outcome.

**Methods:** A population-based prospective cohort study of pregnant women delivering at the Maternity Ward of the Princess Margaret Hospital from February 2008 to September 2008 was done. Patients were stratified by pre-pregnancy body mass index (BMI) as underweight, less than 18.5; normal, 18.5 through 24.9; overweight, 25.0

through 29.9; and obese, 30.0 or more. The cohort was examined to assess the risk of four pregnancy outcomes: pre-eclampsia, gestational diabetes mellitus (GBM), infant birthweight and mode of delivery.

**Results:** The risk of pre-eclampsia and abdominal delivery was highest among overweight and obese women. The risk of delivering a macrocosmic fetus was highest among the obese and overweight women but underweight women did not demonstrate an increased risk of delivering a low birthweight infant. Additionally, overweight or obese women in this study did not demonstrate a significantly increased risk for the development of gestational diabetes.

**Conclusion:** There is a high prevalence of overweight and obese women in the obstetric population in the island of Bahamas. Overweight and obese women demonstrated an increased risk for pre-eclampsia, fetal macrosomia and abdominal delivery. In this cohort underweight women did not demonstrate any tendency toward poor pregnancy outcomes.

### **The Feasibility of Introducing Human papillomavirus Testing as Part of the Management Protocol for Atypical Squamous Cell Noted on Cervical Cytology in a Low Resources Setting**

*D Halliday, R Butler*

**Background:** When atypical squamous cells (ASC) are noted on cervical cytology, repeat smears, immediate colposcopy or high risk human papilloma virus (HR HPV) triage prior to colposcopy are all effective in excluding cervical intra epithelia neoplasia (CIN) grade 2/3. We sort to determine if HR HPV triage for ASC would be feasible in a low resource centre.

**Methods:** We conducted a chart review of all colposcopies done between 2004 and December 2008. Previous studies showed that HPV triage for ASC would refer half as many patients to colposcopy yet detect the same number of cases of CIN 2/3. Using this assumption, we calculated the difference in cost between immediate colposcopy and HPV triage prior to colposcopy per case of CIN2/3 diagnosed.

**Results:** Atypical squamous cells were noted in 137 cases. For all patients (group A) and for patients 21 years and older (group B), it required 15 colposcopies to diagnose one case of CIN2/3 and for patients 30 years and older (group C) it required 75 colposcopies to diagnose one case on CIN 2/3. The savings per case of CIN2/3 diagnosed if HPV triage is used was \$642.81, \$637.50 and \$3187.50 for groups A, B and C respectively. The cost for colposcopy with or without biopsy was \$165.00 and an HPV test should have cost \$40.00.

**Conclusion:** High risk human papilloma virus triage of ASC may be cost-effective in a low resource setting. These savings are most marked when this strategy is used for