ACANTHOSIS NIGRICANS IN HAWAIIAN CHILDREN VS NON-HAWAIIAN CHILDREN

Objective: To determine if Maui children of Hawaiian descent are more susceptible to acanthosis nigricans (AN) than non-Hawaiian children and to examine differences in BMI, blood glucose, lipoproteins, and blood pressure. Covariates included age, gender, height, waist circumference, and family history of diabetes.

Design: The design was cross-sectional and observational.

Setting: The screenings took place in four schools on the island of Maui, Hawaii.

Participants: 408 Hawaiian students and 450 non-Hawaiian students from 10–18 years of age participated in the study. The mean age of both the Hawaiian and non-Hawaiian participants was 11.7 years.

Results: All the data was analyzed to determine correlations between any of the health characteristics and AN in both groups, and to determine if any characteristics were more prevalent in Hawaiians vs non-Hawaiians. 17.2% of the Hawaiian participants had AN, whereas 10.4% of the non-Hawaiian participants had AN. Linear regression of each of the variables revealed a positive connection between AN and weight (P=.002), waist size (P =.001), and systolic blood pressure (P =.032) in non-Hawaiians. Linear regression studies in the Hawaiians showed positive correlation between AN and sex (P =.002) as well as AN and weight (P=.003). Furthermore, Hawaiians showed correlation between BMI and waist size (P =.015) and LDL (P =.001).

Conclusions: Children of Hawaiian descent are more susceptible to AN.

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INTRODUCTION

Acanthosis nigricans (AN) is a hyperpigmentation disorder that causes light-brown to black markings on the neck, under arms, in the groin, and any other skin folds. The hyperkeratotic markings are velvety plaques of discoloration, and small outgrowths also develop on affected areas.[1] Achrochordrons may also develop on the discolorations.[2] AN is due to insulin resistance and is highly correlated with hyperinsulinemia, type 2 diabetes, and obesity.[3] This study is the among the first AN research studies in Hawaiian children, a race well known for its high type 2 diabetes rates. There have been many research studies in the major non-White ethnic groups which also have high rates of type 2 diabetes. Studies with the major non-White ethnic groups with high diabetes frequency have shown high rates of AN as well. As childhood obesity rates increase, the appearance of AN earlier in life has also increased. The purpose of this investigation was to determine the presence of AN in Hawaiian children vs non-Hawaiian children and to identify associations with underlying health problems.

METHODS

Our observational participants were both Hawaiian and non-Hawaiian children on the island of Maui between the ages of 10 and 18 for both genders. There were 408 Hawaiian participants and 450 non-Hawaiian participants. All children in the selected schools were offered the free screening, and schools were chosen based on higher percentages of Hawaiian attendance. The mean age of both the Hawaiian and the non-Hawaiian children was 11.7 years. General practices were used to obtain weight, height, body mass index (BMI), fasting blood glucose, total cholesterol, triglycerides, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) levels, systolic and diastolic blood pressure, waist circumference and the presence of AN in all children. For blinding purposes blood pressure was recorded independently from AN presence. This was due to potential subjectivity in blood pressure measurements. Consent return rates ranged from a low of 19% to a high of 33% within schools. SPSS 12.0 data analysis was used to run descriptive statistics and t tests on each of the variables.

RESULTS

17.2% of the Hawaiian children had AN, and only 10.4% of non-Hawaiian children had AN. The Hawaiian children were taller, heavier, had larger waist sizes, higher fasting blood glucose levels, higher triglycerides, lower HDL, and higher systolic and diastolic blood pressure. The t tests revealed that in both sample populations participants with AN were taller, heavier, and had higher BMI, larger waist sizes, higher fasting blood glucose levels, higher total cholesterol, higher triglycerides, lower HDL, higher LDL, and higher systolic and diastolic pressure. Linear regression studies revealed a positive correlation between AN and gender (P=0.002), weight (P=0.003) in Hawaiians. In the non-Hawaiians linear regression showed a correlation between AN and height (P=.039), weight (P=.002), waist

size(P=.009), and systolic pressure (P=0.32).

Discussion

This study of AN was conducted among Hawaiians, a group known to have higher rates of type 2 diabetes and obesity. We found that children of Hawaiian descent were more susceptible to AN; they may be more likely to develop AN because of genotypic predisposition as well as cultural and social factors affecting the phenotypic expression of diabetes and associated disorders. Further research should investigate the relationship between the child's surroundings and diet with diabetes and AN rates. Further studies should compare Hawaiian children with other specific ethnic groups on Maui, as the non-Hawaiian category includes Caucasians and many non-White ethnic groups. Recommendations include increased use of BMI and growth charts by pediatricians and other healthcare practitioners to monitor, educate, treat and prevent obesity and associated diseases. In certain populations where prevalence of overweight starts as early as one year of age, pediatricians must use accurate and consistent calculations of BMI as an opportunity to prevent comorbidities.[4] The Hawaiian race is a dwindling race for many reasons and preventable diseases that can be reduced with education, awareness, and treatment could enhance the longevity of the Hawaiian race.

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