

ABSTRACT

Glucose-6-Phosphate Dehydrogenase Deficiency in a West Indian Diabetic Population

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Glucose-6-phosphate dehydrogenase deficiency is the most common enzymopathy known to man, affecting over 400 million people worldwide. The deficiency has been associated with conditions such as sickle cell anaemia, cancer and diabetes mellitus.

In this thesis, the status of the deficiency in Afro-Trinidadian and Indo-Trinidadian diabetic individuals and its impact on the development of related complications are presented in an attempt to determine the correlation between the deficiency and diabetes mellitus.

Four hundred diabetic patients (205 Afro-Trinidadians and 195 Indo-Trinidadians) and three hundred and one non-diabetic control subjects (151 Afro-Trinidadians and 150 Indo-Trinidadians) were tested for the deficiency by the determination of the red cell activity.

Results revealed that there is a significantly higher incidence of the deficiency ($p<0.0001$) among the Afro-Trinidadian diabetic patients when compared to Indo-Trinidadian diabetic patients (23.9% vs. 4.1%). The Afro-Trinidadian diabetic patients had a significantly higher incidence of the deficiency than their counterparts in the non-diabetic control group, which recorded a 13.3% incidence of deficiency ($p<0.012$). However, the reverse was observed in the Indo-Trinidadian population where the non-diabetic control group, which recorded a 12.7% incidence, had a significantly higher incidence of the deficiency than the diabetic group, which, as previously stated, recorded 4.1% ($p<0.003$). Based on these results, it is unlikely that the deficiency is correlated to diabetes in the Indo-Trinidadian population.

In the case of the Afro-Trinidadian population, the results suggest that there is a positive relationship between the deficiency and diabetes mellitus. This could have major implications in the type of medical treatment used with diabetic patients who are also G6PD-deficient. However, the exact nature of the relationship between the two disorders is still uncertain since no correlation between the deficiency and diabetic complications was observed.

Keywords: Glucose-6-phosphate dehydrogenase deficiency; diabetes mellitus; Afro-Trinidadian; Indo-Trinidadian; Trinidad.