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Haemoglobin Variants and Their Frequency Distribution in Human Population of Niger State, Nigeria

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Abstract : Haemoglobinopathy is a genetic disorder that has the potentiality to cause death of individuals in whom both the alpha (α) and beta (β) globin chains of the haemoglobin molecule are defective due to mutations in their genes. The haemoglobin genotype variants among some residents of Niger state, Nigeria, were determined using the secondary data available at Bida, Minna and Kotangora general hospitals of the state. A total of 1,639 data, representing 434, 655 and 550, collected from the outside patients who visited the medical laboratory units of the three general hospitals, respectively, over five years period (2015-2020) were analyzed into gene frequency, sex and age to determine their haemoglobin genotypes status. More males (51.6 – 58.7%) than females (41.3 – 48.4%) visited the three hospitals during the period covered and most of the patients were between 11 - 20 years old. The frequency of HbA allele in the human population was 0.72, 0.65, 0.68 for Bida, Minna and Kotangora, respectively, while it was 0.25, 0.29 and 0.28 for HbS allele. The HbC allele was prevalent at 0.03, 0.06 and 0.05 among the human population in Bida, Minna and Kotangora cities of Niger state. In overall, the prevalence of HbA, HbS and HbC alleles in Niger state of Nigeria was 0.68, 0.28 and 0.05. Minna being the capital city of Niger state and the most populous among the three cities in the state seems to have influx of more people who are carriers of abnormal haemoglobin genotypes which has resulted to higher frequency of HbS and HbC than those of the other two cities in this study. These results show that the pattern of haemoglobin genotypes frequency of Kontagora could be a prediction for the whole of Niger state. It is therefore necessary and important to take screening of blood for haemoglobin genotype serious among intending couples to prevent and reduce the possibility of having increase in the number of people with abnormal haemoglobin genotypes in the state.

Keywords : haemoglobin, genotype, niger state, gene frequency, general hospitals
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