2023 | Anthropo-Indialogs Vol. 3, No. 1, pp. 1-4

ISSN: 2583-1070 • *URL: www.arfjournals.com*
https://DOI:10.47509/AI.2023.v03i01.01

A Study on the Occurrence of Glucose-6-Phosphate Dehydrogenase Deficiency among the Brahmins of The Singrauli District of Madhya Pradesh

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Received : 20 December 2022 • **Revised :** 18 January 2023;
Accepted : 02 February 2023 • **Published :** 02 June 2023

Abstract: Glucose-6-Phosphate Dehydrogenase deficiency disorder is one of the inborn metabolic errors which cause RBCs to break leading to complications such as hemolytic Anemia. Mostly is remains undiagosed until exposure to oxidative medications and consumption of fava beans leads the development of symptoms and complications. The present study aims at identifying G6PD deficient individuals amongst the Brahmin caste group of Singrauli district of Madhya Pradesh. The study revieled that zero or no identification of deficient individuals amongst the caste group.

Keywords : G6PD deficiency, Brahmins, Madhya Pradesh, Metabolic inborn errors, Singrauli

Introduction

Glucose-6-Phosphate Dehydrogense (G-6-PD) deficiency is the most common disease-producing enzyme disorder of human beings. It was first discoverd when a case with consumption of Primaquine causing hemolytic anemia was found. The G6PD gene is located on the long arm of X-chromosome (Xq28) making it a X- linked recessive trait. It can cause free radical-mediated oxidative damage to red blood cells, leading to premature haemolysis (Lo, et al., 2019). The G6PD enzyme is one of the enzymes present in red blood cells, required in metabolism of carbohydrates. Human reb blood cell G6PD represents less than one part in 20000 of the protein of the red blood cell. At the present time it can be obtained in suffiicient purity detailed peptide analysis only after extensive purification of large volumes of blood. Bio chemical characterization

TO CITE THIS ARTICLE

Dwivedi, S.., & Nayak, J.K. (2023). A Study on the Occurrence of Glucose-6-Phosphate Dehydrogenase Deficiency among the brahmins of the Singrauli District of Madhya Pradesh, *Anthropo-Indialogs,* 3: 1, pp. 1-4. *DOI:10.47509 / AI.2023.v03i01.01*

has led to identification if 442 distinct varients of G6PD our of which 299 were characterized by methods agreed upon by WHO group. The first Case of G6PD in India Was Identified in 1963 by Baxi (Baxi, Balkrishnan, Undevia, & Sanghvi, 1963) In Indian Context the G6PD presents low prevalence in major sections the subcontinent (2-5%) but increases in the states of Chhattisgarh, Orissa and Jharkhand where prevalance reaches 5-25% (Howes, Battle, Satyagraha, Baird, & Hay, 2013); the common varients in the area are G6PD Meditteranean which is found majorly in north Indian population with mutation 1311 C in contrast to European, Middle-Eastern population which has a T at 1311 position (Beutler & Khul, 1990) (Saha, Ramzan, Tay, Low, Basair, & Khan, 1994). The Present study attempts to identify individuals with G6PD deficiency of the study group.

Materials and Methods

The study was conducted in the Singrauli district located on the eastern border of the state of Madhya Pradesh sharing borders with Uttar Pradesh and Chhattisgarh respectively between latitude 23°49' and 24° 42' north and longitude 81°18' and 82°48'. The district is of 5675 sq. Km in area with highest elevation of 609m above sea level in Chitrangi. The Present study was conducted on the Brahmins of Singrauli district which is a caste group of Hindu society.

The Blood was colleceted by the finger prick method of 33 Brahmins and stored in ETDA tubes for the analysis. Before Collecting the blood samples, written informed consent was obtainted from the subjects which informed them about the purpose and voluntary nature of the study. The analysis was conducted by the help of assay kits manufactured by ARKRAY healthcare pvt. Ltd. The procedure used for conducting this test was performed as per the instructions provided by the maker.

Results and Discussions

The analysis of all the 33 blood samples resulted in the findings that 96.96% of the samples showed absence of G6PD disorder among them where as 3.30% of sample showed an unconclusive result. The study concluded that the Brahmins of Singrauli distirct have absence of G6PD disorder but a larger study is required to asses the situation more presisely. As per the tests performed and results gathered it is evidant that the prevalence is zero in the study population. The Prevalence of Disorder in India varies from 1% to 27% in different regions and communities of the nation with higher frequency observed in the eastern region of India (Bhasin, M. K., 2006). The prevalence

of G6PD deficiency of comparitively with that of other castes and tribal population; in the Solan district of Himanchal and study amongst the Tamil Brahmins of Delhi resulted in the conclusion that there is low prevalence rate of G6PD deficiency among the caste groups of India with 2.12% males affected with G6PD disorder in Brahmins of Solan and similar results of 2.72% in case of Tamil Brahmins residing in Delhi (Kabita, Khurana, Saraswathy, & Sachdeva, 2011) (Saraswathy & Aggarwal, 2005).

The area being under malarial belt region, the medical practitioners don't go for the detection of G6PD deficiency as both are interlinked in manners. The government needs to implement new rules and schemes for identification of G6PD deficient individuals and also consider the change in treatment methodology of Malaria, since malarial drugs provide adverse effects on G6PD deficient individuals, pre testing and diagnosis of G6PD is a critical criterion be me considered. The need of Awareness programs as well as educational seminars by the government should be done for the purpose of awareness among the community and in the region. Free diagnosis and health checkup should be done by the government on a frequent basis time to time to determine the status of health among the community.

Reference

Baxi, A. J., Balkrishnan, V., Undevia, J. V., & Sanghvi, L. D. (1963). Glucose-6-Phosphate dehydrogenage deficiency in the parsee community . *Indian Journal of Medical Sciences* , 493-500.

Beutler, E., & Khul, W. (1990). The NT 1311 Polymorphism of G6PD: G6PD Mediterrranean mutation may have originated independently in Europe and Asia . *American Journa of Human Genetics* , 1008-1012.

Bhasin, M. K. (2006). Genetics of Castes and Tribes of India: Glucose-6-Phosphate Dehydrogenase Deficiency and Abnormal Haemoglobins (HbS and HbE). *International Journal of Human Genetics*, 6(1), 49-72. doi: 10.1080/09723757.2006.11885946

Devendra, R., Gupta, V. K., Shaumugam, R., Singh, M. P., Patel, P., Valecha, N., et al. (2020). Prevalence and spectrum of mutations causing G6PD deficiency in Indian populations . Infections, Genetics and Evolution , 1-10.

Jaiswal, A. (2004). Respiratory efficiency as affected by exposure to textile dust: health status evaluation of textile workers of district Varanasi, Utter Pradesh. Gene. Environment and Health, 135-162

Howes, R. E., Battle, K. E., Satyagraha, A. W., Baird, J. K., & Hay, S. I. (2013). G6Pd Deficiency: Global Distribution,Genetic Variants and Primaqunie Therapy. In *Advances inParasitology* (p. 155).

Jaiswal, A. (2012). Anthropo-Medical profile of Textile workers. Alfa Publications.

Lo, E., Zhong, D., Raya, B., Pestana, K., Koepfli, C., Lee, M.-C., et al. (2019). Prevalence and distribution of G6PD deficiency: implication for the use of primaquine in malaria treatment in Ethopia. *Malaria Journal*.

Saha, N., Ramzan, M., Tay, J. S., Low, P. S., Basair, J. B., & Khan, F. M. (1994). Molecular characterisation of red cell glucose-6-phosphate dehydrogenase deficiency in the north-west Pakistan. *Human Heredity* , 85-89.

Saraswathy, K. N., & Aggarwal, S. (2005). Study of Glucose-6-Phosphate Dehydrogenase Deficiency and Sickle Cell Anemia Among the Tamil Brahmins of Delhi. *Anthropologist*, 69-70.

World Health Organiasation. (1989). *Bulletin of World Heatlh Organisation.* Geneva: WHO.