



**ORIGINAL RESEARCH PAPER**

**Physiology**

**PREVALENCE OF HEMOGLOBINOPATHIES IN THE POPULATION OF DIBRUGARH AND IT'S ASSOCIATION WITH SEX**

**KEY WORDS:**  
haemoglobin, haemoglobinopathies

**Dr. Abanti Bora Baruah**

Associate professor of physiology, Assam Medical College, Dibrugarh  
Demonstrator Department Of Physiology Assam Medical College, Dibrugarh

**Dr. Rwitumita Bharali\***

Demonstrator of physiology, Assam Medical College, Dibrugarh  
Demonstrator Department Of Physiology Assam Medical College, Dibrugarh  
\*Corresponding Author

**ABSTRACT**

**Introduction-** Haemoglobinopathies are one of the commonest hereditary disorders in south-east Asia and pose a major health problem. The data of their prevalence in the society may help in the future prevention of health hazards. **Materials and method:-** Agarose gel electrophoresis was used to study the haemoglobin typing in 118 individuals. The Hb percentage was studied by cyanmethaemoglobin method. **Result:-** It was observed that prevalence of abnormal Hb was common in females as compared to males. And moreover in each type of Hb, the percentage of Hb was more in males as compared to females. **Conclusion:-** Prevalence of abnormal Hb is common in Dibrugarh, their early detection can help in preventing serious health hazards.

**INTRODUCTION:**

Hemoglobinopathies are the inherited disorders of haemoglobin which are the most studied pathologies. These genetic disorders are considered a very important health care threat in many tropical countries. 1. These diseases cause major health burden in South East Asian, particularly in India. These disorders are caused by genetic mutation in the globin gene sequence, resulting in a spectrum of clinical manifestations ranging from asymptomatic carrier state to major disease, requiring repeated blood transfusions and associated increased morbidity and mortality. The prevention of these disorders lies in effective screening of at-risk population, namely premarital men and women and anti-natal women. Various studies have been done in the past which have showed different prevalence patterns of these diseases in different parts of the country. 2,3,4. Therefore this study was undertaken to study the prevalence of abnormal haemoglobin in the population of Dibrugarh and its relation with sex of the individual.

**Materials and Methods:-**

In this cross-sectional study 118 young individuals in the age group of 9-19 years were selected from the general population of Dibrugarh randomly. The ethical committee clearance and an informed consent of the subjects were taken. Subjects with a history of blood transfusion within last four months and age group outside the defined age range were excluded. The study was conducted in the department of Physiology, Assam Medical College, Dibrugarh.

4 ml of venous blood were collected in the EDTA vacutainer from each subject. The hemolyte is prepared fresh on the same day the electrophoresis is performed. The sample is prepared by washing the red blood cells lysing the cells and pipetting the hemolyte. The hemolyte is made to run on Agarose gel electrophoresis. Hb S was confirmed by sickling test using 2% sodium metabisulphite. The foetal haemoglobin was estimated by alkalidenaturation technique. The total haemoglobin in blood was estimated by cyanmethaemoglobin method.

Statistical analysis of data was carried out using SPSS Version 16. Data were presented in the forms of mean ± standard deviation and Statistical significance was ascertained by unpaired T-test.

**Result and Observation:-**

The relative prevalence of different hemoglobinopathies in the study population is shown in table 1. The distribution of

haemoglobin types in relation to sex is shown in Table 2, it is seen that percentage of HbA/A in males is more than females. Whereas the percentage of HbA/E, HbE/E, HbE/F, Hb A/S and HbS/S is more in female than in male. Table 3 shows the mean ± SD levels of haemoglobin in different haemoglobin types with respect to sex. It is seen that haemoglobin level is more in males as compared to females in HbA/A and HbE/E which was statistically highly significant. For the type HbE/E although Hb level is more in males as compared to females but the increase was not statistically significant. Comparison was not done for Hb A/S, Hb S/S and Hb E/F as the number of cases were very less.

**Table 1:- Relative prevalence of different hemoglobinopathies in the study population**

Types of haemoglobin	HbA/A	HbA/E	HbE/E	HbA/S	HbS/S	HbE/F	total
No of Cases	81	24	8	2	2	1	118
% of cases	68.64	20.33	6.78	1.69	1.69	0.85	100

**Table 2:- The distribution of haemoglobin types in relation to sex**

Sex	total	HbA/A	HbA/E	HbE/E	HbA/S	HbS/S	HbE/F
Male	65	49	11	3	-	1	1
	100%	75.38%	16.92%	4.62%	-	1.54%	1.54%
Female	53	32	13	5	1	1	1
	100%	60.38%	24.53%	9.43%	1.89%	1.89%	1.89%

**Table 3:- Shows the mean ± SD level of haemoglobin in different haemoglobin types with respect to sex**

Type of haemoglobin	HbA/A mean ± SD	HbA/E mean ± SD	HbE/E mean ± SD
male	14.2 ± 0.82	9.7 ± 0.2	8.1 ± 1.6
female	11 ± 1.1	8.6 ± 0.23	6.3 ± 1.15

**Table 4:- showing the comparison between different types of haemoglobin in relation to sex**

categories	significance
male HbA/A vs female HbA/A	HS
male HbA/E vs female HbA/E	HS
male HbE/E vs female HbE/E	NS

{p value > 0.05 was non-significant (NS); p value < 0.05 was as significant (S); p value < 0.01 was highly significant (HS); p value < 0.001 was very highly significant (VHS)}

#### DISCUSSION:-

Hemoglobinopathies are a growing global public health problem with an estimated 9,00,000 births of clinically significant thalassemia disorders expected to occur in the next 20 years.<sup>5</sup> The present study shows a high prevalence of haemoglobinopathies in females as compared to males. The present study showed that the prevalence of Hb A/E is 20%. And the prevalence of Hb E/E is 6.7%. This finding is inconsistent with the findings of Beutler E et al<sup>6</sup> and Flatz G<sup>7</sup>. Studies have shown that there is very high incidence of haemoglobinopathies in paediatric age group (0-18 years) as 55.7%.<sup>8</sup> This is very well correlated with our study. HbE is the most popular haemoglobin variant in Southeast Asia as well as in Northeast India. High prevalence of haemoglobin E (>50%) were observed among the Soui, Thai Khmer, So, Yor and Puthai populations inhabiting the region near Cambodia and Laos, higher frequency of HbE in the Phayeng (a Chakpa) of Manipur can be taken as a favour on the hypothesis of association of Austroasiatic race and HbE.<sup>9</sup>

#### CONCLUSION:-

The frequency of hemoglobinopathy is increased by consanguinity & endogenous mating and the tribal community in India are facing the problem at large scale. Therefore early screening for haemoglobinopathies and counselling will lead to a decrease in this serious group of diseases and reduce the burden of the future generation.

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