

Incidence of NESTROFT - Positives and Haemoglobin S Among the Lotha Nagas of Nagaland

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INTRODUCTION

The present study was carried out among the Lotha Naga- a scheduled tribe of Wokha village, district Wokha, Nagaland. Their population numbering 82,612 souls (Census of India, 1991) is scattered over an area of 1,628 sq. km with a population density of 51 persons per sq. km. The present study aims at understanding (i) incidence of NESTROFT positive and sickle cell haemoglobin among the Lothas and (ii) generational variation, if any, with respect to these traits among them.

In 1981, Kattamis et al. detected individuals with heterozygous thalassaemia on the basis of Naked Eye Single Tube Red Cell Osmotic Fragility Test (NESTROFT). This simple and inexpensive test has been used for population surveys by recent researchers. Kattamis et al. (1981) and Raghavan et al. (1991) reported that common haemoglobinopathies like HbE and HbS can be detected through NESTROFT. The NESTROFT method was evaluated against a high performance liquid chromatographic (HPLC) method for screening thalassaemia and other abnormal haemoglobins (Thomas et al., 1996).

MATERIALS AND METHODS

A total of 315 blood samples were collected at random from individuals of either sex and of all ages. One day before going to the field the sterile sample collecting tubes were rinsed with EDTA (0.5% w/v). In the field, 2 to 3 drops of blood were collected from each individual by pricking the middle finger using a disposable sterilized lancet. The properly labelled blood samples were then placed in an icebox and transported to the field laboratory. For the detection of other haemoglobinopathies, including thalassaemias, nestrof test as given by Thomas et al. (1996) was used. The slide method of Daland and Casetle (1948) using 2%

sodium metabisulphite solution was used to detect the presence of sickle cell haemoglobin in the collected blood samples.

RESULTS AND DISCUSSION

The results respectively are set out in the tables 1 and 2 and figure 1.

Table 1 shows the distribution of NESTROFT positives and negatives among the Lothas. It is seen that 12.70% were NESTROFT positive, 83.49% were NESTROFT negative and 3.81% were doubtful in respect of this genetic trait indicator (Figure 1). Sex-wise distribution revealed that in males, the percentage of positive (13.77%) and doubtful (4.19%) NESTROFT were higher among the females i.e. (11.49%) and (3.38%), respectively. However, NESTROFT negative is found to be higher in females (85.14%) as compared to the males (82.04%). But since NESTROFT is an autosomal trait the difference between sexes may be only a matter of chance.

No other data based on NESTROFT among any of the Naga population is available for comparison.

Sickle Cell Haemoglobin

In the present study (Table 2) not a single case of sickle cell haemoglobin is found in both Lotha males and females. In respect of this genetic trait also no other study has been conducted on other Naga population of Nagaland.

A fairly high incidence of NESTROFT positive (12.70%) and quite a few NESTROFT doubtful cases (3.81%) suggest a high frequency of haemoglobin abnormalities including thalassaemia among the Lothas. But surprisingly, no sickle cell haemoglobin has been detected in the population. This points to a possibility of presence of other haemoglobinopathies such as β -thalassaemia, HbE and G-6-PD deficiency.

In the world context, HbS trait is prevalent in Africa and with lesser frequencies in the

Table 1: Distribution of NESTROFT results among the Lothas

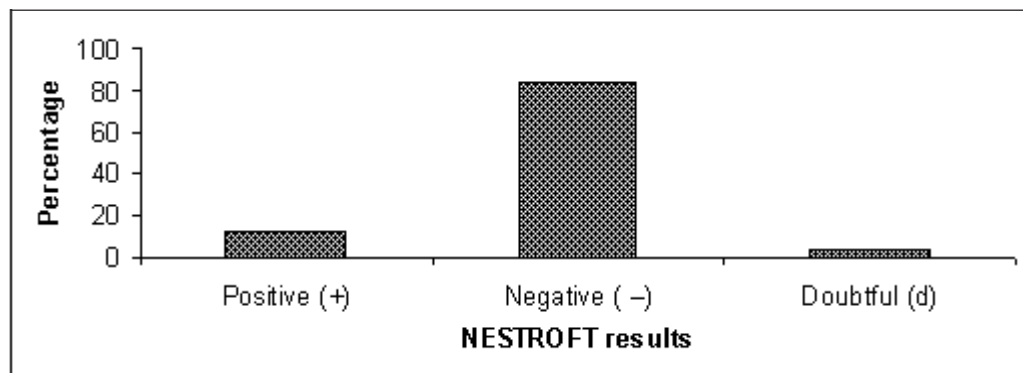
Sex	No. Tested	NESTROFT results					
		Positive		Negative		Doubtful	
		No.	%	No.	%	No.	%
Male	167	23	13.77	137	82.04	7	4.19
Female	148	17	11.49	126	85.14	5	3.38
Total	315	40	12.70	263	83.49	12	3.81

Table 2: Distribution of sickle cell haemoglobin among the Lothas

Sex	Number Tested	HbAS Positive	%	HbAS negative	%
Male	147	0	0	147	100
Female	133	0	0	133	100
Total	280	0	0	280	100

Mediterranean, Saudi Arabia and also India where the average frequency of HbS is 0.031. Sickle cell in India was first detected in the Nilgiri hills (Lehmann and Cutbush, 1952). It has been found that sickle cell in India is present in high frequency among the scheduled tribes (0.054) as compared to other ethnic groups - scheduled castes (0.024) and other communities (0.011). In the west, central and south India, this trait is found to be sporadically distributed among tribal populations such as among the Bhil, Gond, Khond, Kurumba, Irula and Paniyan. But in the north and north eastern region sickle cell is absent (Bhasin et al., 1994). On the other hand, high prevalence of G6PD deficiency and HbE haemoglobin has been observed in the north eastern states of India. Seth and Seth (1971)

have reported incidence of glucose-6-phosphate dehydrogenase deficiency among the Angami Nagas of Nagaland, Das et al. (1975, 1980a and 1980b) and Saha (1990) have also reported that haemoglobin E is predominant among the mongoloid populations of Assam. Further, Flatz et al. (1972), Das et al. (1982) and Saha et al. (1990) have reported high incidence of glucose-6-phosphate dehydrogenase deficiency in Assam population. In 1994, Bhasin et al. have estimated the frequencies of abnormal haemoglobins among the tribal populations of Assam (HbE = 0.303; HbS = 0.000), Manipur (HbE = 0.066; HbS = 0.000), Meghalaya (HbE = 0.363; HbS = 0.000) and Sikkim (HbE = 0.006; HbS = 0.000). In view of such a high incidence of NESTROFT positives (12.70%) among the Lothas, it may be inferred that the Lotha Nagas too may carry among them b-thalassaemia and/or HbE and / or G-6-PD deficiency as they are devoid of HbS, and for this further in-depth studies are called for to precisely locate the 'why' of NESTROFT positives so that the population health planners may design their health strategy to combat the genetic health hazard involved.

**Fig. 1. Percentage distribution of NESTROFT results among the Lothas**

KEYWORDS NESTROFT. Abnormal Haemoglobins. Lotha Nagas. Nagaland

ABSTRACT Naked eye single tube osmotic fragility test (NESTROFT) was performed on the blood samples of 315 randomly selected Lotha individuals. 280 individuals were also tested for the presence of sickle cell haemoglobin. 12.70 percent NESTROFT-positive and 3.81 percent doubtful cases were detected. Not a single case of HbS was found.

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