

G-6-PD DEFICIENCY IN THE POOTAI AND THE SO COMMUNITIES IN NORTHEAST THAILAND

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INTRODUCTION

Southeast Asia is an area where glucose-6-phosphate dehydrogenase (G-6-PD) deficiency is very common (WHO, 1967). In northeast Thailand the distribution of this X-linked genetic defect is remarkably heterogenous with an incidence ranging from 8% to 24% (GAT, 1981). This anomalous distribution is determined by variation in the ethnic backgrounds of the people and/or discriminating selective pressure (Panich, 1981; Sutton, 1963). Since northeast Thailand is populated with at least 20 ethnic groups (Suwasdi, 1976), studies were carried out to determine G-6-PD deficiency and its variants in these sub-population groups. This paper presents the distribution of G-6-PD deficiency amongst 2 different ethnics in northeast Thailand, the Pootai and the So.

MATERIALS AND METHODS

The study was carried out in June 1983 and covered 6 rural villages in Pannanikom

district of Sakon Nakhon province, northeast Thailand. Four villages were populated mainly with the Pootai (over 80%), while the other two were mainly of the So (over 80%)

The subjects were 656 healthy school children (358 boys and 298 girls) aged between 6 to 13 years old. Their biodata were recorded from the school registration books: name, age, sex, date and place of birth. In addition, ethnic affiliation of the subjects was traced back up to of, the parents by questioning the school teachers residing in each village.

Blood samples were collected by venipuncture and kept in ice until it was tested. Al-sever's solution as described by Demetriou *et al.*, (1974) was used as anticoagulant and preservative of G-6-PD activity in red blood cell.

Red blood cell G-6-PD deficiency was determined within 24 hours after collection and by methemoglobin reduction test as described by Knutsen *et al.*, (1966).

Table 1
Distribution of G-6-PD deficiency amongst two ethnic groups in 6 villages.

Villages	Ethnic majority	Male		Female	
		No. exam.	No. Def.	No. exam.	No. Def.
Kha Mint	Pootai	44	8	54	8
Tha Song Korn	Pootai	50	4	69	8
Na Ta Kang	Pootai	90	6	78	8
Bha Thong	Pootai	83	5	59	2
Hin Tag	So	28	2	32	2
Come Whae	So	54	4	39	1

Table 2

Distribution of G-6-PD deficiency subjects in the Pootai and the So.

Ethnic group	Male		Female		Male		Female	
	No. exam.	No. exam.	No. Def.	%	No. Def.	%	No. Def.	%
Pootai	207	237	20	9.7	19	8.0		
So	44	35	1	2.3	0	-		

RESULTS

Distribution of G-6-PD deficiency subjects from 6 villages is shown in Table 1. The percentage of G-6-PD deficiency was 6.0 to 18.8 in males and 2.6 to 14.8 in females. When the subjects were grouped according to their ethnic backgrounds (Table 2), the distribution of G-6-PD deficiency amongst the Pootai was 9.7% in males and 8.0% in females, while amongst the So it was found to be 2.3% and only in the males.

According to Hardy-Weinberg equilibrium, the expected number of G-6-PD deficiency in female heterozygotes was 41.4 for the Pootai and 1.6 for the So.

DISCUSSION

Ethnic composition of the people of Thailand and racial backgrounds of the Pootai and the So have been briefly described by Flatz *et al.*, (1964) and Suwasdi (1976) respectively. Table 1 shows that prevalence of G-6-PD deficiency observed was heterogeneous amongst the communities studied though some of the villages population was of the same majority ethnic group e.g. the Pootai. This finding could not be explained since complete racial background of the whole population in each village has not been thoroughly examined.

In these ethnic groups, the G-6-PD deficiency was found to be remarkably high for the Pootai (9.7% in males) while it was

only 2.3% for the So (Table 2). Our data now confirms numerous reports showing the differences in G-6-PD deficiency amongst different races (Flatz and Sringam, 1964; Bowman *et al.*, 1971; Panich, 1981). The percentage of G-6-PD deficiency of the Pootai males was similar to that of the Laos-speaking Thai (the Thai-Laos) examined by Flatz *et al.*, (1964) and Wasi *et al.*, (1967). The dialect and cultural practices of the Pootai and the Laos-speaking Thai are very similar (Suwasdi, 1976). Thus in finding that their G-6-PD deficiency patterns are similar probably suggest these two races are actually the same or very closely related, otherwise they may have intermixed to the level of an equilibrium. We have also observed similarity in hemoglobin E frequency between the Pootai and the Laos-speaking Thais (Unpublished data).

It is of interest to draw attention to the So population of which the G-6-PD deficiency was only 2.3% and was found only in male subjects (Table 2). Although the So and the Pootai communities in our studies are only about 20 kilometers apart, they are different ethnically. The Pootai speak a dialect of the Thai family while the So speak an Austroasiatic language group similar to the Cambodian. Furthermore, their ways of living are obviously different. These selective pressures would perhaps cause seldom intermixing between the So and other races thus the introduction of this genetic defect to the So population is inevitably limited.

The prevalence of G-6-PD deficiency amongst the Pootai females as detected by our screening method was only 20 whereas the expected was 41.4. This result showed that our methemoglobin reduction test could diagnose approximately 50% of all heterozygous females. Thus the finding confirmed WHO (1967) report on the summary of screening methods for G-6-PD deficiency.

SUMMARY

The distribution of G-6-PD deficiency amongst two ethnic groups the Pootai and the So in northeast Thailand were studied. The prevalence of G-6-PD deficiency amongst the Pootai males was 9.7% while that amongst the So males was only 2.3%.

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