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# Sickle Cell Haemoglobin and G-6-PD Deficiency in Manne Dora Tribe of Andhra Pradesh

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ABSTRACT Sample of 190 (99 males and 91 females) indvidual of Manne Dora tribe was screened for haemoglobin and G-6-PD deficiency. Among them eight cases of sickle cell trait and five males were found to show G-6-PD deficiency.

## INTRODUCTION

Haemoglobin is one of the most widely studied protein in human populations. Several studies have reported the incidence of sickle cell haemoglobin among tribal populations (Kate and Verma, 1989). But most of the reports showed no record of G-6-PD deficiency although the trend has started recently (Rao and Goud, 1979; Naik and Ishwad, 1989). The prevalence of sickle cell and G-6-PD deficiency is found to be high in malarial endemic areas.

The present investigation is aimed to study the incidence of sickle cell trait and G-6-PD deficiency in Manne Dora tribe settled in plains.

## MATERIALS AND METHODS

Intravenous blood samples were collected form 190 healthy adults (99 males and 91 females) aged between 20-60 years from eleven villages of Visakhapatnam and Vizianagaram districts of Andhra Pradesh. Haemoglobin and G-6-PD patterns were detected using cellulose acetate Titan-II plates (Helena Labs, Beaumount, Texas) following Elvis and Aplerin (1972).

## RESULTS AND DISCUSSION

Table 1 presents phenotype and gene frequency of haemoglobin. Of all the samples tested for haemoglobin, only eight cases of sickle cell triat has been observed. No case of sickle cell anaemia is encountered. The occurrence of sickle haemoglobin is ubiquitous in tribal populations. While in caste populations the $HB^S$ gene is either absent or record low frequencies. However, the frequency of $Hb^S$ gene varied from 0.25% in Chenchu (Ramesh et al., 1980) to 18.32% observed in Pardhan (Rao and Goud, 1979).

**Table 1: Haemoglobin phenotype and gene frequency**

| *Genetic marker* | *Phenotype* | *No.* | *Per cent* | *Gene Frequency* |
|---|---|---|---|---|
| Hb | AA | 182 | 95.79 | $Hb^A$ - 0.9789 |
| | AS | 8 | 4.21 | $Hb^S$ - 0.0211 |
| | SS | | | |
| | | 190 | 100.00 | 1.0000 |

Table 2 presents the incidence of G-6-PD deficiency. Only five males out of 99 are found to exhibit G-6-PD deficiency. The rest of the sample

showed normal B phenotype as is found in other Indian populations. Among Andhra tribal populations, the G-6-PD deficiency is found to be highest (12.38%) in Raj Gond (Pingle, 1984) while Naikpod (Rao and Goud, 1979) showed lowest (1.16%) incidence. In addition to tribal populations, scheduled castes recorded rather high incidence of G-6-PD deficiency. However, it is to be pointed out that the enzyme offers selective advantage in malarial endemic areas, but has been responsible for their mortality and morbidity. Unlike other genetic discorders, G-6-PD deficiency is benign until exposed to primaquine related drugs. It is imperative on the part of medical personnel of malaira eradication programme to test individuals for G-6-PD deficiency before adhering to primaquine, if not the reaction yet times may be fatal.

**Table 2: Distribution of normal and deficient G-6-PD**

| *Genetic marker* | *Sex* | *Phenotype* | *No.* | *Per cent* | *Gene* | *Frequency* |
|---|---|---|---|---|---|---|
| G-6-PD | Males | Normal | 94 | 94.85 | $Gd^{B+}$ | 0.9858 |
| | | Deficient | 5 | 5.05 | | |
| | Females | Normal | 91 | 100.00 | $Gd^{B-}$ | 0.0142 |
| | | Deficient | | | | |

It is worthwhile to mention that the uniform distribution of Hb and G-6-PD in all tribal groups studied along with their geographical distribution of malaria supports Allison (1960) hypothesis that sickle cell trait and G-6-PD deficiency offers selective advantage against malaria. However, there are objections to the malaira hypothesis, in order to explain the prevalence of these markers in Indian populations, are the absence of sickle cell gene in high malarious environment and the presence of sickle cell in plains. Interestingly, Manne Dora population which inhabits the plains of coastal districts, *viz.*, Vishakhapatnam and Vizianagaram and the presence of $Hb^S$ gene in them is a moot point. Whatever may be factors responsible for the presence of sickle haemoglobin is a major health problem confronting tribal groups demanding urgent attention.

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