

## Blood Groups and Sickle Cell Haemoglobin in Kapu Chakali— A Caste Population of Andhra Pradesh

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**ABSTRACT** The Kapu Chakali, an endogamous caste population of Andhra Pradesh was studied for ABO and Rh (D) blood groups and sickle-cell haemoglobin. A preponderance of blood group A over B and a low frequency of Rh (D)-ves were observed. The sickle cell trait was observed with a frequency of 6% which is high compared to other caste populations of Andhra Pradesh.

### INTRODUCTION

The Indian population is comprised of about 4,000 endogamous groups which show enormous variation in terms of language, marriage practices, food habits and in several other socio-cultural practices (Malhotra and Gadgil, 1984). These population groups provide an unique opportunity to study their genetic structure. This paper reports the distribution of ABO and Rh (D) blood groups and sickle-cell haemoglobin in Kapu Chakali an endogamous sub-population of the Washermen caste (Chakali) of Andhra Pradesh.

### MATERIAL AND METHODS

Blood samples were collected by finger prick method in ACD solution from 102 healthy, unrelated adults inhabiting two localities of Visakhapatnam, Andhra Pradesh. These were tested for serogenetic markers viz., ABO and Rh (D) with respective antisera, and screened for sickle-cell haemoglobin using starch-agarose gel electrophoretic method of Bhatia (1986) employing TEB buffer pH 8.6. The allele frequencies in the ABO system were estimated after Balakrishnan (1988), for Rh (D) and haemoglobin

were calculated using square root and gene counting methods, respectively (Mourant et al., 1976).

### RESULTS AND DISCUSSION

The phenotype and allele frequencies for blood groups and haemoglobin are presented in table 1. The present population exhibits a high incidence of the A blood group in contrast to Majumdar's (1980) report showing a substantial number of Indian populations have comparatively high incidence of B blood group. Infact; Brahmins (Naidu and Veerajuu, 1982; Srikumari, 1985) and Gollas (Narahari et al., 1982) from this state have also shown a preponderance of A blood group. In the Rhesus blood group system, the Rh (D) phenotype with rather low frequency (0.98%), whereas the range observed among other Andhra castes is 0-9.75%. On the other hand, sickle cell trait (AS) was detected with a frequency of 6% which is relatively high compared to other caste populations reported so far from Andhra Pradesh.

It is interesting to observe the presence of sickle-cell trait in Kapu Chakali - a caste which inhabits the plains of Andhra Pradesh. In addition, several other caste populations have also shows the presence of this trait (Ramaswamy, 1984). In the absence endemicity of malaria, it may be suspected that the sickle-cell allele might have entered into the caste populations from the tribes. In order to understand the origins and spread of sickle cell allele among caste populations of Andhra Pradesh, it is necessary to undertake DNA haplotype analysis in both tribal and caste populations of Andhra Pradesh.

**Table 1: Distribution of blood groups and haemoglobins in Kapu Chakali**

| Genetic marker/Phenotype | Number observed | Allele Frequencies     |
|--------------------------|-----------------|------------------------|
| <i>ABO</i>               |                 |                        |
| O                        | 40 (39.22)      | A 0.2069               |
| A                        | 27 (26.47)      | B 0.1875               |
| B                        | 24 (25.33)      | O 0.6056               |
| AB                       | 11 (10.78)      |                        |
| Total                    | 102 (100.00)    | 1.0000                 |
| <i>Rh (D)</i>            |                 |                        |
| +vc                      | 101 (99.02)     | D 0.9010               |
| +ve                      | 1(0.98)         | d 0.0990               |
| Total                    | 102 (100.00)    | 1.0000                 |
| <i>Haemoglobin</i>       |                 |                        |
| AA                       | 96(94.12)       | Hb <sup>A</sup> 0.9706 |
| AS                       | 6 (5.88)        | Hb <sup>S</sup> 0.0294 |
| Total                    | 102 (100.00)    | 1.0000                 |

\*Figures in parenthesis indicate percentage

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