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DISTRIBUTION OF PLACENTAL ALKALINE PHOSPHATASE PHENOTYPES AMONG FEW SCHEDULED CASTE GROUPS OF ANDHRA PRADESH

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Key words : Alkaline phosphatase, placenta, phenotypes, gene frequencies.

A total of 546 placental samples have been typed electrophoretically for Alkaline phosphatase phenotypes and gene frequencies. There were 112 Paky, 181 Madiga, 101 Mala and 152 Mochi placentae. They all belonged to lower caste Telugu-speaking Hindus of Andhra Pradesh. All the six common phenotypes of Alkaline phosphatase namely S, F, I ,SF, SI and IF have been encountered. The distribution of gene frequencies suggest hardly any caste differentiation in respect of $P1^i$ allele. However, the other two alleles $P1^s$ and $P1^f$ show a slight differentiation which is not significant.

INTRODUCTION

The enzyme placental Alkaline phosphatase is a membrane bound glycoprotein that hydrolyses a variety of phosphate esters having high pH optima (Mc Comb *et al.*, 1979). The human placental Alkaline phosphatase gene 1 and gene 2 are present on the long arm of chromosome 2 (Kam *et al.*,1985; Martin *et al.,* 1987). The enzyme is a dimer with a Mol. wt of 116,000 (Gottileb and Sussman, 1968).

Boyer (1961, 1963) was the first to demonstrate the genetic polymorphism of human placental alkaline phosphatase. Later, it was demonstrated that it is determined by many alleles at an autosomal locus of the fetal genotype (Robson and Harris, 1967). This enzyme displays an exceptional degree of heterozygosity compared with other polymorphic enzymes and the reasons for this are not clearly known (Harris *et al.,* 1974). Most of the alleles are individually rare. Thus, in all populations, there are three alleles $P1^s$, $P1^f$ and $P1^i$ with frequencies greater than 0.01. The present study reports the distribution of alleles of alkaline phosphatase among few scheduled caste groups of Andhra Pradesh.

MATERIALS AND METHODS

Placental samples were collected from different maternity hospitals and dwellings of East and West Godavari districts. The 546 placental samples collected include 181 from the Madiga, 112 from Paky, 101 from Mala and 152 from Mochi caste groups. Small samples of the tissue were collected separately into small polythene bags and immediately kept in a thermos flask containing ice. Later, they were taken to the laboratory, washed free of blood and stored at -20°c until used. The electrophoretic typing of alkaline phosphatase was carried out following essentially the method as described by Sree Ram Kumar and Rao (1982). For the electrophoretic study, homogenates were prepared by grinding 1 to 2 gms of placental tissue with an equal volume of distilled water in a teflon homogenizer held in ice. Later the homogenates were centrifuged at 3000rpm for 20 minutes. The clear supernatants were separated and used for electrophoresis.

RESULTS & DISCUSSION

The distribution of phenotypes and gene frequencies as found in the present investigation in the scheduled caste groups studied are presented in Table-1. The gene frequencies have been estimated by the gene counting method. All the caste groups studied showed the six common phenotypes. However, no rare phenotypes were observed.

The trends of the gene frequencies as seen in Table-1 suggest hardly any caste differentiation in respect of the distribution of the $P1^i$ allele. The other two common alleles $P1^s$ and $P1^f$ show a slight caste differentiation which is not significant. Thus the different scheduled caste groups reported in the present study resemble the caucasoids.

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