

Red Cell Glyoxalase I Polymorphism Among Madigas of Andhra Pradesh

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ABSTRACT The distribution of glyoxalase I (GLO I) polymorphism in Madigas, a Scheduled Caste population of Visakhapatnam of Andhra Pradesh has been investigated. The frequency of GLO^1 allele is reported to be 0.2825. The results are compared with those of other Andhra populations.

INTRODUCTION

Red cell enzyme glyoxalase I (GLO I) catalyses the irreversible conversion of glutathione and methylglyoxal into S-lactoyl-glutathione. Genetic polymorphism of the enzyme in man was first reported by Kompf et al. (1975), who demonstrated three phenotypic patterns GLO 1-1, 2-1 and 2-2 controlled by two common autosomal codominant alleles GLO^1 and GLO^2 . A few variants due to rare alleles have been reported (Ranjani et al., 1979; Beretha et al., 1983), and there is evidence also for the existence of a silent allele (GLO^0) at the GLO locus in certain populations (Rittner and Weber, 1978).

In the present paper we report the distribution of GLO I phenotypes among Madiga, a Scheduled Caste population of Viskhapatnam in Andhra Pradesh.

MATERIAL AND METHODS

Blood samples were collected by finger prick into ACD solution from 200 randomly selected unrelated individuals belonging to Madiga, a Scheduled Caste of Viskhapatnam City. Fresh and clear haemolysates were prepared according to standard procedures for GLO I typing. Electrophoresis was performed

essentially as described by Pflugshaupt et al. (1978), and the zones of enzyme activity were detected by the technique of Parr et al. (1977).

RESULTS AND DISCUSSION

The distribution of phenotypes and gene frequencies of glyoxalase I among Madigas is presented in table 1.

The GLO 2-2 phenotype records the highest incidence (55.50), followed by GLO 2-1 (32.50%) and GLO 1-1 (12.00%) phenotypes. The GLO^2 allele shows higher value (0.7175) than the GLO^1 allele (0.2825). The Chi-square test for goodness of fit between observed and expected phenotypes is statistically significant ($\chi^2=7.867$; d.f.1; $0.01 > p > 0.001$).

Considering the earlier reports from Andhra Pradesh (Chahal, 1981; Kumar and Rao, 1982; Veerajulu et al., 1982; Naidu et al., 1985; Char and Rao, 1986; and Muralidhar et al., 1989) the range of GLO^1 allele frequencies in castes of Andhra Pradesh is found to be between 0.1941 and 0.3565, while it is to be between 0.0000 to 0.2061 in tribes. Now it is evident that the present study more or less falls within the range.

Table 1: GLO I phenotypes and gene frequencies in Madigas

Phenotype	Observed number	Observed percentage	Expected number	Gene frequency	χ^2
1-1	24	12.00	15.96	GLO^1	0.2825
2-1	65	32.50	81.08	GLO^2	0.7175
2-2	111	55.50	102.96		
					7.867
					d.f. 1
					0.01 > P > 0.001

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