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Polymorphism of the Third Component of Human Complement (C3) in Haryana, India

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ABSTRACT Using high voltage electrophoresis, C3 component of the human complement has been studied in a total of 95 plasma samples from the people of Haryana, a North Indian State.

INTRODUCTION

The third component of complement (C3 or β_1C-globulin) plays a key role in the complement activation sequence (Porter, 1984). The polymorphism of C3 in human plasma was first reported by Roparzt et al. (1965) by agglutination inhibition test using erythrocytes coated with C3. Later, using high voltage electrophoresis Alper and Propp (1968) and Azen and Smithies (1968) independently demonstrated the polymorphism in C3. Although the polymorphism of this plasma protein has been extensively studied in most human populations of the world, for India only a few such studies have been reported (Sahai et al., 1978; Walter et al., 1978; Papiha et al., 1979, 1980; Papiha and Aggarwal, 1980; Chahal and Papiha, 1981; Papiha, 1981; Sehajpal et al., 1984; Char et al., 1985), and in fact no such data are available on the local populations of Haryana. Therefore, the aim of this paper is to report the baseline data on the distribution of C3 phenotypes and allele frequencies in a sample of Haryana population.

MATERIAL AND METHOD

Plasma samples from 95 healthy and unrelated individuals belonging to various Hindu caste groups of Haryana State were typed for C3 phenotypes by high voltage agarose gel electrophoresis in veronal buffer essentially as described in Alper and Propp (1968), within 48 hours of collection.

RESULTS AND DISCUSSION

The distribution of the C3 phenotypes and allele frequencies is presented in table 1.

Table 1: C3 phenotypes and allele frequencies in Haryana

Phenotypes	*Observed number*	*Expected number*	*Allele frequency*
S	76	75.25	$C3^S = 0.89$
SF	17	18.60	$C3^F = 0.11$
F	2	1.15	

The observed numbers of phenotypes are in close agreement with those expected assuming Hardy-Weinberg equilibrium ($\chi^2_1 = 0.78; 0.50 > P > 0.30$). No rare variant was found. The C3 allele frequency in the Haryana sample is 11%. There are limited data on C3 variation in India and the studies carried out so far have shown that the frequency of the $C3^F$ allele varies from 4.4 to 11.4% (Char et al., 1985), albeit it has been reported as low as 1.5% in mixed population of

Delhi (Sahai et al., 1978) and as high as 14.1% in a heterogeneous sample from Punjab (Papiha, 1981). Thus, the frequency observed in the present study fits well within this Indian range. To derive any meaningful conclusions from the variation of this important plasma protein in Haryana will of course require further investigations of different population groups of the State.

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