LETTER TO THE EDITOR

ASSOCIATION OF HAPTOGLOBIN TYPES WITH ARTERIAL BLOOD PRESSURE*

Sir,

(Received on December 2, 1996)

Haptoglobin (Hp) is a haemoglobin binding α-2 globulin in serum. The genetic polymorphism of the protein is controlled by two codominant alleles, Hp1 and Hp2 located on the long arm of chromosome-16, among which Hp2 is predominant. Studies have been taken up for association of haptoglobin phenotypes with several diseases. A high frequency of Hp 1-1 phenotypic patterns are found in haemolytic anaemia as compared to Hp 2-2 and Hp 2-1 (1, 2). The high frequency of Hp 2-2 patterns was found in retinal detachment (3) and pulmonary adenocarcinoma (4). The influence of this serum protein on serum lipid levels (5) as well as atherosclerotic risk (6) is also well established. In another study (7), an increased risk was attributed to Hp 2-2 phenotype for essential hypertension and hypertension associated with ischaemic heart disease. Though a genetic component has long been suspected in essential hypertension, a clear definite mechanism is yet to be resolved. WHO (8) suggested a search for various biochemical genetic markers associated with high blood pressure. I report here an association of arterial blood pressure levels and haptoglobin phenotypes.

This study has been carried out in a tribal population namely, Manzai Mali inhabiting the Eastern ghats in Visakhapatnam district, Andhra Pradesh. A sample of 83 healthy adults were investigated for Hp phenotypic patterns and arterial blood pressure levels. Blood samples by venepuncture were collected into EDTA and serum was separated. Serum samples were subjected to electrophoresis using starch gels to identify the phenotypes (9). The systolic and diastolic blood pressure levels were measured by using sphygmomanometer with standard sized cuff throughout the investigation.

Table I shows the distribution of systolic and diastolic blood pressure levels in two haptoglobin phenotypes, Hp 2-1 and Hp 2-2. The lower sample size of Hp 2-1 is due to universal preponderance of Hp2 gene. The mean values indicate that both the SBP and DBP levels are higher in phenotype Hp 2-2 than in Hp 2-1. The t-values computed to assess the difference between two patterns are highly significant for both SBP and DBP. These results are corroborated with findings of an earlier study (10), reported a higher systolic blood pressure in males with Hp 2-2 phenotype than those with Hp 1-1.

The probable reasons for this association are discussed based on the earlier studies. Surya Prabha et al (7) attributed the high risk of essential hypertension and associated conditions in Hp 2-2 to low binding capacity of this phenotype with haemoglobin. The haemoglobin liberates in Hp 2-2 individuals as a result of haemorrhages during vascular damage may not getting eliminated completely, resulting in the obstruction of blood flow, and other complications. Saha et al (5) concluded that subjects with Hp 2-2 had

*This work has been carried out at the Department of Anthropology, Andhra University, Visakhapatnam in 1994.
TABLE 1: Distribution of systolic and diastolic blood pressure levels (mm Hg) in two haptoglobin phenotypes.

<table>
<thead>
<tr>
<th>Haptoglobin phenotype</th>
<th>n</th>
<th>SBP X ± SE</th>
<th>DBP X ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hp2-1</td>
<td>12</td>
<td>103.83 ± 2.45</td>
<td>65.17 ± 3.14</td>
</tr>
<tr>
<td>Hp2-2</td>
<td>71</td>
<td>115.98 ± 1.67</td>
<td>74.62 ± 1.09</td>
</tr>
</tbody>
</table>

The occurrence of higher blood pressure levels in Hp 2-2 phenotype may have resulted from chance of higher cholesterol levels. All these studies strongly suggest that Hp gene has a role in lipid metabolism and therefore has effect on cardiovascular system, although the mechanism is not apparent at present.

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REFERENCES