THE DISTRIBUTION OF HAPTOGLOBIN TYPES IN AICHI PREFECTURE

HIDEKI HATTORI, MINORU ASANO

Department of Legal Medicine, Hamamatsu University School of Medicine
(Director: Prof. Minoru Asano)

MASAKAZU OYA, OSAMU SUZUKI, YOSHINAO KATSUMATA AND SHOICHI YADA

Department of Legal Medicine, Nagoya University School of Medicine
(Director: Prof. Shoichi Yada)

ABSTRACT

Polymorphism of haptoglobin (Hp) types was examined among 2,087 unrelated residents of Aichi Prefecture. The phenotypic distribution obtained agreed well with the genetic hypothesis. The frequency of Hp^1 gene in Aichi Prefecture was estimated to be 0.247, which is quite similar to those observed in other districts of Japan.

A genetically determined polymorphism of haptoglobin (Hp) in human sera was first described by Smithies.[1] The three common phenotypes Hp 1-1, Hp 2-1 and Hp 2-2 are controlled by a pair of codominant alleles Hp^1 and Hp^2 at an autosomal locus.[2] Since the discovery of Hp polymorphism, a great number of papers have been written about the incidence of Hp phenotypes and the estimates of Hp gene frequencies in various populations throughout the world.[3] However, no available data concerning the distribution of this polymorphism in Aichi Prefecture have been published yet. This short communication reports the results of our examination on the distribution of Hp types among 2,087 unrelated healthy individuals in this region.

Serum samples were collected from the Blood Center of Nagoya Red Cross. The Hp typing was performed by means of horizontal starch gel electrophoresis according to the method of Poulik,[4] using a discontinuous system of buffers and 10% Starch-Hydrolysed (Connaught, Toronto, Canada). Electrophoresis was conducted at a constant current of 20 mA/15 cm at 4°C for 2 hours. After the separation, the gel was horizontally sliced and stained with 0.2% benzidine in 0.5% acetic acid and 3% hydrogen peroxide.

Table 1. Distribution of Hp types in Aichi Prefecture

Phenotype	Observed		Expected		Chi square
	No.	%	No.	%	
Hp 1–1	132	6.3	127	6.1	0.197
Hp 2–1	766	36.7	776	37.2	0.129
Hp 2–2	1,189	57.0	1,184	56.7	0.024
Total	2,087	100.0	2,087	100.0	0.350

Gene frequencies: $Hp^1 = 0.247$; $Hp^2 = 0.753$ $\chi^2 = 0.350$; d.f. = 1; $0.7 > P > 0.5$

服部秀樹，浅野 稔，大矢正算，鈴木 修，勝又義直，矢田昭一
Received for Publication May 13, 1977

Table 1 shows the distribution of Hp types obtained from the present samples. From the data, the gene frequencies of Hp^1 and Hp^2 are estimated as 0.247 and 0.753, respectively. No example of rare phenotypic variants was detected in our samples. The observed numbers are in good agreement with the numbers expected on the basis of Hardy-Weinberg equilibrium ($\chi^2 = 0.350$; d.f. = 1; $0.7 > P > 0.5$). The value of Hp^1 gene frequency is identical with the mean value in the Japanese population ($Hp^1 = 0.248$).[5)]

REFERENCES

1) Smithies, O., Zone electrophoresis in starch gels: group variations in the serum proteins of normal human adults. *Biochem. J.*, **61**, 629, 1955.
2) Smithies, O. and Walker, N. F., Notation for serum protein groups and the genes controlling their inheritance. *Nature (Lond.)*, **178**, 694, 1956.
3) Giblett, E. R., *Genetic Markers in Human Blood,* Blackwell Scientific Publications, Oxford and Edinburgh, 1969, p.63.
4) Poulik, M. D., Starch gel electrophoresis in a discontinuous system of buffers. *Nature (Lond.)*, **180**, 1477, 1957.
5) Sugita, H. and Tsunenari, S., The distribution of haptoglobin types in Kumamoto district. *Jap. J. Legal Med.*, **28**, 422, 1974 (Japanese with English summary).