ISOELECTRIC FOCUSING IN THE STUDY OF THE Bf SYSTEM : EXISTENCE OF TWO COMMON SUBTYPES OF THE Bf^F ALLELE IN JAPANESE AND ITALIAN POPULATIONS

T.Nagai[+] , G.Rossi[++] ,M.Salviati[++] and O.Prokop[+++]

+ : Department of Legal Medicine,Teikyo University School of Medicine,Tokyo-173,Japan

++: Laboratory of the Center for Blood Transfusion and Human Genetics,Hospital of Vicenza , Vicenza 36100 ,Italy

+++: Department of Forensic Medicine,Humboldt University , 1040 Berlin,GDR

Summary

The Bf gene frequencies including $Bf^{F'}$ and $Bf^{F''}$ alleles in the Japanese and Northern Italian populations were studied using the PAGIF method. The results showed Bf gene frequencies in these populations :

Japanese population:	$Bf^{F'} = 0.0778$	$Bf^{F''} = 0.1007$
	$Bf^{S} = 0.8215$	
Italian population :	$Bf^{F'} = 0.0571$	$Bf^{F''} = 0.1219$
	$Bf^{S} = 0.8210$	

Introduction

Geserick et al.[1] developed the PAGIF method for subtyping of the properdin factor B and reported that Bf^F is not uniform.It can divided into $Bf^{F'}$ and $Bf^{F''}$.

We examined the Bf gene frequencies including $Bf^{F'}$ and $Bf^{F''}$ alleles in Japanese and Italian populations.

Material and Method

Sera of 745 Japanese(living in Tokyo and its suburbs) and 595 Italians (living in Vicenza and its suburbs) were analysed using the PAGIF method as described by Geserick et al.[1] .The Italian sera are separated promptly and transmitted with dry ice by airplane to Japan.

Advances in Forensic Haemogenetics 1
Edited by B. Brinkmann and K. Henningsen

Results

Figure 1 . Schematic representation of Bf allotypes after isoelectric focusing with immunofixation

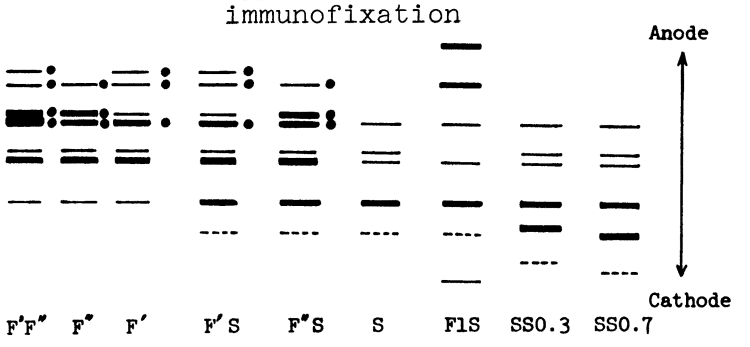

Table 1 . Bf phenotypes of Japanese population

Type	obs. No.	obs. %	exp. No.	exp. %	Gene Frequencies
F'	4	0.5	4.5	0.6	$Bf^{F'}$ 0,0778
F'F''	12	1.6	11.7	1.6	
F''	7	0.9	7.5	1.0	$Bf^{F''}$ 0,1007
F'S	96	12.9	95.2	12.8	Bf^{S} 0.8215
F''S	124	16.7	123.3	16.5	
S	502	67.4	5o2.8	67.5	
Total	745	100.0	745.0	100.0	

Table 2. Bf phenotypes of Italian population

	obs. No.	obs. %	exp. No	exp. %	
F'	1	0.2	1.9	0.3	$Bf^{F'}$ 0.0571
F'F''	10	1.7	8.3	1.4	
F''	9	1.5	8.8	1.5	$Bf^{F''}$ 0.1219
F'S	56	9.4	55.8	9.4	Bf^{S} 0.8210
F''S	117	19.7	119.1	2o.o	
S	4o2	67.5	401.1	67.4	
Total	595	100.0	595.0	100.0	

Table 3. Bf types in Japanese families . F' and F'' are included.

Parental Types	cases	Children F'	F'F''	F'	F'S	F''S	S	cases
F' x S	1	-	-	-	2	-	-	2
F'F''x S	1	-	-	-	2	-	-	2
F'S x F'S	4	2	-	-	6	-	3	11
F'S x S	3	-	-	-	3	-	4	7
F''S x F'S	6	-	3	-	3	3	3	12
F''S x F''S	4	-	-	2	-	4	1	7
F''S x S	8	-	-	-	-	10	11	21
Total	27							62

In this studies clear results were obtained by means of the electrofocusing technique followed by immunofixation with anti-properdin factor B serum (figure 1).The Bf gene frequencies in the populations tested (Table 1 and Table 2) are calculated:

Japanese population : $Bf^{F'} = 0.0778$
$Bf^{F''} = 0.1007$
$Bf^{S} = 0.8215$

Italian population : $Bf^{F'} = 0.0571$
$Bf^{F''} = 0.1219$
$Bf^{S} = 0.8210$

The gene frequencies in both populations observed are therefore quite similar.

The observed and expected values assuming the HARDY-WEINBERG equilibrium were in good agreement.

To elucidate a genetic basis of the new BfF patterns we studied 27 families with 62 offsprings.The result of family investigations are not in contradiction to the assumption of codominant inheritance of the new BfF subtypes $Bf^{F'}$ and $Bf^{F''}$ alleles at a single locus. (Table 3).

Discussion

Our analysis make it possible that instead of the 3 phenotypes BfF,BfS and BfFS , reported by Alper et al.[2] now 6 phenotypes such as BfF' , BfF'F'' ,BfF'' ,BfF'S, BfF''S and BfS can distiguished. This fact leads to the increased validity of Bf subtyping for paternity testing.

References

1. Geserick,G.,Patzelt,D.,Schröder,H. and Nagai,T.: Isoelectrofocusing in the study of the Bf system: Existence of two common subtypes of the Bf^F allele. Vox Sang.44: 178-182 ,1983.
2. Alper,C.A.,Boenisch,T. and Watson,L.: Genetic polymorphism in human glycine-rich beta-glycoprotein. J.Exp.Med.135: 68-8o,1972 .