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Interactions of the Anti-LH Lectin with Erythrocytes of the Patients with High Diastolic Blood Pressure : Further Observations

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KEY WORD *Erythrina lithosperma* Lectin. High Diastolic Blood Pressure. Polymorphism.

ABSTRACT The LH specificity refers to weak (LH-negative) or strong (LH-positiv agglutination of erythrocytes obtained with the lectin from *Erythrina lithosperma*. The LH status of patients with high diastolic blood pressure has been estimated by this anti-LH lectin. Erythrocyte samples from 325 confirmed cases of high diastolic blood type and compared with an appropriate control. The results suggest no association between patient with high diastolic blood pressure and LH reaction patterns.

INTRODUCTION

Lectins interact with erythrocytes by binding to saccharide receptors. These receptors are different from the blood group determinants and are present on all erythrocyte cell surfaces. A new red blood cell membrane specificity in the seed extracts *Erythrina lithosperma*, a plant belonging to the family leguminosae, was reported by Shrivastava et al. (1979) and was called LH by them. The anti-LH lectin reacts with human erythrocytes either by clumping them firmly or just weakly agglutinating them. The former type of reaction is called LH-positive and the latter LH-negative. Further studies relating to the immunochemical properties of the *Erythrina lithosperma* lectin and genetics and population distribution of the LH-specificity have been made by Shrivastava et al. (1979), Sehajpal and Shrivastava (1980, 1981), Reddy et al. (1981, 1985), Kaur (1983), Koley et al. (1991, 1992, 1993, 1994, 1995), Koley and Shrivastava (1992a, b, 1993, 1994), Koley and Dhillon (1996) and Koley (1993, 1994, 1996). Blood pressure is the lateral pressure exerted by blood on the vessel wall while flowing through it. Diastolic pressure is the minimum pressure during diastole. The normal upper limit of diastolic pressure is 90mm of Hg. Diastolic pressure under goes much less fluctuation in health and remains within a limited range. Increase of diastolic pressure indicates that the heart is approaching towards its failure. Consequently, variations of diastolic pressure are of great prognostic importance than those of systolic. Diastolic pressure is the measure of peripheral resistance. It indicates the constant load against which heart has to work. An apparent association between the ABO blood groups and diastolic pressure has been reported by Nance et al. (1964). It is now well established that the LH system is potentialy interesting serological tool for stydying the red and white cell membrane structure along with ABO system. Following our earlier report (Koley et al., 1993) further attempt (considering larger sampel size) was made in the present study to see if there is any association between the LH blood type and high diastolic blood pressure.

MATERIAL AND METHODS

A total of 325 blood samples from confirmed cases with high diastolic blood pressure was obtained from the District Hospital, Sagar (Madhya Pradesh). The diastolic blood pressure 100mm of Hg or above is considered as high. 475 unrelated normal individuals (Koley et al., 1993) acted as controls. Since sex differences are not known to exist in theLH system, the samples collected from both males and females were pooled for all analyses.

For the ABO typing standard serological procedures were followed. The LH-typing was done with anti-LH lectin prepared as described by

Shrivastava et al. (1979). The seeds of *Erythrina lithosperma* was obtained from Botanical Survey of India, Calcutta.

RESULTS AND DISCUSSION

The phenotypic distribution of the LH types and allele frequencies in patients with high diastolic blood pressure are given in table 1. Patients have slightly higher frequency (32.00%) in LH-negative type but lower (68.00%) in LH-positive type than their control counter parts (31.79% in LH-negative and 68.21% in LH-positive type). The differences between these two groups in regard to the distribution of the LH-types is not significant (p>0.05) statistically. In patients, the allele frequency of LH positive type is 0.825 and in control it is 0.826. Both these groups are in Hardy-Weinberg equilibrium.

Table 1: Distribution of the LH types in patients with high diastolic blood pressure and controls

Sample	*N*	*Phenotype frequencies*		*Allele frequencies*	
		LH +	*LH -*	*LH +*	*LH -*
Patients	325	No.Obs 221	104		
		% Obs 68.00	32.00	0.825	0.175
Controls[1]	475	No.Obs 324	151		
		% Obs 68.21	31.79	0.826	0.174

1.Kolety et al. (1993) P>0.05 $\chi^2_{(1)} = 0.003$

Table 2 shows the distribution of ABO blood groups along with their allele frequencies in patients and controls. Patients have lower frequency in group A (25.54%), group O (23.08%) and group AB (8.92%) than the control (26.74% in group A, 26.32% in group O and 9.47% in group AB), and have higher frequency (42.46%) in group B than their control counterparts (37.47%). There exists no significant difference (P>0.05) statistically between these two groups. Patients have higher allele frequency of *B* (0.307) of than controls (0.273), but have lower allele frequencies for allele *A* (0.193) and *O* (0.500) than controls (*A*=0.203; *O*=0.524). Both these population are in Hardy-Weinberg equilibrium.

The ABO groupwise distribution of the LH types in patients and controls is shown in table 3. Patients have higher frequency (57.83%) in A/LH-negative type than controls (48.82%), but have lower incidences of B/LH-negative type (31.16%) and AB/LH-negative type (48.17%) than controls (34.83% in B/LH-negative type and 60.00% in AB/LH/negative type, respectively). Statistically no significant differences (P>0.05) were found in any case. It follows the results of our earlier study (Koley et al., 1993). High frequency of LH positive type in both patients and controls caused the non significant difference among them. Thus we may conclude that there is a lack of any association

Table 2: Distribution of the ABO blood groups in patients with high diastolic blood pressure in controls

Sample	*N*		*Phenotype frequencies*				*Allele frequencies*		
			A	*B*	*O*	*AB*	*A*	*B*	*O*
Patients	325	No. Obs	83	138	75	29			
		% Obs	25.54	42.46	23.00	8.92	0.193	0.307	0.500
Controls[1]	475	No.Obs	127	178	125	45			
		%Obs	26.74	37.47	26.25	9.47	0.203	0.273	0.524

1.Koley et al. (1993)

Table 3: ABO groupwise distribution of the LH types in patients with high diastolic blood pressure and controls

Sample	*N*		*A*		*B*		*O*		*AB*	
			LH+	*LH-*	*LH+*	*LH-*	*LH+*	*LH-*	*LH+*	*LH-*
Patients	325	No. Obs	35	48	95	43	75	-	16	13
		% Obs	42.17	57.83	68.84	31.16	100.00	-	55.17	48.17
Controls[1]	475	No. Obs	65	62	116	62	125	-	18	27
		% Obs	51.18	48.82	65.17	34.83	100.00	-	40.50	60.00
			χ^2 (1) = 1.632 P>0.05		χ^2 (1) = 0.470 P>0.05		χ^2 1) = 1.639 P>0.05			

1. Koley et al. (1993)

between high diastolic blood pressure and LH reaction patterns.

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