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ABO AND RH BLOOD GROUPS IN CARDIOVASCULAR DISEASES, FROM IRAN.

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ABSTRACT

ABO and Rh blood groups were studied in a total of 1680 patients with cardiovascular diseases (congenital n=547, valvular n=887 and coronary n=246). Statistical analysis (X^2 and Woolf' s Test) showed significant excess of B/O in mitral valve, aortic valve total valvular diseases and heart diseases generally, also an increase of A/O in myocardial infarction.

Significant increase of the frequency of Rh(D) positive individuals, was shown in myocardial infarction and total heart diseases.

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INTRODUTION

The first study on association between ABO blood groups and disease was done on patients affected with cancer of stomach(1).

Extensive reviews of numerous investigations on blood groups and diseases in 1978(6). Data about such studies from Iran so far is not available, except only one (4). The purpose of this investigation was to study association between ABO and Rh blood groups, sex, age and cardiovascular diseases and to compare the results with those of other investigations.

MATERIALS AND METHODS

The study was performed on the patients hospitalized in the Heart Hospital in Tehran. Exact final diagnoses were confirmed by clinical cardiological examinations, laboratory, EKG,X-rays, angiographies and other special necessary diagnostic findings, in the same hospital.The study was done in a period of 14 months during 1980-1981.

The total number of patients n=1680 (M=919, F-761) were categorized in three groups;congenital (M=296, F=251) valvular (M-429, F=458) and coronary (M=194, F=52) heart diseases, as given in Table 1 and 2. It was notable that the number of myocardial infarction in comparison to other heart diseases in this sampling was limited, because MI is treatable in every small private hospital, but the other two groups, congenital and valvular which need special diagnostic and therapeutic facilities (Operation) refer to highly specialized centers, such as Heart Hospital in most cases.

The blood group of each patient was typed for ABO and Rh in the Laboratory of the Heart Hospital. The control group was taken from the donors of the Blood Transfusion Service of the same hospital. After analysing the datd, statistical analyses were performed by X, SD, (Togle 1) X^2 and Woolfs Methods.

RESULTS AND DISCUSSION

Table 1 shows the distribution of means and standard deviations of age in different heart diseases.The total congenital heart diseases showed an early onset of age(x-11. 5, SD=9.3), the totalvalvular diseases showed onset in young ages (X=28. 5, SD=11.5)and the coronary (MI) showed a late onset (X=57.7,SD=12.4).

The age group distribution in three groups of heart diseases is not given in table, but in diagramatic form (Fig.1).

The mean age of MI for male and femaie were X=56.91, X=60.47, respectively. However it is of interest that the mean age calculation for MI in a hospital sampling can never be precise, because most of the young cases have instan death.

Table 2 shows the sex distribution for heart diseases in this sampling. Statistical analysis of the results, given in the same table, show significant differences with excess of males specially for VSD, PS , AV and MI and inversely for PDA and MV with excess of females. The total of 919 males to 761 femles show a slight increase of males in the heart diseases.

Table 3 shows the phenotype distribution of ABO in different heart diseases in comparison to the control group. The statistical analysis using X^2 and Woolf's Test confirmed the significance of ABO distribution in some of the heart diseases, as given in the same table.

Significant association between anemia (as a base for congestive heart failure) and ABO blood groups has been reported (4). Study on 122 newborns with congenital heart diseases from Michigan, could not show significant association with ABO blood groups, (5) but, in the present study, as shown in Table 3 slight significant association is notable. The results of several investigations(6) confirmed an excess of B/O for the patients with rheumatic heart diseases,as the origin of valvular defects, but no significant differences for Rh groups, which are in accordance with the results of present study (table 3 and4). Other investigators have shown that persons with blood group A, have a higher risk for developing excess serum lipids and venous thrombosis (factors contributing to

cardiovascular diseases) than persons with O blood group (2,7)which is in agreement with the result of present study, increase of A/O was shown in a study of ischemic heart diseases significant in Australian patients (3) which is in accordance with the results of the present investigation.

Table 4 shows the Rh (D+and D-)distribution in cardiovascular diseases in comparison with the control. Statistical analysis show significant results in MI and total heart diseases. On the whole the Rh positive persons have a higher risk for some of the cardiovascular diseses specially MI. The collection of 16 investigations on a total of 2412 patients (6) showed also a significant raised D/D-.

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Table 1- Age (Year) Distribution in Heart Diseases

Origin	Diseases		N	$(\bar{X})$	(SD)
Congenital	Patent Ductus Arteriousus	PDA	110	8.5	5.8
	Atrial Septal Defect	ASD	129	16.2	12.1
	Ventricular Septal Defect	VSD	109	11.3	10.1
	Tetralogy of Fallot	TF	92	10.2	7.4
	Pulmonary Stenosis	PS	95	14.0	9.5
	Coarctation of Aorta	CA	12	9.3	7.9
	Total		547	11.5	9.3
	Mitral Valve	MV	650	28.5	11.4
	Aortic Valve	AV	172	28.2	12.0
	Tricuspid Valve	TV	65	29.5	10.5
	Total		887	28.5	11.5
Coronary	Myocardial Infarction	MI	246	57.7	12.4

Table 2- Sex Distribution in Heart Diseases

Diseases	N	Male		Female		d.f.=1 X^2	P
		n	%	n	%		
P D A	110	34	30.91	76	69.09	8.32	0.005>P>0.001
A S D	129	64	49.61	65	50.39	0.00	
V S D	109	71	65.14	38	34.86	5.11	0.002>P>0.01
T F	92	54	58.70	38	41.30	1.40	
P S	95	63	66.32	32	33.68	5.20	0.02>P>0.01
C A	12	10	83.33	2	16.67	3.00	
Total Congenital	547	296	54.11	251	45.89	1.85	
M V	650	284	43.69	366	56.31	5.19	0.02>P>0.01
A V	172	119	69.19	53	30.81	13.15	P<0.001
T V	65	26	40.00	39	60.00	1.31	
Total Valvuler	887	429	48.37	458	51.63	0.47	
M I	246	194	78.86	52	21.14	44.71	P<0.001
Total Heart.Dis.	1680	919	54.70	761	45.30	7.45	0.010>P>0.005

Table 3- ABO Distribution in Heart Diseases

Diseases	n	A		B		AB		0		X^2	d.f.=3 p	Woolf	d.f.=1 p
		n	%	n	%	n	%	n	%				
PDA	110	41	37.27	23	20.91	5	4.55	41	37.27	4.09			
ASD	129	38	29.46	36	27.91	8	6.20	47	36.43	3.56			
VSD	109	34	31.19	30	27.52	3	2.75	42	38.53	6.12			
TF	92	31	33.70	19	20.65	8	8.70	34	36.96	0.62			
PS	95	27	28.42	25	26.32	7	7.37	36	37.89	1.32			
CA	12	2	16.66	4	33.33	1	8.33	5	41.67	1.50			
Total Conh	547	174	31.81	137	25.04	31	5.67	205	37.48	8.72	0.05>p>0.02		
MV	650	193	29.69	175	26.92	56	8.62	226	34.76	10.84	0.20>p>0.01	B/0=10.86	p<0.001
AV	172	51	29.65	56	32.56	11	6.40	54	31.40	12.990	0.005>p>0.001	B/0=11.46	p<0.001
TV	65	23	35.38	16	24.62	9	13.85	17	26/15	5.98	AB/0=4.98	0.05>p>0.02	
Total Valv.	887	267	30.10	247	27.85	76	8.57	297	33.49	19.84	p<0.001	B/0=19.62	p<0.01
MI	246	92	37.40	52	21.41	16	6.50	86	34.96	6.65	A/0=5.09	0.02>p>0.01	
Total H. D.	1680	533	31.72	436	25.95	123	7.32	588	35.00	19.81	p<0.001	B/0=16.64	p<0.001
Control	3326	999	30.04	715	21.50	285	8.56	1327	39.90				

Table 4: Rh Distribution in Heart Diseases

Diseases	N	D^+		D		d.f.=1 X^2	P
		n	%	n	%		
P D A	110	99	90.00	11	10.00	0.16	
A S D	129	120	93.02	9	6.98	2.27	
V S D	109	96	88.07	13	11.93	0.05	
T F	92	85	92.39	7	7.61	1.18	
P S	95	88	92.63	7	7.37	1.38	
C A	12	11	91.67	1	8.33	0.10	
Total Cong.	547	499	91.22	48	8.78	2.89	
M V	650	585	90.00	65	10.00	0.82	
A V	172	158	91.86	14	8.14	1.57	
T V	65	59	90.77	6	9.23	0.25	
Total Valv.	887	802	90.42	85	9.58	1.92	
M I	246	236	95.93	10	4.07	12.23	P<0.001
Total H.Dis.	1680	1537	91.49	143	8.51	8.82	0.005>p>0.001
Control	3326	2953	88.79	373	11.21		

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