

Clinical Profile Of Atrial Septal Defect In A Cardiac Hospital

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Summary:

The charts of 115 patients with the diagnosis of atrial septal defect who were seen in the Echocardiographic Department at the National Institute of Cardiovascular Diseases, Karachi, during January to December 1993, were reviewed for clinical profile. Only 40% of patients were 18 years of age or less while 60% were older than 18 years. Most adults with ASD were symptomatic while most children were asymptomatic. Pulmonary arterial hypertension was noted in 6.5% children and 16.7% of adults. On follow up 49% of patients were lost to follow up. It was concluded that ASD was detected much too late and that great number of adults are expected to be symptomatic with ASD. Significant number are expected to develop pulmonary vascular disease. It is suggested that physical examinations be made frequently during childhood for early detection of ASD.

In a developing country such as Pakistan, congenital cardiac lesions often remain undetected even during adulthood. In women it is not uncommon to discover cardiac lesions for the first time during pregnancy. Atrial Septal Defect, except during infancy, and old age is generally asymptomatic and remains undetected so that it may present to the physician or hospital emergency room only when complications have supervened¹⁻³. In order to study the clinical profile of secundum type atrial septal defect, we analysed all patients with atrial septal defect who were seen at the National Institute of Cardiovascular Diseases during January to December of 1993.

Material and Methods:

The charts of 115 patients who were seen at the NICVD during January to December 1993, were reviewed in February 1995. The diagnosis of atrial septal defect was proven by 2-dimensional colour flow Doppler echocardiography⁴. The size of the atrial septal defect was described as small, moderate and large. Any defect larger than 2.5 cm in diameter was

considered to be large and small defects were less than 1.0 cm in diameter. Right ventricular outflow tract was echocardiographically interrogated in all patients and pressure gradient across the right ventricular outflow and pulmonary valve was recorded. The pulmonary arterial pressure was evaluated from the pressure gradient at the tricuspid valve. The symptoms were evaluated from the recorded history by the medical residents at the time of presentation. In 24 per cent of these patients cardiac catheterization and angiography was performed. The follow up of these patients was the last recorded event in the charts till February 1995. Surgical closure was achieved in 23 per cent of these patients.

TABLE I
TYPES OF ASD IN 115 PATIENTS

TYPE	NO.	%
ASD II ^o	99	86.1
Sinus Venosus Type	9	7.8
ASD I ^o	6	5.2
Coronary Sinus Type	1	0.9
	<u>115</u>	

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Results:

Fortysix of 115 patients (40 per cent) were 18 years of age or less; mean age being 11.6 ± 5.2 years and sixty-nine (60 per cent) were greater than 19 years of age, mean age was 34.6 ± 12.1 years. Females constituted 51.3% of the patients and males 48.7%.

TABLE II

ASSOCIATED LESIONS WITH ASD SECUNDUM

	NO.	%
ASD II° with PVS	8	6.9
ASD II° with MR (Mod. to Severe)	7	6.1
MVP	4	3.5
Mitral Stenosis	4	3.5
Ebstein's Anomaly	2	1.7

Ninety-nine patients (86.1%) had secundum atrial septal defect of fossa ovalis type, 9 patients (7.8 per cent) had sinus venosus type, six patients (5 per cent) had atrial septal defect at primum septum. Only one patient had coronary sinus atrial septal defect Table I. Associated lesions were present in 25 of 115 (21.7%). The most common associated lesion was pulmonary valve stenosis occurring in 8 patients (7 per cent). Seven (6.9%) had associated moderate to severe mitral valve regurgitation. Rheumatic mitral valve stenosis was present in four patients (3.5) per cent and 4 patients (3.5 per cent) had prolapse mitral valve. Ebstein's anomaly was noted in 2 patients (1.7%) Table II. The size of the left ventricle was found to be small in children as well as adults. The anteroposterior dimension of left ventricle on M-mode echocardiograms was 3.4 ± 0.44 cm in 34 of 46 children and 3.6 ± 0.54 cm in 55 of 69 adult patients in whom this measurement was available⁵. Symptoms at presentation were analysed in 46 children, who were 18 years age or less. Twelve of 46 (26%) children were asymptomatic and detection of cardiac murmur led to the diagnosis. Recurrent chest infections were noted in 10 (22%) palpitation in 12 (26%), chest pain in 5 (10.7%) and abdominal pain and dyspnea was noted in 2 each (4.3%), cyanosis was present in one patient who had coronary sinus type

ASD Table III. In adults greater than 19 years of age, chest pain was the most common symptoms occurring in 41 patients (35.7%). Palpitation was present in 35 (30.4%) and shortness of breath, dyspnea was noted in 31 (27.0%). Only six patients 5.2 per cent were completely asymptomatic. Recurrent chest infections were noted in 5 adult patients (4.3%). Congestive heart failure was present in 2.6 per cent patients and cyanosis was noted in only one Table IV.

The pressure gradient at the tricuspid valve was determined by Colour Flow Doppler echocardiography. In 27 of 46 children (58.7%) were 18 years age or less had pressure gradient recorded at the tricuspid valve. Twentyone of 27 children had pressure gradient at the tricuspid valve of less than 35 mmHg, mean 29.9 ± 5.6 mmHg. Five patients had pressure gradient greater than 36 mmHg and 1 patient had greater than 60 mmHg. Two of these 5 patients had significant pulmonary stenosis Table V and remaining one patient had a gradient of 90 mmHg. Thus 3 of 46 patients (6.5 per cent) were expected to had pulmonary arterial hypertension⁶. In sixty-six adult patients, 11 (16.7%) had pulmonary arterial hypertension⁷. The mean age of these patients was 51.3 ± 13.3 years. Seven of these 11 patients had

TABLE III

PRESENTATION OF ASD IN 46 CHILDREN, JAN—DEC 1993

	NO.	%
Asymptomatic	12	26.1
Chest Infection	10	21.7
Palpitation	12	26.0
AB. Pain	2	4.3
Chest Pain	5	10.7
Dyspnea	2	4.3
Cyanosis	1	2.1

pressure gradient at the tricuspid valve of 58.1 ± 17.7 mmHg on Doppler echocardiography Table VI. Four of the 11 patients had systolic pulmonary arterial pressure on cardiac catheterization of 57.0 ± 11.0 mmHg with a mean pulmonary arterial pressure of 38.8 ± 10 mmHg. Thus 11 of 69 patients (15.9 per

TABLE IV

PRESENTATION OF ADULT ASD PATIENTS
IN PAKISTAN, JAN—DEC 1993

PRESENTATION	NO.	%
Chest Pain	41	35.7
Palpitation	35	30.4
SOB + Dyspnea	31	27.0
Completely Asymptomatic	6	5.2
Recurrent Chest Infection	5	4.3
C H F	3	2.6
Cyanosis	1	0.8
Others (Hemoptysis, Dizz.)	2	1.7

cent) had pulmonary arterial hypertension⁸⁻⁹⁻¹⁰. The follow up of these patients showed that 26 of 115 (22.6%) had surgical close of atrial septal defect, 33 of 115 patients (28.7%) were being followed medically and 56 of 115 patients (48.7%) were lost to follow up.

Discussion:

Usually Atrial Septal Defect does not produce symptoms during childhood. Occasionally it can cause congestive heart failure during infancy³. Our data

TABLE V

TRICUSPID GRADIENT IN 27 ASD PATIENTS
≤ 18 YEARS AGE

GRADIENT mm Hg.	MEAN +- SD	NO.	%
<35	29.9 +- 5.6	21	78
36-50	47.0 +- 7.6	5*	19.2
>50	90	1	3.8

34%: 6.5% PAH

* 2 Patients had Significant PS.

shows that most children at presentation were relatively older and asymptomatic. Recurrent chest infections did occur in significant members and this is expected. Since general physical examinations are not routinely conducted during childhood or even during adult life, significant number of adults were seen with ASD who showed symptoms which could be attributed to the cardiovascular system such as congestive cardiac failure were noted in three per cent of the adults. This clinical profile showing significant number of adults with symptoms is consistent with the old experience prior to the time when surgical repair of their defects was not possible¹⁻²⁻⁸. The most common type of ASD was at the fossa ovalis, sinus venosus, coronary sinus type did also occur as expected. Since ASD in our study remained unrepaired in our older patients they become symptomatic and significant numbers developed pulmo-

TABLE VI

PULMONARY ARTERIAL HYPERTENSION
IN PATIENTS ≥ 19 YEARS AGE

PAH	11/69 (15.9%)
AGE (YEARS)	51.3 +- 13.3
E-TR mm Hg	58.1 +- 17.2 N = 7
C-PAPmm Hg S;	57.0 +- 11.0 N = 4
m;	35.5 +- 10.0 N = 4

nary arterial hypertension due to obstructive pulmonary vascular disease.

Thus clinical profile of ASD was that of late detection of the defect in childhood and insignificant number during the middle age. The adults were more symptomatic. The second significant factor of the study was that nearly one half of the patients who were seen with atrial septal defect were lost to follow up. This loss has grave consequences for the patient and was more in groups of patients who were asymptomatic or whose symptoms were controlled with medications.

It is concluded that the clinical profile of our

patients resemble the one described in literature prior to the time of corrective surgery of these defects⁸⁻¹⁰. It is suggested that regular physical examination of children and adults need to be conducted in order to detect ASD in our population. Undetected an ASD, which is a simple lesion produces symptoms and would continue to impose additional health burden on already stretched medical services, by causing symptoms of congestive heart failure, arrhythmias and may become inoperable due to development of obstructive pulmonary vascular disease,¹⁰ (i.e. Eisenmenger syndrome).

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Diabetic patients controlled with either insulin or oral medication were included, but not those controlling their diabetes with diet alone. Unstable angina was defined as patients with rest pain or pain on walking less than twenty metres or those proceeding to surgery on an urgent basis following a failed angioplasty. Poor myocardial function was defined as a pre-operative ejection fraction less than or equal to 45%. Renal failure was defined as a pre-operative serum creatinine greater than 150 ($\mu\text{mol/L}$). Obesity was defined as a pre-operative weight in excess of 100 kg. All the patients with carotid artery disease had pre-operative angiographic evidence to demonstrate significant disease. Dysrhythmic patients were on oral medication for this specific problem. The remaining criteria were established from the patients clinical history.

Discussion:

The decision to keep any particular patient ventilated post-operatively was always made between the discontinuation of bypass and the end of surgery—up to that point all the patients had been managed in a manner that would permit extubation immediately after the completion of surgery.

TABLE 2

	Group E	Group V
Diabetic	22	8
Unstable Angina	10	4
Poor Myocardial Function	12	15
Renal Failure	5	5
Carotid Artery Disease	1	2
Obesity	4	1
Asthma/Emphysema	4	0
Dysrhythmias	4	5
Alcohol Abuse	2	1
Re-do Surgery	9	3

There were four patients, who were initially extubated but subsequently required re-intubation and ventilation. For the purposes of analysing the data presented in this study, these four patients have been included in Group V. The details of these patients are as follows:

1. A sixtyfour-year old diabetic man with poor pre-operative ventricular function ($\text{EF}=45\%$) underwent quadruple coronary artery bypass grafting and was transferred to the intensive care unit awake, without inotropes and cardiovascularly stable. Thirty minutes later he suddenly developed complete heart block associated with profound hypotension. He was rapidly re-intubated and treated with nitroglycerine and isoprenaline infusions. He was extubated twelve hours later and made an uneventful recovery.
2. A seventyfour-year old diabetic man underwent triple coronary artery bypass grafting. He had a pre-operative ejection fraction of 50% and bilateral carotid artery occlusions. He was re-intubated ninety minutes post-operatively because of excessive drowsiness and carbon dioxide retention unaffected by doxapram or small doses of naxolone. He was successfully extubated ten hours later having received only nitroglycerine and 'renal' dopamine infusion and made a good recovery.
3. An obese sixtyfive-year old woman with a pre-operative ejection fraction of 45% underwent re-do triple coronary artery bypass grafting. She was extubated and transferred to the ICU on nitroglycerine and 'renal' dopamine infusions. During the second post-operative hour she developed complete heart block which caused a dramatic fall in cardiac output. Pacing failed to restore an adequate cardiac output and she was re-intubated and subsequently maintained on isoprenaline and adrenaline infusions. She was weaned from ventilatory and inotropic support thirty-six hours later and made a good recovery.
4. A sixtyone-year old man with good pre-operative ventricular function underwent quadruple coronary artery bypass grafts and was transferred to the intensive care unit post-operatively on a nitroglycerine infusion only. Excessive blood loss during the first two post-operative hours necessitated a return to the operating theatre. He was extubated four hours after the re-opening and recovered uneventfully without the use of inotropes.

There are five principal reasons for leaving patients ventilated at the end of cardiac surgery:

1. Low cardiac output requiring significant inotropic support or intra-aortic balloon.