

Echocardiography Findings Among Patients Referred For Such Test In Missan Governorate.

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الخلاصة

في هذه الدراسة 2215 مريض تم فحص القلب لهم بجهاز الأمواج فوق الصوتية (الايكو) في مستشفى الصدر العام في العماره للفترة من تموز 2003-تموز 2005. تبين إن 847 مريض فقط (32.2%) نتائجهم غير طبيعیه. كما تبين عدم مطابقة نتائج الفحص مع التشخيص في الإحالة لعدد مؤثر من المرضى. جرت فهرسة النتائج حسب الجنس ونوع المرض وتمت مقارنتها بنتائج الدراسات الأخرى.

Abstract

In this study ,out of 2215 patients referred for echocardiography unit in Al-sadder general hospital in Al-Ammara from jul.2003-jul.2005. 847 (38.2%) patients were found to have abnormal echocardiograms with more males were been examined than females. Echocardiography findings, were not matching the clinical impression that warranted such test in considerable number of patients. In this study, results regarding the incidence or sex distribution of some cardiac abnormalities were comparable to that recognized in some other studies, while different results were recognized, regarding some other cardiac lesions.

Introduction

Echocardiography is a noninvasive technique that evaluates cardiac anatomy and function with image recordings produced by sound energy¹. Sound frequencies in the range 1-10 million cycle per second are transmitted from piezoelectric crystal along a carefully defined path within the thorax². Ultrasound is reflected at interfaces between blood and more solid tissues, so anatomic dimensions can be measured³. Routine echocardiography examination can be performed from several acoustic windows; suprasternal, parasternal, apical, subcostal, and recently transesophageal echocardiography⁴. Numerous advances have occurred in echocardiography, these advances include Doppler flow images, or color Doppler, transesophageal echocardiography, new spectral Doppler applications, stress echocardiography, contrast echocardiography, intravascular ultrasound and new computer techniques or capture, display, analysis and 3-D reconstruction of ultrasonic images⁵.

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Echocardiography, because of its portability, repeatability, and ability to evaluate myocardial and valvular function, is a valuable tool in assessment of intensive care unit (ICU) patients⁶. Echocardiography is of considerable value in diagnosing pericardial effusion, valvular disease, (especially mitral stenosis), abnormal motion of the anterior mitral leaflet in hypertrophic cardiomyopathy, mitral valve prolapse and left atrial tumor⁷. It also allows examination of the ejection fraction, the relative sizes of the septum and the atrial and ventricular muscle walls and the dimensions and volumes of the atria and ventricles⁷.

Aims of study

To shed light on the incidence and nature of echocardiography cardiac abnormalities among patients referred by their doctors for such test. Also to present a baseline data regarding echocardiography results among patients, so that, future, probably more informative studies may make use of these data.

Patients and Methods

In this study, the results of echocardiography of patients referred for this test were analyzed. Patients included in this study were those from the inpatient department (mainly the medical and pediatric wards) and patients referred from the outpatient department in the Al-Sadder General hospital in Al- Ammara in addition to patients referred from other hospitals and health centers in the province of Missan, from July 2003 to July 2005. Patients of all age groups were included in this study. M-mode, 2-D, Doppler flow image, and color Doppler were used in examining the patients referred to the echocardiography unit. Parameters taken into consideration in this study were the total number of patients, sex, the result of echocardiography study (normal or abnormal) and the nature of the cardiac abnormality recognized. Abnormal results are classified into acquired and congenital. Acquired lesions are sub classified into non-valvular and valvular types. Non-valvular abnormalities considered in this study, were findings consistent with; ischemic heart disease, left ventricle hypertrophy (LVH), and pericardial disease. In combined valve disease, the lesion is defined as stenosis or regurgitation according to the predominant abnormality.

Results

Out of 2215 patients examined by echocardiography, 1368(61.8%) patients were found to have no significant echocardiographic abnormality, while the remaining 847(38.2%) patients were found to have abnormal echocardiograms. Table-1. No significant difference between sexes could be observed.

Table-1: Echocardiograms results of patients and sex distribution.

| Finding | Male % | Female % | Total % |
|----------|-----------|-----------|------------|
| Normal | 807 60.7% | 561 63.5% | 1368 61.8% |
| Abnormal | 523 39.3% | 324 36.5% | 847 38.2% |
| Total | 1330 100 | 885 100 | 2215 100 |

Among those 847 patients with abnormal echocardiographic findings, acquired non-valvular abnormalities were the most frequent, followed by acquired valvular and then the congenital cardiac abnormalities. Table-2.

Table-2: Types of abnormalities recognized by echocardiography.

| Abnormality | No. of patients | percent |
|---------------------------------|-----------------|---------|
| Acquired non-valvular | 424 | 50.1% |
| Acquired valvular abnormality. | 280 | 33.1% |
| Congenital cardiac abnormality. | 143 | 16.8% |
| Total | 847 | 100 |

Out of the 424 patients with acquired non-valvular heart disease, ischemic changes (diastolic dysfunction of the left ventricle, hypokinesia or akinesia of myocardium, aneurysmal dilatation, heart failure) were the most frequent finding. Table-3.

Table-3: Acquired non-valvular echocardiographic abnormalities & sex distribution.

| Finding | female | % | male | % | Total | % |
|---------|--------|-------|------|-------|-------|------|
| IHD | 141 | 80.1% | 184 | 74.2% | 325 | |
| | | | | 76.6% | | |
| LVH | 30 | 17.1% | 55 | 22.2% | 85 | |
| | | | | 20.1% | | |
| PE | 5 | 2.8% | 9 | 3.6% | 14 | 3.3% |
| Total | 176 | 100 | 248 | 100 | 424 | 100 |

(IHD=ischemic heart disease, LVH=left ventricle hypertrophy, PE=pericardial effusion).

Among patients with acquired valvular abnormalities, MVP was the most frequent abnormality recognized forming 46.2% of the valvular abnormalities detected by echocardiography. Table-4.

Table-4: Valvular abnormalities among patients and sex distribution.

| Abnormality | female | % | male | % | Total. | % |
|-------------|--------|-------|------|-------|--------|-------|
| MVP | 47 | 42.9% | 70 | 48.1% | 117 | 42.2% |
| MS | 44 | 39.3% | 53 | 28.6% | 97 | 35.0% |
| AS | 5 | 4.5% | 20 | 10.6% | 25 | 8.9% |
| AR | 6 | 5.3% | 16 | 8.5% | 22 | 7.1% |
| MR | 9 | 8.0% | 10 | 5.3% | 19 | 6.8% |
| Total | 111 | 100 | 169 | 100 | 280 | 100 |

(MVP=mitral valve prolapse, MS=mitral stenosis, AS=aortic stenosis, AR=aortic regurgitation, MR=mitral regurgitation.)

Out of the 847 patients with abnormal echocardiograms, 143 (16.8%) patients were found to have congenital heart lesions of different varieties. Table-5.

Table-5: congenital cardiac abnormalities and sex distribution.

| Congenital lesion | female | % | male | % | Total. | % |
|-------------------|--------|-------|------|-------|--------|-------|
| VSD | 20 | 43.5% | 47 | 48.5% | 67 | 46.8% |
| ASD | 21 | 45.7% | 40 | 41.2% | 61 | 42.7% |
| TOF | 2 | 4.3% | 3 | 3.1% | 5 | 3.5% |
| HOCM | 1 | 2.2% | 3 | 3.1% | 4 | 2.8% |
| PS | 0 | 0 | 3 | 3.1% | 3 | 2.1% |
| PDA | 2 | 4.3% | 1 | 1.0% | 3 | 2.1% |
| Total | 46 | 100 | 97 | 100 | 143 | 100 |

(VSD=ventricular septal defect, ASD=atrialseptal defect, TOF=tetralogy of Fallot, HOCM=hypertrophic obstructive cardiomyopathy, PS=pulmonary stenosis, PDA=patent ductus arteriosus).

Table-6: summarizes the number and incidence of different cardiac findings by echocardiography study among the total number of patients examined.

| Finding | number of Pt. | percent |
|---------|---------------|---------|
| Normal | 1368 | 61.8% |
| IHD | 325 | 14.7% |
| MVP | 117 | 5.3% |
| MS | 97 | 4.4% |
| LVH | 85 | 3.8% |
| VSD | 67 | 3.0% |
| ASD | 61 | 2.8% |
| AS | 25 | 1.1% |
| AR | 22 | 1.0% |
| MR | 19 | 0.9% |
| PE | 14 | 0.6% |
| HOCM | 4 | 0.2% |
| TOF | 5 | 0.2% |
| PS | 3 | 0.1% |
| PDA | 3 | 0.1% |
| Total | 2215 | 100 |

Discussion

This study was done to shed light on the nature of echocardiography findings among patients referred by their doctors for such test so that to correlate the findings with the clinical impression and to present a baseline data regarding the echocardiography findings among patients with provisional diagnosis of heart disease in Missan province. Future, probably, more informative studies may make use of these results. Echocardiography unit in Al-Sadder hospital in Al-Amara is the only unit for echocardiography the province, so the stastical data obtained through this study may reflect the nature of echocardiography findings among patients in this province. Out of the total number of patients examined by echocardiography, 1368(61.8%) patients were found to have normal echocardiograms, while the remaining 847 (38.2%) patients were found to have abnormal findings of different varieties with slightly more ,but not significant, abnormalities among males than females (table-1).Such high percentage of negative echocardiograms among patients referred for this test in our study, may reflect improper indication or selection of patients for such test. Lack of the clinical notes in some of the referral request paper may contribute to false negative results. It is said that the clinical value of echocardiography is always enhanced by defining the cardiovascular history and physical findings and specifying the cardiac structures of interest to be echocardiographed⁹. Also such high incidence of normal echocardiograms may be due to missed abnormalities by the operators. It is said that, echocardiography result is operator dependant. In a study, echocardiography is technically difficult in about 10% of patients ⁶.In other study, adequate studies are obtained in 75-80% of cases⁸. Among the 847 patients with abnormal echocardiograms, acquired non-valvular abnormalities were the most frequent, followed by valvular diseases and then by congenital heart anomalies (table-2).The pattern of cardiovascular disease varies strikingly between different countries¹⁰.

In our study, echocardiography findings consistent with the diagnosis of ischemic heart disease ,were the most frequent non-valvular abnormalities.table-3.

Out of the 280 patients with valvular lesions in our study, MVP was the most common abnormality detected by echocardiography,(table-4),Mitral valve prolapse is increasing in frequency in the recent years as a result of enhanced diagnostic accuracy available through echocardiography¹³. such finding, in our study, is not comparable to

some extent to other studies regarding sex distribution of MVP and it may be due to the fact that more males were been examined, probably due to embarrassment that this test forms for some women, particularly with trivial complaints, or it may reflect different sex incidence of MVP in this province. In a study, MVP is said to occur in 5-10% of the population more commonly in females¹²The other valve lesion was mitral valve stenosis; it constitutes 32.6% of valvular lesions recognized with more incidence among women, Table-4. In a study, 25% of all patients with rheumatic heart disease have pure mitral valve stenosis, with two-thirds of all patients are females¹⁴.In other study, in 40% of cases this is the only valve lesion¹⁶.The predominant cause of MS is rheumatic fever¹⁴, however, history of rheumatic fever is only obtained in 50% of patients with mitral stenosis in some studies¹⁵. The echocardiography is helpful in determining whether the patients with mitral stenosis is suitable candidate for balloon mitral valvoplasty¹⁴. The other valve affected, was the aortic valve, 25 cases (8,9%) of aortic stenosis (AS) and 20 (7.1%) cases of aortic regurgitation (AR),table-4. In a study, AS occurs in about one-fourth of all patients with chronic valvular heart disease¹⁷.It is obvious through our study that aortic valve disease is more frequent among men than women table-4. This finding is to some extent comparable to some other studies regarding sex distribution of aortic valve disease. In a study, 3/4 of patients with isolated aortic stenosis in adult life are males¹³⁻¹¹⁹⁰ and 70% of patients with predominant aortic regurgitation are males¹³⁻¹¹⁹⁴. Aortic regurgitation was detected in 20 patients (7.1%) with valvular lesions in our study-table-4. Aortic regurgitation is usually the result of rheumatic fever^{13-page1194}. In our study, mitral regurgitation was detected in 19 (6.8%) patients with valvular lesions, with slightly more frequent incidence among women than men, table-4. In a study, the most common cause of mitral regurgitation is rheumatic fever, and it occurs more commonly in males¹⁹.

Congenital cardiac diseases (CHD) were recognized in 143 (6.4%) patients out of the total number of patients examined-.According to studies in the Western world, the incidence of CHD is being 7/1000 live births²¹.We don't have statistics regarding the incidence of CHD among live births because checking of newborns for presence of such disease is not routine practice in our hospitals. The echocardiographic diagnosis of congenital cardiac disease is challenging because of the limitless variation of cardiac anatomy and the need to define all extra cardiac structures such as great arteries

and veins as well as intracardiac structures²¹. In our study, about two thirds of patients with congenital cardiac diseases were males (97 males and 46 females)-table-5. In other study, the overall incidence of congenital heart disease in males and females are equal²¹. Congenital heart disease usually manifests in childhood but may pass unrecognized and not present until adult life¹⁸.

Conclusion

1- Good history, proper physical examination and specifying the cardiac structure to be echographed, may enhance the clinical value of echocardiography and decrease the number of negative echocardiograms.

2-Valvular heart diseases, although getting less than ischemic heart disease, are still common in Missan province, a problem that may reflect a fact that rheumatic fever is still common health problem in this province.

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