

Screening Echocardiography in Asymptomatic Pregnant Women to Detect Heart Disease**J. Josephine Hema¹, M. Sruthi², A. Manimegalai³**¹Associate Professor, Department of Obstetrics and Gynaecology, Madurai Medical College, Madurai, Tamilnadu²Assistant Professor, Department of Obstetrics and Gynaecology, Theni Medical College, Theni, Tamilnadu³Assistant Professor, Department of Obstetrics and Gynaecology, Theni Medical College, Theni, Tamilnadu

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Conflict of interest: Nil

Abstract:**Introduction:** Heart disease complicating pregnancy is an important cause of maternal mortality. Cardiovascular complications may develop in 0.2%–4% of pregnancies, even if no prior cardiac disease is known. Hence an early diagnosis of heart disease is important in pregnancy to decrease maternal morbidity and mortality.**Aim of the Study:** To identify heart disease in asymptomatic pregnant women with screening echocardiography.**Materials and Methods:** This is a prospective study conducted on pregnant women attending AN OPD in the Department of obstetrics and Gynaecology at Govt. Rajaji Hospital, Madurai. Screening ECHO was done in the women to identify heart diseases.**Results:** Out of 200 cases, 109 (54.5%) of the cases are in the age group of 20-24 years. Mean age of the study patients is 24.42 years. Out of 200 cases, 123 (61.5%) of the cases are Primi and remaining 77 cases (38.5%) are multi. Out of 200 cases, only 8 (4%) had family h/o heart disease and remaining 192 cases had (96%) had no family h/o of heart disease. Out of 200 cases, 11 (5.5%) cases had heart disease detected by ECHO and remaining 189 cases had (94.5%) no heart disease. Out of these 11 cases, 4 cases had CHD, 3 cases had Mild MS, 1 case each had Mild MR and Moderate MS, and 2 cases had Moderate MR. Valve area is significantly low (1.9) for heart disease cases when compared with normal cases (2.19). P value highly significant. < 0.001. LVEDD is significantly high (4.6) for heart disease cases when compared with normal cases (4.22). P value highly significant. < 0.001. RAEDD is significantly high (2.84) for heart disease cases when compared with normal cases (2.57). P value is significant. p=0.041. Mean RVEDD is low (2.2) for heart disease cases when compared with normal cases (2.42). But no statistical significant difference. P value not significant. p=0.109. Mean LAEDD is 3.39 for heart disease cases and 2.99 for normal cases There is no significant difference between normal and heart disease cases regarding LAEDD. p= 0.146 Not significant. Out of the 11 cases, 7 cases delivered by caesarean section and 4 cases had vaginal delivery there is no significant difference between mode of delivery and heart disease cases.**Conclusion:** Cardiac screening during pregnancy may seem to be an expensive process. However, the detection of cardiac diseases during pregnancy can be lifesaving, due to the fact that heart disease complicating pregnancy is a major cause of maternal death.**Keywords:** Pregnant women – asymptomatic – screening echo – heart diseases.

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Introduction

Heart disease complicating pregnancy is an important cause of maternal mortality, and cardiovascular complications may develop in 0.2%–4% of pregnancies, even if no prior cardiac disease is known [1].

Hence an early diagnosis of heart disease is important to decrease maternal morbidity and mortality. In the present study, by performing

routine cardiac screening among pregnant women in the first trimester, we aimed to diagnose heart disease and to determine the prevalence and distribution of heart disease and its potential risks among asymptomatic pregnant women [2].

Materials and Methods

The study was done on pregnant women attending antenatal OPD, at Govt Rajaji Hospital, Madurai from May 2022 to April 2023.

Study design: Study open label, Prospective

Study Period: 12 months

Sample design: Simple random sampling

Sample size: 200

Inclusion criteria: All Antenatal patients attending OPD

Exclusion criteria: Antenatal patients with known Heart Disease

These patients were grouped according to the trimester of pregnancy. Most of the patients in our study were in the first trimester. Detailed history taking and clinical examination were done. Basic investigations including urine routine, GCT, RFT and LFT were done. Echocardiogram was done in all patients using Phillips Echo machine. M mode, 2D, Doppler and colour flow mapping was done by standard methods.

Statistical Analysis: Data was described as mean \pm SD and percentage. Metric data was compared by Student's t test, whereas Non-metric data was compared by Chi square test and Mann-Whitney U test.

The Kolmogorov-smirnov test was used to assess normality of the distribution of the data $P < 0.05$ was considered as significant.

Results

Out of 200 cases, 109 (54.5%) of the cases are in the age group of 20-24 years. Mean age of the study patients is 24.42 years.

Out of 200 cases, 123 (61.5%) of the cases are Primi and remaining 77 cases (38.5%) are multi.

Out of 200 cases, only 8 (4%) had family h/o heart disease and remaining 192 cases had (96%) no family h/o of heart disease.

Out of 200 cases, 11 (5.5%) cases had heart disease detected by ECHO and remaining 189 cases had (94.5%) no heart disease.

Table 1: Heart Disease Detected By Echo

| Heart Disease Detected By Echo | No. Of Cases | Percentage |
|--------------------------------|--------------|------------|
| Yes | 11 | 5.5 |
| No | 189 | 94.5 |
| Total | 200 | 100 |

Out of 200 cases, 11 cases had heart disease. From these 11 cases, 4 cases had CHD, 3 cases had Mild MS, 1 case each had Mild MR and Moderate MS, and 2 cases had Moderate MR.

Table 2: Distribution of Heart Disease

| Heart Disease Type (Rheumatic) | No. Of Cases | Percentage |
|--------------------------------|--------------|------------|
| Mild MR | 1 | 0.5 |
| Moderate MR | 2 | 1 |
| Mild MS | 3 | 1.5 |
| Moderate MS | 1 | 0.5 |
| CHD | 4 | 2 |
| Total | 11 | 5.5 |

There is a significant difference between different types of heart disease vs valve area. P value is 0.012 significant.

Table 3: Comparison of Heart Disease Vs Valve Area

| Heart Disease | No. Of Cases | Valve Area | |
|---------------|--------------|-------------------|---------|
| | | Mean | Std Dev |
| CHD | 4 | 2.025 | 0.05 |
| Mild MR | 1 | 2 | 0 |
| Mild MS | 3 | 1.8 | 0.1 |
| Moderate MR | 2 | 2.05 | 0.07 |
| Moderate MS | 1 | 1.3 | 0 |
| Total | 11 | 0.012 Significant | |

LVEDD is significantly high (4.6) for heart disease cases when compared with normal cases (4.22). p value highly significant. < 0.001 .

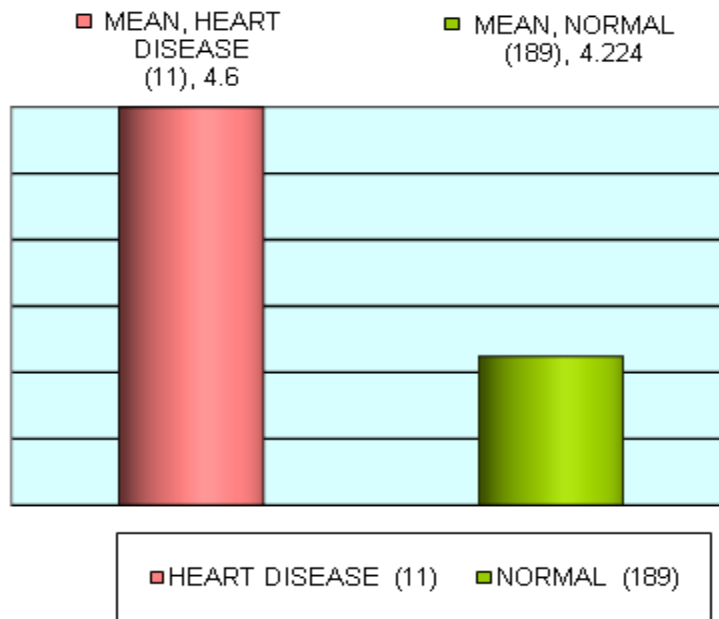


Figure 1: Comparison of LVEDD Heart Disease Vs Normal Cases

RAEDD is significantly high (2.84) for heart disease cases when compared with normal cases (2.57). p value is significant. p=0.041

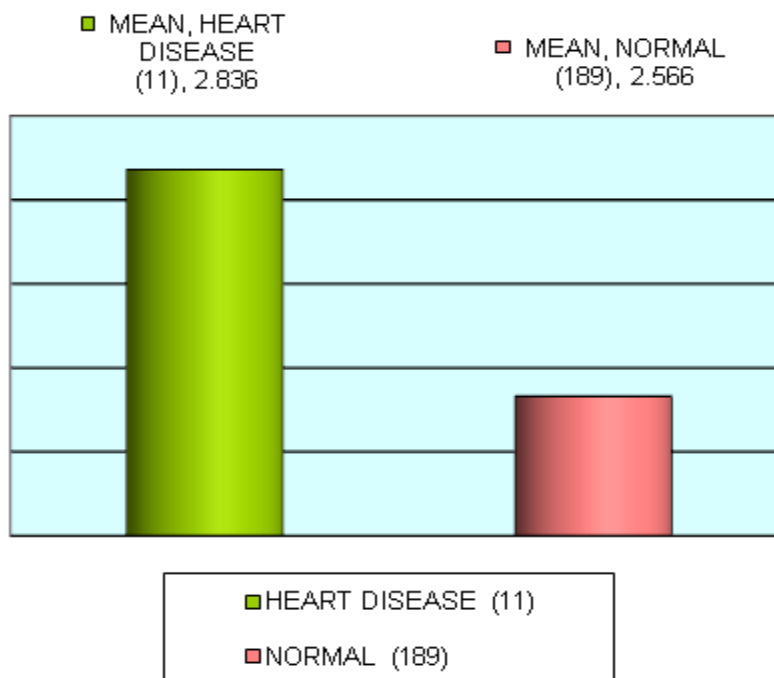


Figure 2: Comparison of RAEDD Heart Disease Vs Normal Cases

Mean RVEDD is low (2.2) for heart disease cases when compared with normal cases (2.42). But no statistical significant difference. P value not significant. p=0.109.

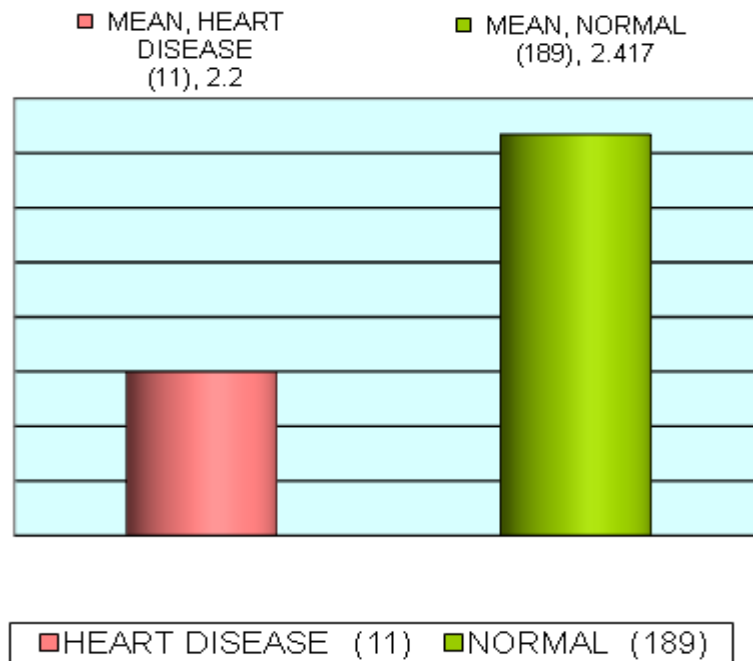


Figure 3: Comparison of RVEDD Heart Disease Vs Normal Cases

Mean LAEDD is 3.39 for heart disease cases and 2.99 for normal cases. There is no significant difference between normal and heart disease cases regarding LAEDD. $p=0.146$ Not significant

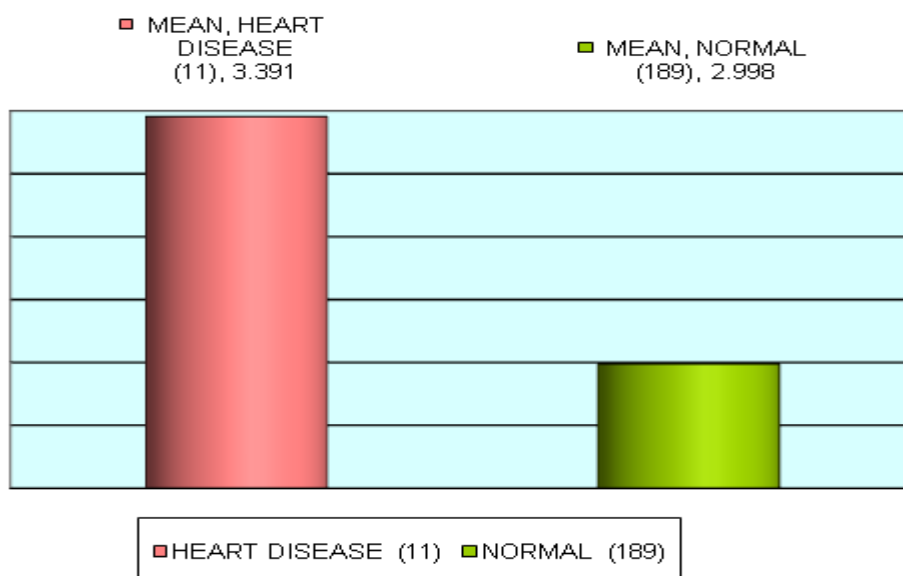


Figure 4: Comparison of LAEDD Heart Disease Vs Normal Cases

Out of 11 cases with heart disease, 7 cases delivered by caesarean and 4 cases by vaginal delivery.

Discussion

Undiagnosed heart disease during pregnancy is an important cause of maternal morbidity and mortality. Preterm birth, intrauterine growth retardation, low birthweight and unfavorable fetal outcomes like abortions and stillbirth are also

observed in pregnant women with heart disease³. The heightened risks faced by pregnant women demand great emphasis on timely detection so that prompt management can be instituted to prevent complications to mother and child. In pregnant women symptoms such as dyspnea, palpitations and loss in the effort capacity can mimic heart disease and so it may be difficult to suspect heart disease in pregnancy⁴. Therefore an early diagnosis of heart disease at the beginning of pregnancy gains

importance. Transthoracic echocardiography is most commonly used in diagnosing heart disease.

In the present study by performing routine cardiac screening among pregnant women in the first trimester we studied the prevalence and distribution of heart disease and its potential risk among asymptomatic pregnant women so that necessary precautions can be taken during the follow up to protect the mother and child [5].

Conclusion

Cardiac screening during pregnancy may seem to be an expensive process⁶. However, the detection of cardiac diseases during pregnancy can be lifesaving due to the fact that heart disease is a major cause of maternal death.

In our study, the rate of heart disease is 5.5% among healthy pregnant women in the first trimester. Identification of heart disease helps us for making necessary arrangements for the delivery and follow up during postpartum period⁷. Ideally baseline evaluation of cardiac function and heart disease should begin before conception. Hence, it is advisable to subject all pregnant women to

echocardiographic examination at least one time during pregnancy.

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