

Prevalence of Cardiovascular Diseases among Pregnant Women Attending Antenatal Care in Jimma University Medical Center, Southwest Ethiopia

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Abstract

Background

Pregnant women with underlying cardiovascular diseases (CVDs) are at increased risk for adverse maternal and perinatal outcomes due to difficulty in tolerating the physiologic changes of pregnancy.

Maternal CVDs are responsible for 10-15% of maternal death. Rheumatic heart disease is the commonest cardiac disease among pregnant women in developing countries. Despite all this, there is no adequate data on the overall prevalence of cardiovascular diseases among pregnant women in our setup as well as in Ethiopia.

Objectives

The aim of the study was to assess the prevalence of cardiovascular diseases among pregnant women who had antenatal care follow up at Jimma University Medical center from October 2021 to December 2021.

Methods

An institution based cross sectional study was conducted among pregnant women who had antenatal care follow up at Jimma University Medical Centre. We used systematic random sampling to get sample population. Data were collected by using structured questionnaire; sphygmomanometer, echocardiogram, and electrocardiogram. The data were then entered to Epi data and exported to SPSS Version 26 for statistical analysis. Descriptive data summarizations and presentations were done to find the prevalence of CVDs in the study population.

Result

A total of 156 pregnant women were enrolled in this study. The overall prevalence of cardiovascular disease was 16.7%; of which 10.3% had hypertensive disorders of pregnancy and 6.4% had cardiac disease. Preeclampsia accounted for 6.4% followed by gestational hypertension (2.6%) and chronic hypertension (1.3%). Chronic rheumatic heart disease accounted for 3.2%. atrial septal aneurysm (1.9%) and hypertensive heart disease (1.3%). In those with rheumatic heart disease, mitral valve lesions were the prominent. T wave abnormalities were the most common electrocardiography finding.

Most, 121(22.4%), of the study participants had at least one abnormal echocardiography finding and among them 64(41%) had abnormal valvular lesions. Among those with valvular lesions, 5 (3.2%) had chronic rheumatic heart disease whereas 59(37.8%) had physiologic valvular lesions.

Conclusion

The prevalence of cardiovascular diseases among third trimester pregnant women was high in our setup. So screening all pregnant women with electrocardiography and echocardiography is important.

Background

Cardiovascular diseases (CVDs) are the leading cause of death globally. An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke. Over three quarters of CVD deaths take place in low- and middle-income countries. Out of the 17 million premature deaths (under the age of 70) due to noncommunicable diseases in 2019, 38% were caused by CVDs (1–2).

In the similar manner, CVDs are the leading causes of non-obstetric maternal death during pregnancy (2). Maternal CVDs complicate between 1 and 4% of all pregnancy and responsible for 10–15% of maternal death. Nowadays, it has become the leading cause of maternal death globally (3–5).

The pregnant women are in a marked hyper-dynamic and volume-overloaded state as a result of physiological changes during pregnancy. Cardiac output increases by 30–50% during pregnancy and further increases during labor and delivery (6). Women with underlying heart disease cannot

tolerate these additional hemodynamic burden of pregnancy which may exaggerate the underlying disease, resulting in increased morbidity and mortality to the mother, fetus or both (3).

Heart disease in pregnancy represents a spectrum of etiologies including; cardiomyopathies, valvular heart disease (VHD), pulmonary hypertension, and adult congenital heart disease (7) and also ischemic heart disease and cardiac arrhythmias(8). Of these, rheumatic heart disease (RHD) is the most common in developing countries, mitral stenosis (MS) being the predominant lesion among all presentations, whereas cardiomyopathies and congenital heart disease are more common in developed countries (9).

A study done in Saint Paul's Hospital Millennium Medical College revealed that 10.3% of pregnant mothers had cardiovascular disease and a relatively high proportion of rheumatic heart disease was seen among the pregnant mothers (2). About 8.3% of the mothers have at least one echocardiographic abnormality out of which 2.3% had significant rheumatic heart disease and 1.0% of the mothers have moderate-severe pulmonary hypertension. In another echocardiographic study done in Eritrea, about 2.3% of the pregnant women showed subclinical RHD 95% CI (0.7–3.9) (10).

A study done by Moges Beriye et al showed that the prevalence of VHD in pregnant women was 0.6%. Out of a total of 29 pregnant women 28 (96.6%) had rheumatic heart disease. MS (75.9%) was the most frequent mitral valve pathology and 16 (55.2%) had severe MS (11) Likewise, a systematic review and meta-analysis done in Ethiopia in 2020 showed the pooled prevalence of hypertensive disorder of pregnancy to be 6.82% (12).

Despite all these, only few published findings are available concerning CVDs during pregnancy in Ethiopia and the national policy of Ethiopia does not give adequate emphasis on the burden of CVDs in pregnancy. Thus, this study is aimed at showing and filling this gap by assessing the burdens of cardiovascular diseases among pregnant women in Jimma University Medical Centre (JUMC). Hence, the findings of the study will be input for reviewing health policies at regional and national level.

Materials And Methods

Study Area, Design and Period

The study was conducted in JUMC. JUMC is a tertiary comprehensive hospital located in Jimma town, Southwest Ethiopia. The hospital has a catchment population of 20 million people. The study design was institution based cross-sectional study. The study commenced from October 2021 to December 2021.

Study population

We recruited pregnant women who were in the 3rd trimester of pregnancy who were in antenatal care follow up at JUMC during the study period. We used systematic random sampling technique to select the study populations.

Inclusion and Exclusion criteria

All women with confirmed 3rd trimester pregnancy and willing to participate in the study were included in the study. But, non-pregnant women who came for preconception counseling; those who were in the first and second trimester pregnancy; and those who were in 3rd trimester pregnancy but were not willing to give their written consent were excluded from the study.

Sample Size determination and sampling technique

Sample size was calculated using single population formula. The formula and calculation procedure is indicated below:

$$n = \frac{Z^2 P(1-P)}{d^2}$$
, Where n is sample size, Z is standard normal distribution value at 95% confidence level of $\alpha/2 = 1.96$, P is 10.3% (Is taken from the prevalence of cardiovascular diseases in St. Paul's Hospital Millennium Medical College (2)), and d = margin of error = 5%. Accordingly, the sample size is calculated as:

$n = (1.96)^2 \cdot 0.103(1-0.103)/0.0025 = 141.97 = 142$. We then added 10% non-response rate and got a sample size 156. Hence, we conducted the study on 156 third trimester pregnant women.

Data Collection procedure

Data were collected using structured questionnaire written in English and was translated to the local language the study participant can understand/speak. Data were collected on socio-demographic characteristics (age, education level, occupation, marital status, place of residence, income of the family, religion and ethnicity); and medical, obstetrics and gynecologic factors (hypertension, diabetes, kidney disease, Smoking, gravidity and parity, gestational age, number of living children, contraceptive use and type before the index pregnancy, functional status, previous history of admission and/or treatment due to cardiovascular disease, type of cardiovascular disease, and family history of chronic illnesses).

We used four medical doctors to collect questionnaire data and supervision was done by the principal investigator. The data collectors and supervisor applied COVID-19 precaution rules (Sanitizing hand, wearing gloves and face masks) and the study subjects also used followed the precaution rules. Social distance kept as much as possible

Blood pressure, echocardiography and electrocardiography assessment

Blood pressure was measured at both arms and the higher was taken. Clinical echocardiography screening was done using My alpha lab (ESAOTE S.p.A ,SN; 50384) and Samsung machines and electrocardiography was done using electrocardiogram machine SE-1200 Express model. These measurements were done after the women took 30 minutes rest. Urinalysis, renal function tests, liver enzymes and complete blood count were done for those who were hypertensive.

Data quality control

Quality of data was maintained by one day training of the data collectors. Pretesting of the questionnaire as a pilot was undertaken before the actual data collection. All filled questionnaires were checked for completeness and cleaned manually before the analysis by the principal investigator.

Data processing and analysis

The questioners was coded and entered into Epidata version 3.1 statistical software and then exported into Statistical Package for Social Science (SPSS) version 26 for further analysis. Data was summarized and presented using descriptive statistics. Logistic regression was computed to assess statistical association, and significance of statistical association was considered to be significant if P-value ≤ 0.5 .

Result

Socio-demographic characteristics of study participants

The mean age of the study participants was 25.97(± 4.6), with a minimum of 18 and maximum of 37 years. Majority of the participant pregnant mothers were from the Oromo ethnic group 96 (61.5%) followed by the Amhara ethnic group (16.7%) and Dawuro (6.4%). The Majority of them were Muslim by religion (54.5%) followed by Orthodox Tewahdo Christian (28.2%) and Protestant (16%).

The educational status of the majority of the participants were elementary school (32.1%) followed by higher education (28.8%) and secondary school (28.2). The occupational status of majority of the participants were housewife (61.5%) and, monthly income of majority of them was not adequate (48.7%). Majority of them were married (99.4%). Most of the study participants were from Jimma Zone, mostly from Jimma town. Socio-demographic data is summarized in table 1.

Obstetric characteristics of the study participant

Majority of study participants had 4 ANC visits and about 60% were two to four gravidity and one to four parity. Concerning contraception uses, about three-fourth were on contraception methods before the index pregnancy and depo Provera was the most frequently used. The pregnancy was planned in most of them (Please see table 2).

Medical History of the study participants

Nine (5.8%) of the study participants had previous admission; of whom three of them were admitted because of cardiovascular disease and six of them were admitted for other than cardiovascular diseases. Five (3.2%) of the study participants were diagnosed to have cardiovascular diseases before the index pregnancy of whom two (1.3%) were hypertensive and three (1.9%) were known to have cardiac disease.

Eight (5.1%) of the study participants had known co-morbid chronic illness other than cardiovascular disease and thirty-three (21.25%) had family history of chronic illness among whom majority had family history of hypertension 26(16.7%). Among the study participants, 27(17.3%) had dyspnea and most of them were in NYHA class I. The frequency and percent of orthopnea, PND and palpitation were 5(3.2%), 4(2.6%) and 20(12.8%) respectively. The detail of medical history of the women is indicated in supplementary table 1.

Physical Examination Findings of the study participants

The mean pulse rate of the study participants was 91.62(\pm 10.9). The mean systolic blood pressure was 115.54mmHg (\pm 13.7); the minimum was 90 mmHg and the maximum was 162mmHg. The mean diastolic BP was 74.69mmHg (SD = 10); the minimum was 60mmHg and the maximum was 110mmHg. The mean respiratory rate was 20.72(SD =1.6) with minimum of 20 and maximum of 36. The temperature and oxygen saturation were within normal range for all of the study participants. From the study participants, 16(10.3%) had hypertensive disorders of pregnancy. Please see table 3.

During physical examination of the study participants; two (1.3%) had pale conjunctiva, two (1.3%) had enlarged thyroid gland, one (0.6%) had displaced PMI, nine (5.8%) had murmurs from whom PR and MR were the frequent findings and fifteen (9.6%) had leg edema.

ECHOCARDIOGRAPHY FINDINGS OF THE STUDY PARTICIPANTS

Echocardiography findings are summarized in table 4. Most, 121(22.4%), of the study participants had at least one abnormal echocardiography finding and among them 64(41%) had abnormal valvular lesions. Among those with valvular lesions, 5 (3.2%) had chronic rheumatic heart disease whereas 59(37.8%) had physiologic valvular lesions.

Four (2.6%) study participants had anemia. One study participant had abnormal liver enzyme, AST, and the value was 67(1.8x elevated). The other liver enzymes were within normal range. Five (3.2%) of the study participants had proteinuria.

Among hypertensive disorders of pregnancy, preeclampsia was the predominant finding of which preeclampsia with severity features accounted for 37%. Among those with CRHD, 3.2% were in NYHA class 1 dyspnea, 0.6 % had orthopnea and 1.3% had palpitation.

Electrocardiogram Findings of the Study Participants

Table 5 summarized ECG findings of the study participants. Accordingly, most of the study participants, 132(84.6%), had at least one ECG abnormality from whom thirty four (21.8%) had sinus tachycardia; two (1.3%) had sinus bradycardia; six (3.8%) had premature ventricular beats and nine (5.8%) had left axis deviation. The result of ECG investigation also indicated that nine (5.8%) of the pregnant mothers had counterclockwise

rotation of transition zone, four (2.6%) had left anterior hemi-block, one (0.6%) had LVH and one (0.6%) had short PR interval.

T wave changes occurred in 103(66%) of the study participants whereas T wave inversion occurred in 83(53.2%) and most of the inversion occurred in V1, 75(48.1%), followed by lead III, 37(23.5%), and V2, 21 (13.5%). Flattening of T wave occurred in 47(30.1%) where most of the flattening occurred in lead III (21.2%). On the contrary, Q wave occurred in 26(14.7%) of the study participants which was mostly in lead III, 18(11.5%), and aVL, 5(3.2%). Low voltage of the ECG was seen in 16(10.2%) of the study participants mostly in aVF, aVL and lead III.

Overall prevalence of cardiovascular diseases

The prevalence of CVDs in our study population is 16.7. HDP was found in 10.3%; RHD was found in 3.2%; atrial septal aneurism was found in 1.0% and HHD was found is 1.3% (figure 1).

Discussion

From the result of this study, the prevalence of cardiovascular diseases among pregnant mothers attending ANC at JUMC was 16.7%. HDP and CRHD were the predominant findings. Of which HDP accounted for 10.3%, CRHD accounted for 3.2%, atrial septal aneurysm accounted for 1.9% and HHD accounted for 1.3%. Summing up all cardiac conditions together, the prevalence of cardiac disease was 6.4%. The overall prevalence of cardiovascular diseases was higher because of the increased prevalence of hypertensive disorders of pregnancy. In addition, one of the study participants had both HDP and CRHD and, two of the study participants had both HDP and HHD.

HDP was the predominant finding in this study which occurred in 16(10.3%) of the study participants; of which preeclampsia accounted for 6.4% followed by gestational hypertension which accounted for 2.6% of cases. This findings was higher than the previous study done a decade ago in Jimma University specialized Hospital, in which the overall prevalence of HDP were 8.5% from which severe preeclampsia was the predominant finding (51.9%) (13). The same was true in this study also, preeclampsia was the predominant finding which accounted for 62% of cases. The prevalence of preeclampsia in this study was lower than that of the studies done in Dessie referral hospital (8.4%) (14) and Mettu Karl referral hospital (12.4%) (15). The prevalence of HDP in this study was also higher than a study done in St. Paul's Hospital Millennium medical college in which the prevalence of HDP was 6.5% (2). But, it was lower than a study done among pregnant women attending ante natal care at Gondar town health Institutions, North West Ethiopia 2017, in which the prevalence of hypertensive disorders of pregnancy was 16.8% (16).

CRHD was the second predominant finding in this study, as it is the common finding in developing countries, occurred in 5(3.2%) of the study participants which was nearly similar to the study conducted in 2017 which reported that prevalence of definite RHD in rural Ethiopia to be 3.7% on population based echocardiographic study in Jimma Zone, South West Ethiopia (17). In this study, 5(3.2%) of the study participants had MR (4 moderate and 1 severe), 2(1.3%) of them had MS (1 moderate and 1 severe), 2 (1.3%) of them had TR (1 mild and 1 severe) and 2(1.3%) of them had mild AR. Two patients had moderate pulmonary hypertension. Mitral valve lesions were the commonest findings, from which MR was the predominant finding in contrary to other

studies in which MS was the most common rheumatic valvular lesion encountered during pregnancy (11, 18). This finding is similar to other studies done in India and Sudan (9, 19) in which rheumatic heart disease was the predominant cardiac finding in pregnant mothers. But the prevalence of RHD in this study was higher than the study done in St. Paul's Hospital ,Ethiopia and, Eritrea which showed to be (2.3%) (2, 10). In this study the mean age was 25.8 and the range was 23–30 which is similar to age range of RHD. Since RHD is the disease of poverty, all of the cases with RHD had no enough income. Among them, 60% had no adequate income and 40% had no income at all.

The 3rd predominant finding in this study was atrial septal aneurysm which occurred in 3(1.9%) of the study participants. This finding was lower than that of the study done in Turkey in which the prevalence of atrial septal aneurysm was 5.67% (20) .

The other major finding in this study was HHD which occurred in 2 (1.3%) of the study participants. Both of those study participants had moderate LVH and grade 1 diastolic dysfunction. This could be due to undiagnosed chronic hypertension with superimposed preeclampsia.

When we see the echocardiography findings, most of them had benign findings; 92(59%) of the study participants had mild pericardial effusion. This is thought to be related to hormone mediated volume retention mostly during the 3rd trimester pregnancy. This result was higher than other studies in which the prevalence of pericardial effusion in 3rd trimester pregnancy was 40% (21).Moreover, our study found mild regurgitation 59(37.8%), mostly from the pulmonic valve, which is due to the physiologic change in pregnancy. This finding is similar with Afari HA et al which found valvular regurgitation in tricuspid and pulmonic valves (21).The prevalence of LVH in this study was 3.8% which is less than other study in which the prevalence was 5–10% (21). In this study, 3(1.9%) of the study participants with moderate LVH had hypertensive disorders of pregnancy and 3 (1.9%) of the study participants with mild LVH had normal blood pressure. Blood pressure and LVH had significant correlation at the 0.01 level (2 tailed), Pearson correlation. The ejection fractions of the study participants were within normal range.

Most of the study participants, 132(84.6%), had at least one ECG abnormality. T wave changes occurred in 103(66%) of the study participants. T wave inversion occurred in 83(53.2%) and most of the inversions occurred in V1,75(48.1%) followed by lead III 37(23.5%) and V2 21 (13.5%).T wave flattening occurred in 47(30.1%) and most of the flattening occurred in lead III 33(21.2%) followed by aVF 15 (9.6%) and V1 10(6.4%).Peaked T wave occurred in 3(1.9%) of the study participants mostly fromV1 to V3.In the above description, the summation of T wave inversion with its components as well as T wave flattening is greater than the total T wave changes because one case may have more than one T wave abnormalities. This is similar to the study done in Nepal among 3rd trimester pregnant women which showed: - T wave inversion occurred mostly in V1 (88.3%), V2 (60%), lead III (43.3%) and T wave flattening occurred mostly in lead III (50%), V3 (30%) and aVF (13.3%) (22). This finding is also similar to another study which showed:-T wave inversion occurred mostly in V1 (84%), lead III (54%),V2 (20%) and T wave flattening occurred lead III (26%) and V1 (6%) (23).

Sinus tachycardia occurred in 34(21.8%) of the study participants ;this is because heart rate increases progressively with pregnancy, reaching a peak during the 3rd trimester (22, 24, 25, 26). Nine (5.8%) had left axis deviation which is similar to other studies (22, 23, 24);among them 2 of them had hypertensive disorders of

pregnancy and one of them had chronic rheumatic heart disease. One (0.6%) had short PR interval which is common in pregnancy due to physiologic changes and similar findings were seen also in another studies (22,24,25, 26 (22, 24, 25, 26). Six (3.8%) of the study participants had premature ventricular beats which is due to physiologic changes of pregnancy but the result of this study was lower than other studies which showed premature beats to be 59%% (27). This could be due to the single ECG recording we used for our study as this can miss some PVCs. In this study Low voltage of the ECG was seen in 16(10.2%) of the study participants mostly in aVF, aVL, lead III which is similar finding to another study (30) .Nine (5.8%) pregnant mother had counterclockwise rotation of transition zone, 4 (2.6%) had left anterior hemi-block, 1(0.6%) had LVH and 2(1.3%) had sinus bradycardia.

Twenty six (16.7%) of the study participants had Q wave in any lead ;mostly occurred in lead III which accounted for 11.5% followed by aVL which accounted for 3.2% and 1.3% in lead I. Similar finding was seen in a study done in Nepal in which the increased number of Q waves appeared in 3rd trimester pregnancy highly statistically significant in lead III (35%), II(30%) and aVL (18.3%) and statistically significant in lead I(18.3%) (22). Another study also showed similar findings with significantly increased occurrence of prominent Q waves in lead III (40%), aVF (38%) and II (26%) in 2nd and 3rd trimester of normal pregnancy (23).

Strength and Limitation of the study

This is the 1st prevalence study that included the ECG and echocardiography findings of 3rd trimester pregnant mothers and also findings of atrial septal aneurysm. This is the strength of the study. Therefore, it can be used as a base line study and can give an entry point to other researchers for further wider studies in the area. However, it had its own limitation. First, the study was done in a single center with small sample size. Therefore, it is difficult to generalize to larger population. Second, the study lacked follow-up ECG and Echocardiography investigation to see changes of the abnormalities overtime. That limited us from knowing the outcome of the abnormalities.

Conclusion

Prevalence of cardiovascular diseases among 3rd trimester pregnant women attending ANC follow-up clinic at JUMC was 16.7% of which hypertensive disorders of pregnancy accounts for 10.3% and cardiac diseases accounts for 6.4% .From hypertensive disorders of pregnancy; preeclampsia was the commonest finding accounting for 6.4% followed by gestational hypertension (2.6%). From the cardiac diseases RHD was the predominant finding accounting 3.2% of cases followed by atrial septal aneurysm (1.9%) and HHD (1.3%). In the case of RHD, mitral valve involvement was the predominant finding and MR was the commonest one and 1.3% of them have moderate pulmonary hypertension.

Most of the ECG findings showed T wave changes, mostly inversion followed by flattening. T wave inversions were commonly seen in V1 (48.5%) followed by lead III (23.5%) and V2 (13.5%). T wave flattening were seen commonly in lead III (21.2%) followed by aVF (9.6%).

In the similar manner, the major echocardiography findings among the 3rd trimester pregnant women attending ANC follow-up clinic at JUMC were mild pericardial effusion and mild valvular regurgitation, commonly from

pulmonary valve. Most ECG and ECHO findings are physiologic changes of pregnancy. So interpretation should be with consideration of these findings.

Declarations

Ethics approval and consent to participate

The study was approved by Jimma University Institute of Health's Institutional Review Board. Written informed consent was taken from the study participants. Written informed consent was obtained from each participant and participant's anonymity and confidentiality was kept.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

1 has contributed to the study designs, clinical concepts, document writing and conceptualization, editing final documents, data analyses, and interpretation.

2 has contributed to the study designs, clinical concepts, document writing and conceptualization, editing final documents.

3 has contributed to the study designs, clinical concepts, document writing and conceptualization, editing final documents, data analyses, interpretation, preparing and reviewing the whole documents. He is the guarantor.

4 has contributed to the study designs, clinical concepts, document writing and conceptualization.

5 has contributed to preparing and reviewing the whole documents.

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Abbreviations

ANC- antenatal care

AR-Aortic regurgitation

CVDs-Cardiovascular disease

HD-Heart Disease

HDP-Hypertensive disorders of pregnancy

HHD-Hypertensive heart disease

JUMC-Jimma University Medical Center

MR-Mitral regurgitation

MS-Mitral stenosis

NYHA-New York heart association

PH-Pulmonary hypertension

PR-Pulmonary regurgitation

PVCs- Premature ventricular beats

RHD-Rheumatic Heart Disease

TR-Tricuspid regurgitation

VHD-Valvular Heart Disease

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Tables

Table1: Socio-demographic characteristics of 3rd trimester pregnant women who were attending ANC follow-up clinic at JUMC, Southwest Ethiopia, 2022.

Variable		FREQUENCY	PERCENT
Age	≤25	83	53.2
	26_35	68	43.6
	≥36	5	3.2
Ethnicity	Oromo	96	61.5
	Amhara	26	16.7
	Dawuro	10	6.4
	Yem	7	4.5
	Kaffa	7	4.5
	Gurage	5	3.2
	Other	5	3.2
Religion	Muslim	85	54.5
	Orthodox Tewahdo Christian	44	28.2
	Protestant	25	16
	Adventist	2	1.3
Educational Status	No formal education	17	10.9
	Elementary school	50	32.1
	Secondary school	44	28.2
	Higher education	45	28.8
Occupational Status	Housewife	96	61.5
	Merchant	4	2.6
	Employee	45	28.8
	Daily labourer	11	7.1
Monthly income	Adequate	29	18.6
	More than enough	1	0.6
	Not adequate	76	48.7
	No income	50	32.1
Marital Status	Married	155	99.4
	Widowed	1	0.6

Table2 Obstetric profile of 3rd trimester pregnant women who were attending ANC follow-up clinic at JUMC, Southwest Ethiopia, 2022.

Variable		Frequency	Percent
Gravidity	1	52	33.3
	2-4	92	59
	≥5	12	7.7
Parity	0	62	39.7
	1-4	93	59.6
	≥5	1	0.6
ANC visit	Yes	156	100
	No	0	0
No- of ANC visit	1	24	15.4
	2	19	12.2
	3	33	21.2
	4	47	30.1
	>4	33	21.2
Use of contraception method before	Yes	118	75.6
	No	38	24.4
Type of contraceptive Method	OCP	19	12.2
	Implanon	45	28.8
	Depo provera	63	40.4
	IUCD	4	2.6
Pregnancy	Planned	132	84.6
	Unplanned	24	15.4

Table 3 Physical examination findings of 3rd trimester pregnant women who were attending ANC follow-up clinic at JUMC, Southwest Ethiopia, 2022.

Variables		Frequency	Percent
Pale conjunctiva		2	1.3
Enlarged thyroid gland		2	1.3
Displace PMI		1	0.6
Murmurs	MR	4	2.6
	MS	1	0.6
	TR	1	0.6
	PR	6	3.8
Edema	Grade 1	9	5.8
	Grade 2	6	3.8

Table 4: Echocardiography abnormalities of 3rd trimester pregnant women who were attending ANC follow-up clinic at JUMC, Southwest Ethiopia, 2022

Variables		Frequency	Percent
Echocardiography	Abnormal	121	77.6
Valvular lesions		64	41.0
Mitral stenosis	Moderate	1	0.6
	Severe	1	0.6
Mitral regurgitation	Mild	4	2.6
	Moderate	4	2.6
	Severe	1	0.6
Aortic regurgitation	Mild	2	1.3
Tricuspid regurgitation	Mild	8	5.1
	Moderate	1	0.6
Pulmonic regurgitation	mild	57	36.5
Causes of valvular lesions	CRVHD	5	3.2
	Physiologic	59	37.8
LVH	Mild	3	1.9
	Moderate	3	1.9
Diastolic dysfunction	Grade 1	2	1.3
Hypertensive heart disease		2	1.3
Pulmonary hypertension	Moderate	2	1.3
Pericardial effusion	Mild	92	59
Atrial septal aneurysm		3	1.3

Table 5 General ECG abnormalities of 3rd trimester pregnant women who were attending ANC follow-up clinic at JUMC, Southwest Ethiopia, 2022.

Variables	Frequency	Percent	
Sinus tachycardia	34	21.8	
Sinus bradycardia	2	1.3	
Premature ventricular beats	6	3.8	
Left axis deviation	9	5.8	
Short PR interval	1	0.6	
Counter clockwise rotation of transition zone	9	5.8	
Left anterior hemi-block	4	2.6	
LVH	1	0.6	
Poor R wave progression	9	5.8	
P wave	Biphasic V1 and lead 2	2	1.3
	Inverted lead 3	1	0.6
	Peaked V1	2	1.3
T wave changes	103	66	
Q wave changes	26	16.7	
Low voltage	16	14.7	
S1Q3T3	1	0.6	

Figures

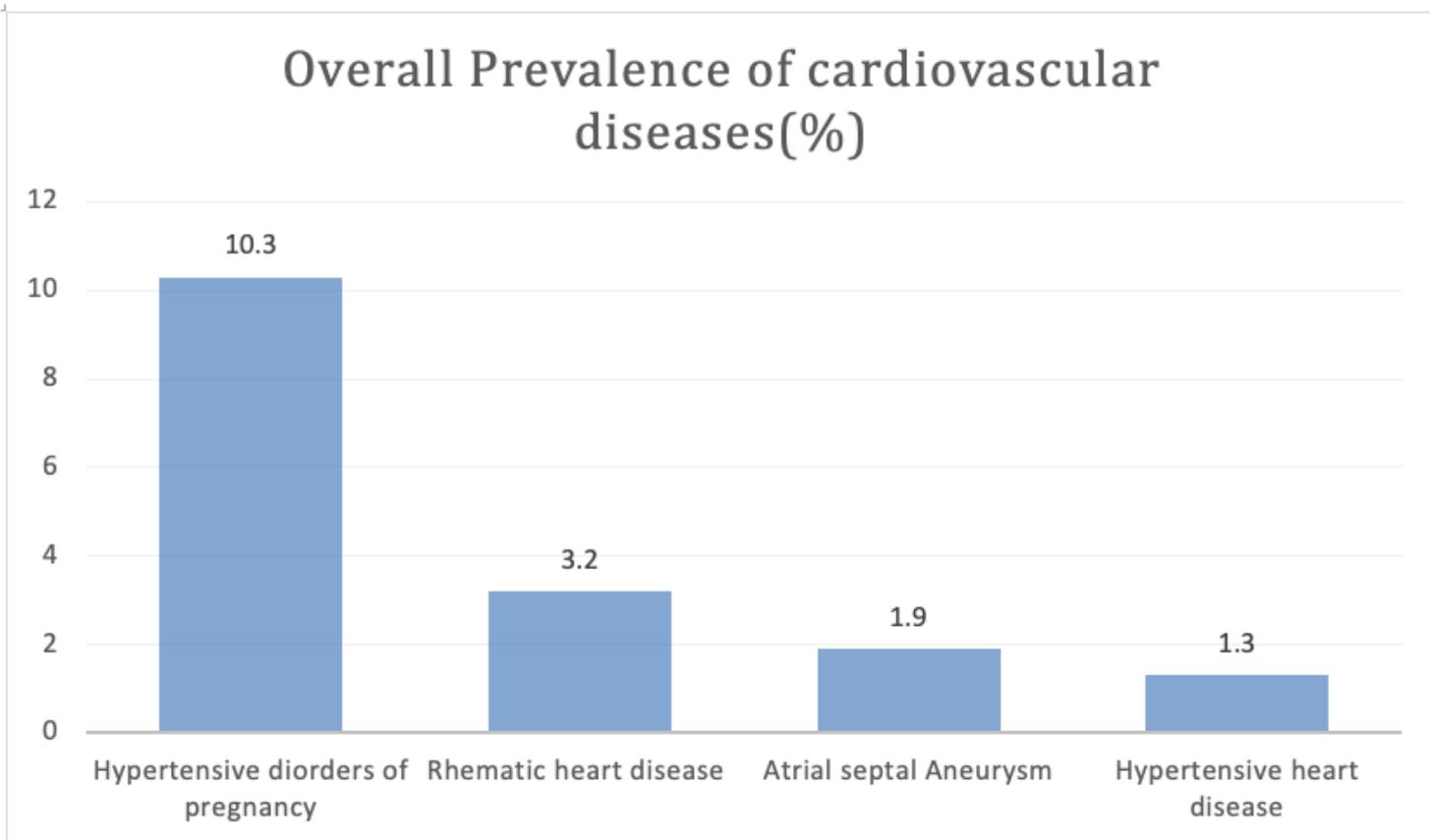


Figure 1

Bar graph- Overall prevalence of cardiovascular diseases among 3rd trimester pregnant women who were attending ANC follow up clinic at JUMC, Southwest Ethiopia, 2022.

Supplementary Files

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