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A STUDY OF PERIPARTUM CARDIOMYOPATHY AMONG CASES OF PREECLAMPSIA AND ECLAMPSIA.

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ABSTRACT Peripartum cardiomyopathy is a rare complication in pregnancy but is more commonly found in the patients of preeclampsia and eclampsia. The purpose of study is to evaluate incidence of peripartum cardiomyopathy among cases of preeclampsia and eclampsia. This is a prospective observational study. A total of 190 cases of preeclampsia and eclampsia were studied for features of PPCM and subjected to echocardiography. Out of 190 subjects, 3.7% had findings suggestive of PPCM. Incidence of PPCM was 0.009 per year among cases of pre-eclampsia and eclampsia and the incidence of PPCM among 6028 deliveries was 0.001 per year.

KEYWORDS : peripartum cardiomyopathy, preeclampsia, eclampsia, echocardiography.

INTRODUCTION

PPCM is a rare form of dilated cardiomyopathy of unknown origin, that is unique to the pregnant women of all reproductive ages.[1,2,3]The real incidence is unknown. It affects previously healthy pregnant women with a low incidence of 0.1% of pregnancies but has a high morbidity and mortality rate ranging from 7% to 50%.[3,4,5] The precise incidence in India is not known, an incidence of one case per 1374 live births has been reported from a tertiary care hospital from South India[6]. Reported incidences range from 1 in 299 live births in Haiti,[7] to 1 in 100 in Northern parts of Nigeria[7,8] to 1 case per 6000 live births in Japan,[9] to 1 in 1000 in South Africa,[10] to 1 in 2229 live births in Southern California,[11] to 1 in 4000 live births in the United State.[12] There is wide variation in the incidence of PPCM because the diagnosis is not always consistent and a comparison with age-matched non-pregnant women does not exist.[9,12,13]

Peripartum cardiomyopathy (PPCM) is defined as the development of cardiac failure between the last month of pregnancy and 6 months postpartum, the absence of an identifiable cause, the absence of recognizable heart disease prior to the last month of pregnancy, and left ventricular systolic dysfunction demonstrated by classic echo cardiographic criteria.[14,15,12,16,17,18]

Modified PPCM diagnostic criteria includes 3 clinical and 1 echocardiographic criteria. These are –

Clinical Criterias-

1. The development of heart failure in the last month of pregnancy or first 6 months postpartum.
2. The absence of a identifiable cause for cardiac failure.
3. The absence of recognizable heart disease prior to last month of pregnancy.

Echocardiographic Criterias-

1. LVEF(Left Ventricular Ejection Fraction) < 45%
2. FS(Fractional shortening) <22%
3. LVEDD(Left Ventricular End Diastolic Dimension) >2.7 cm/m^2 BSA or > 5.5 cm.

Peripartum cardiomyopathy has a very variable clinical course. Its diagnosis remains a challenge. The major risk factors include multiparity and advanced maternal age. Others include obesity, history of cardiac disorders like myocarditis, smoking, alcohol, use of certain drugs, preeclampsia and black race.

A study conducted in the United States observed a strong association with hypertension. This creates a dispute as to whether increased blood pressure may be a cause of heart failure seen in patients with peripartum cardiomyopathy.

The pathophysiology is still controversial. The basis of human PPCM cannot be explained by a single etiology, thus, the disease has multifactorial origin.[18]

The clinical presentation and haemodynamic changes are similar to any other form of dilated cardiomyopathy which includes new or rapid onset of dyspnea, cough, chest pain, palpitations, fatigue etc. Physical examination will reveal tachycardia, peripheral edema, pulmonary edema, ascites and hepatomegaly. Arrhythmias are a common phenomenon which is responsible for the embolic episodes. In some patients, the clinical and echocardiographic status improve rapidly and may return to normal while for others it may progress and the clinical condition rapidly worsens, even with medical therapy to chronic cardiac failure and sudden cardiac death.[12,19]

In acute cases, treatment may involve the use of intravenous vasodilatation, inotropic medications, an intra-aortic balloon pump, ventricular-assist devices, and extracorporeal membrane oxygenation. In severe cases, women experience a rapid deterioration in health without improvement even with medical therapy, and may require cardiac transplantation or die of heart failure, thrombo-embolic events and cardiac arrhythmias. However, the initial severity of left ventricular dysfunction or dilatation is not necessarily predictive of long-term functional outcome.[19] Survivors of PPCM often recover from the left ventricular dysfunction, however, they may be at risk of recurrence for heart failure and death in subsequent pregnancies.

This study was carried out:

- To find out patients having clinical features suggestive of PPCM.
- To find out how many of these cases have deranged myocardial function which is suggestive of peripartum cardiomyopathy thereby finding out the incidence of these cases in preeclampsia and eclampsia.
- To study the parameters of 2D- echocardiography
  - ✓ Left ventricular dimensions (LVEDD & LVESD)
  - ✓ Left ventricular fractional shortening (FS)
  - ✓ Left ventricular ejection fraction (LVEF).

METHODS

The present study was a prospective observational study carried out between 1st march 2017 to 31st august 2018 in the

department of obstetrics & gynaecology and non invasive echocardiography lab Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur after obtaining ethical committee approval. All the women admitted with diagnosis of preeclampsia and eclampsia was taken for study. Out of 800 admitted preeclampsia and eclampsia patients 190 cases selected by taking every 4th case as study subjects through systematic sample selection. Echocardiography of all patients was done either antepartum or postpartum before discharge. If patient was very critical on ventilator then echo cardiography was done after she is weaned. Patients were accessed for symptoms and signs of peripartum cardiomyopathy.

Patients necessary sociodemographic details, vitals, symptoms and sign of impending eclampsia, blood investigation, obstetric history, gestational age at the time of admission, mode of delivery, maternal outcome and neonatal outcome also recorded in proforma. All these data was then entered in a structured schedule in microsoft excel sheet. All the records rechecked for completeness and consistencies. Non numeric entries were coded into nominal/ordinal distribution before analysis.

Categorical variables were summarized in frequency and percent distribution and Chi square test was performed as appropriate and Fischer's Exact test was applied where frequency was < 5. Correlation coefficient analysis was applied to measure strength of association. Total 7 cases of PPCM diagnosed during period of study.

RESULTS

Incidence of PPCM in this study is 0.009 per year among cases of pre-eclampsia and eclampsia. During the study period no case of PPCM is observed among normotensive women and the incidence of PPCM among 6028 deliveries is 0.001 per year.

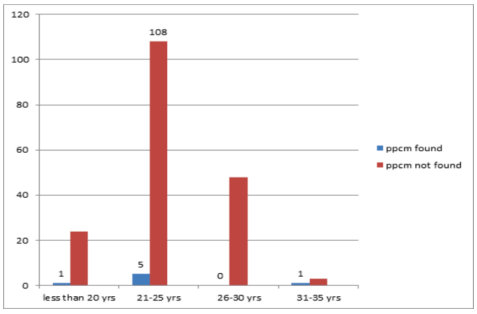

Figure 1: distribution of study subjects according to echo findings in different age groups

Figure 1 shows 71.4% of subjects having PPCM belongs to age group of 21-25 yrs. In the present study mean age of study subjects was 24.04 years and mean age of PPCM patients was 24.57 years.

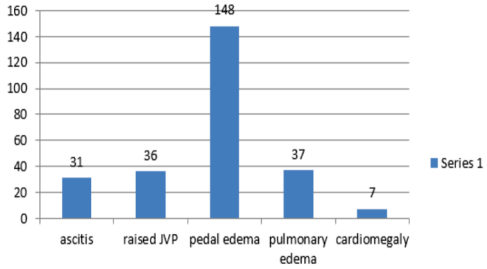

Figure 2: Signs of ppcm

Figure 2 shows that out of 190 study subjects 148 cases(77.9%) had pedal edema, 37(23.1%) had pulmonary edema, 36(18.9%) had raised JVP, 31(16.3%) had ascites, 7(3.7%) had cardiomegaly.

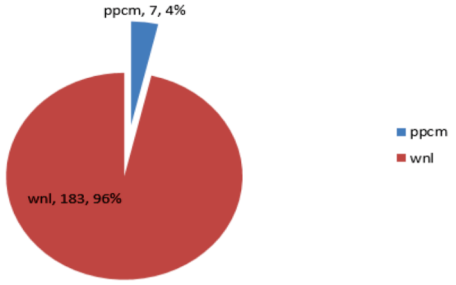

Figure 3: distributions of study subjects according to their echocardiographic findings

Figure 3 shows that out of 190 case study 7 cases(3.7%) had findings of PPCM, rest 183 cases(96.3%) had eco cardiographic findings within normal limit.

Figure 4: distribution of study subjects according to echo cardiographic parameters

Echocardiographic parameter		Frequency	Percent	Mean ± SD
LVEDD (cm)	≤5.5	180	94.7	4.64 ± .45
	>5.5(raised)	10	5.3	
FS(%)	≤ 22	4	2.1	29.87 ± 1.9
	23-30	156	82.1	
	>30	30	15.8	
LVEF(%)	≤45	4	2.1	59.73±4.05
	>45	186	97.9	

Figure 4 shows that LVEDD mean ± SD values was 4.64 ± 45 . Maximum LVEDD was 6.2 and minimum was2.6. Mean LVEDD of PPCM cases was 5.65 ± .29 cm.

FS mean ± SD was 29.87 ±1.9 . Maximum value of 32% and minimum of 15%. Mean FS of PPCM cases was 21.42 ± 4.23 %. LVEF mean ± SD values was59.73 ±4.05 . Maximum LVEF was 65% and minimum LVEF was 30%. Mean LVEF of PPCM cases was 41.65 ± 6.6 %.

DISCUSSION

In our study mean age of study subjects was 24.04 years and mean age of PPCM patients was 24.57 years. A study carried out by Suri et al mean age for PPCM is 28.3 years[20] and by GS Prasad et al is 25.25 years[21]. A study by Shakira Parveen et al quoted that in South Asian population preponderance of PPCM towards young age could be due to early age at marriage.

In our study out of 190 study subjects 148 cases(77.9%) had pedal edema, 37(23.1%) had pulmonary edema, 36(18.9%) had raised JVP, 31(16.3%) had ascites, 7(3.7%) had cardiomegaly.

In our study 3.7% (7 Cases) were diagnosed with PPCM out of the total 190 pre-eclampsia and eclampsia subjects studied.

In 2D-Echocardiographic finding of 7 PPCM subjects mean LVEDD was 5.65 ± .29 cm , mean FS was 21.42 ± 4.23 % , mean LVEF was 41.65 ± 6.6 % .

A prospective study conducted by Ntobeko B. A. Ntusi et al they found that in HHFP cases mean LVEDD was 5.1 ± 0.9 cm, mean LVEF was 49.9 ± 18.7 % , mean FS was 26.2 ± 3.2 % .In HHFP they included cases of PPCM associated with any form of hypertension. In the above mentioned study 85 % patients of HHFP presented with heart failure in last month of gestation before delivery. In our study heart failure in all PPCM patients developed within 1 week after delivery in the postpartum period[22].

In study conducted by GS Prasad et al mean LVEDD in PPCM

cases was 5.8 cm , mean LV FS was 15.9 % , mean LVEF was 26.3 %[21].

In study by Kathryn J. Lindley et al, patients with PPCM having preeclampsia had mean LVEDD of 5.2 ± 0.51 cm and mean LVEF of 29.6 ± 8.7 % in echocardiographic study.

CONCLUSION

Out of 190 selected subjects, seven cases were diagnosed with PPCM. Incidence of PPCM was 0.009 per year among cases of pre-eclampsia and eclampsia. During the study period no case of PPCM was observed among normotensive women and the incidence of PPCM among 6028 deliveries was 0.001 per year. In support of our study there are no previous studies available at present. Various studies have been done to implicate preeclampsia as a risk factor for PPCM. Similar studies can be conducted at other health institute to obtain more data regarding this subject.

REFERENCES

1. Nelson-Piercy C. Heart disease in pregnancy. In: Edmonds DK, editor. Dewhurst's Textbook of Obstetrics And Gynaecology. 7th ed. UK: Oxford, Blackwell Science Ltd; 2007. pp. 236–45.
2. Hilfiker-Kleiner D, Sliwa K, Drexler H. Peripartum cardiomyopathy: Recent insights in its pathophysiology. Trends Cardiovasc Med. 2008;18:173–9.
3. Sovndal S, Tabas JA. Cardiovascular disorders in pregnancy. In: Pearlman MD, Tintinalli JE, Dyne PL, editors.Obstetric and Gynecologic Emergencies: Diagnosis and Management. 1st ed. New York: McGraw-Hill Medical Publishing Division; 2004. pp. 300–9.
4. Tidswell M. Peripartum cardiomyopathy. Crit Care Clin. 2004;20:777–88.
5. Sliwa K, Skudicky D, Bergemann A, Candy G, Puren A, Sareli P. Peripartum cardiomyopathy: Analysis of clinical outcome, left ventricular function, plasma levels of cytokines and Fas/APO-1. J Am Coll Cardiol.2000;35:701–5.
6. Pandit V, Shetty S, Kumar A et al; Incidence and outcome of peripartum Cardiomyopathy from a tertiary hospitalin South India. Trop Doct 2009;39:168-9.
7. Sanderson JE, Adesanya CO, Anjorin FI, Parry EH. Postpartum cardiac failure: Heart failure due to volume overload? Am Heart J. 1979;97:613–21.
8. Davidson NM, Parry EH. Peri-partum cardiac failure. Q J Med. 1978;47:431–61.
9. Sliwa K, Fett J, Elkayam U. Peripartum cardiomyopathy. Lancet. 2006;368:687–93.
10. Desai D, Moodley J, Naidoo D. Peripartum cardiomyopathy: Experiences at King Edward VIII Hospital, Durban, South Africa and a review of the literature. Trop Doct. 1995;25:118–23.
11. Mielniczuk LM, Williams K, Davis DR, Tang AS, Lemery R, Green MS, et al. Frequency of peripartum cardiomyopathy. Am J Cardiol. 2006;97:1765–8.
12. Pearson GD, Veille JC, Rahimtoola S, Hsia J, Oakley CM, Hosenpud JD, et al. Peripartum cardiomyopathy: National Heart, Lung, and Blood Institute and Office of Rare Diseases (National Institutes of Health) workshop recommendations and review. JAMA. 2000;283:1183–8.
13. James PR. A review of peripartum cardiomyopathy. Int J ClinPract. 2004; 58:363–5.
14. Sliwa K, Fett J, Elkayam U. Peripartum cardiomyopathy. *Lancet*. 2006; 368: 687–93.
15. Nelson-Piercy C. Cardiac disease. In: Luesley DM, Baker PN, editors. Obstetrics and Gynaecology: An Evidence-Based Text For MRCOG. 1st ed. London: Arnold; 2004. pp. 54–8.
16. Nelson-Piercy C. Heart disease in pregnancy. In: Edmonds DK, editor. Dewhurst's Textbook of Obstetrics And Gynaecology. 7th ed. UK: Oxford, Blackwell Science Ltd; 2007. pp. 236–45.
17. Hibbard J U, Lindheimer M, Lang R M. A modified definition for peripartum cardiomyopathy and prognosis based on echocardiography. Obstet Gynecol. 1999;4:311–5.
18. Johnson-Coyle L, Jensen L, Sobey A American College of Cardiology Foundation, American Heart Association. Peripartum cardiomyopathy: Review and practice guidelines. Am J Crit Care. 2012;21:89–98.
19. Elkayam U, Tummala PP, Rao K, Akhter MW, Karaalp IS, Wani OR, et al. Maternal and fetal outcomes of subsequent pregnancies in women with peripartum cardiomyopathy. N Engl J Med. 2001;344:1567–71.
20. Suri V, Aggarwal N, Kalpdev A, Chopra S, Sikka P, Vijayvergia R. Pregnancy with dilated and peripartum cardiomyopathy: maternal and fetal outcome. Arch Gynecol Obstet. 2013;287:195–9.
21. Prasad G S, Bhupali A, Prasad S, Patil A N., Deka Y. peripartum cardiomyopathy – case series.
22. Ntusi NBA, Badri M, Gumedze F, Sliwa K,Mayosi BM (2015) Pregnancy-Associated Heart Failure: A Comparison of Clinical Presentation and Outcome between Hypertensive Heart Failure of Pregnancy and Idiopathic Peripartum Cardiomyopathy. PLoS ONE 10(8): e0133466.doi:10.1371/journal.