DYSPNEA IN PREGNANCY-INCIDENCE AND COMMON CAUSES

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ABSTRACT

Objective: To determine incidence of dyspnea in pregnant patients and major underlying causes in these patients and relation of grade of dyspnea and disease with mortality.

Study Design: Prospective cohort study.

Place and Duration of Study: Obstetrics and Gynaecology ward of Armed Forces Institute of Cardiology/ National Institute of Heart Disease (AFIC/NIHD) and Obstetrics and Gynaecology department of Military Hospital Rawalpindi, from Jan 2017 to Jun 2017.

Material and Methods: All patients complaining of dyspnea NYHA II-IV were enrolled from second trimester onwards (>13 weeks). Those undergoing miscarriage, termination of pregnancy and already diagnosed cardiac, pulmonary, thyroid or blood disorders were excluded. Thorough physical examination and laboratory tests to exclude common causes of dyspnea like blood Complete Picture, thyroid function tests, x-ray chest and Echocardiography were done. Patients were followed every month till delivery.

Results: Over all incidence of dyspnea was 40% amongst all obstetric patients. In 35% patients no cause was found and 5% had an underlying cause for dyspnea. Mean age 28.5 ± 5 years, Parity 2 ± 1.4, Period of gestation (POG) at diagnosis was 29.5 ± 3.3 weeks, POG at delivery was 36 weeks ± 1.5 weeks, frequency of NYHA class 2,3,4 was 68%, 28% and 4% respectively. Most common cause of dyspnea was anemia 1050 (87.5%), Cardiac disease 87 (7.2%), pulmonary disease 35 (2.9%) thyroid disease 8 (0.66%) and others 20 (1.66%). Mortality ratio was 220/100,000 live births. Out of mortalities 8% were due to cardiac disease compared to 0.3% due to anemia. All the mortalities were in patients who presented with grade 3 and 4 dyspnea.

Conclusion: Dyspnea should not be ignored as a normal symptom due to pregnancy changes. It could be the sole manifestation of underlying life threatening disease. Some diseases with a high prevalence like anemia can be identified and treated easily during antenatal period. Early recognition and evaluation can save many precious lives.

Keywords: Cardiac disease, Dyspnea, Pregnancy.

INTRODUCTION

Dyspnea during pregnancy is quite common, occurring by most estimates in approximately 60% of women with exertion and less than 20% at rest[1]. This symptom is so common that it usually is referred to as physiologic dyspnea. Dyspnea during pregnancy can be a result of the pregnancy itself however, other causes of dyspnea should be kept in mind including hematologic, cardiac, and pulmonary etiologies[2]. The exact mechanism of dyspnea during pregnancy is not yet known, however, it may be due to increased metabolic needs or mechanical causes during pregnancy. Cardiopulmonary signs and symptoms of normal pregnancy may simulate heart disease. These include easy fatigability, palpitations and dyspnea. It has been reported that 0.2-0.4% of all pregnancies are complicated by cardiovascular disease[3], and although death is rare, cardiovascular disease is the biggest indirect cause of maternal death worldwide, with an attributable rate of two deaths per 100,000 in the UK and a similar rate in other countries[4]. Cardiac assessment of the pregnant patient can be difficult as common symptoms of pregnancy, such as breathlessness and fatigue, can mimic cardiac symptoms. Other symptoms mimicking cardiac disease are orthopnea, chest pain, tachycardia and syncope.

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Signs and symptoms which are abnormal in pregnancy include extreme breathlessness, marked edema, a fourth heart sound, diastolic murmurs, jugular venous pressure of >2 cm and a persistent tachycardia of >100 beats per minute[5]. So any one of these should prompt further evaluation.

Possible explanations for pregnancy-associated benign dyspnea include changes in chest wall conformation, diaphragm positioning, or altered respiratory center sensitivity[5].

Anemia affects almost two-thirds of pregnant women in developing countries and contributes to maternal morbidity and mortality and to low birthweight babies. The prevalence of anemia among pregnant women living in urban areas is similar, ranging from 29% to 50% among pregnant women attending antenatal clinics in a large private, tertiary hospital in Karachi[6]. Anemia has a variety of contributing factors including nutritional, genetic, frequent pregnancies, multiparity, abortions and infectious disease, however, iron deficiency is the cause in 75% of cases[7]. The major causes of iron deficiency include insufficient intake of iron-rich foods and poor bioavailability of consumed iron in relation to the need during pregnancy. Prevalence of iron deficiency anemia among women in developing countries was calculated from 40% to 88%[8]. The prevalence of hyperthyroidism in pregnancy is about 0.2% to 2.5%[9]. The most common cause is Graves' disease. Production of thyroid hormones and iodine requirement both increases by approximately 50% during pregnancy as part of physiology[9]. American Thyroid Association recommends >2.5 and >3.0 µIU/ml as cutoff range for diagnosis of hypothyroidism during the first and later part of pregnancy, respectively[10]. Chest infections including pneumonia, tuberculosis are common amongst pregnant patients also due to high prevalence in this area. Amniotic fluid embolism is a rare (1 case per 8000-80,000 births) but potentially catastrophic complication, with a mortality rate of 10-80%[11]. Pulmonary edema may rarely occur in association with 3% of preeclampsia cases. Asthma is one of the most common coexisting medical conditions affecting reproductive-aged woman. Pregnant patients are at risk of developing ARDS from obstetric complications and from nonobstetric conditions. Obstetric complications, such as amniotic fluid embolism, chorioamnionitis, trophoblastic embolism, and placental abruption, can produce acute lung injury[11]. There is also anxiety related dyspnea that occurs in a background of emotionally stress which is known as psychogenic dyspnea[12].

This study was conducted to determine the incidence of dyspnea amongst pregnant patients which are a vulnerable group, as some signs and symptoms could be ignored considering them due to pregnancy. Life threatening underlying causes which could endanger the life of mother and fetus will remain undiagnosed if their importance in not understood.

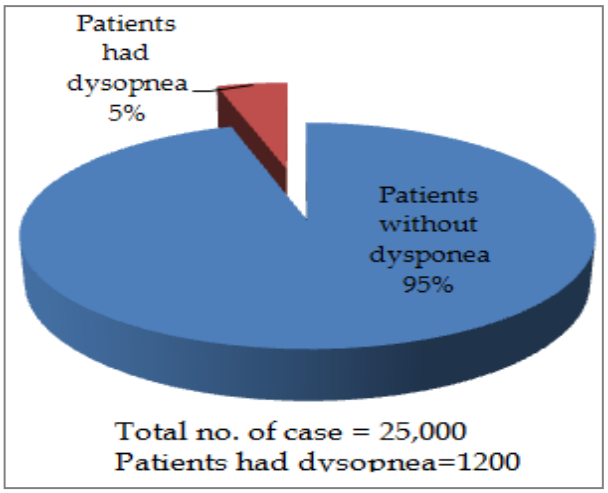

Figure-1: Incidence of dyspnea with a cause.

MATERIAL AND METHODS

This was a prospective cohort study conducted at obstetrics and gynecology ward of Armed Forces Institute of Cardiology/National Institute of Heart Disease (AFIC-NIHD) and obstetrics and gynecology department of Military Hospital Rawalpindi from Jan to Jun 2017. All the pregnant patients presenting with New York Heart Association Classification class >II dyspnea were included by consecutive non probability sampling technique after informed consent and Institutional Review Board approval, from

second trimester (13 weeks) onwards with a live fetus. Those undergoing miscarriage, termination of pregnancy and already diagnosed cardiac, pulmonary, thyroid and blood disorders or past history of cardiac surgery were excluded. Thorough history, physical examination and laboratory tests to exclude common causes of dyspnoea like blood Complete Picture, Thyroid function tests, x-ray chest, ECG and echocardiography were done. For each participant Echocardiography parameters including ejection fraction volume (EF), valvular function, pulmonary pressure and ventricular function were investigated to exclude structural cardiac disease and electrocardiogram was done to exclude rhythm disorders. Blood complete picture was done to grade Patients into severe anemia (hemoglobin concentration less than 7.0 g/dL), moderate (7.0-9.9 g/dL) and mild anemia (10.0 to 11.0 g/dL). Reference ranges for diagnosing thyroid disorders were first trimester, 0.1–2.5 mIU/Second trimester, 0.2–3.0 mIU/Land third trimester, 0.3–3.0 mIU/L. X-ray chest was done with abdominal shielding only if clinically indicated.

Data Analysis

Patients were followed every month till delivery or at development of deterioration of NYHA class or fetal or maternal complications. Demographic data including age, parity, Post-delivery data including period of gestation of pregnancy, type of delivery, and general condition were recorded and expressed as mean ± SD. Data analysis procedure including frequency and percentage were calculated. After data collection, the relation between dyspnea and mortality was evaluated.

RESULTS

A Total of 1200 obstetric patients were enrolled during the study period who had dyspnea ranging from NYHA>II. Over all incidence of dyspnea was 40% amongst all obstetric patients. In 35% patients no cause was found and 5% had an underlying cause for dyspnea as shown in fig-1. Mean age 28.5 ± 5 years, Parity 2 ± 1.4, Period of gestation (POG) at diagnosis was 29.5 ± 3.3 weeks, POG at delivery was 36 weeks ± 1.5 weeks, frequency of NYHA class 2,3,4 was 68%, 28% and 4% respectively. As shown in fig-2 most common cause of dyspnea was Anemia 1050 (87.5%), Cardiac disease 87 (7.2%), Pulmonary disease 35 (2.9%) Thyroid disease 8 (0.66%) and others 20 (1.66%) as shown in fig-2. Iron deficiency anemia was the cause in 998 (95%), 32 (3%) had thalassemia, 10 (1%) megaloblastic anemia and 10 (1%) had mixed picture. The etiology of maternal cardiac lesions was 96 (57%) acquired, 40 (23%), congenital 25 (15%), arrhythmias and 9 (5%) had cardio-myopathy. Of pulmonary diseases 28 (80%) were asthmatic, 4 (11.6%) infections including

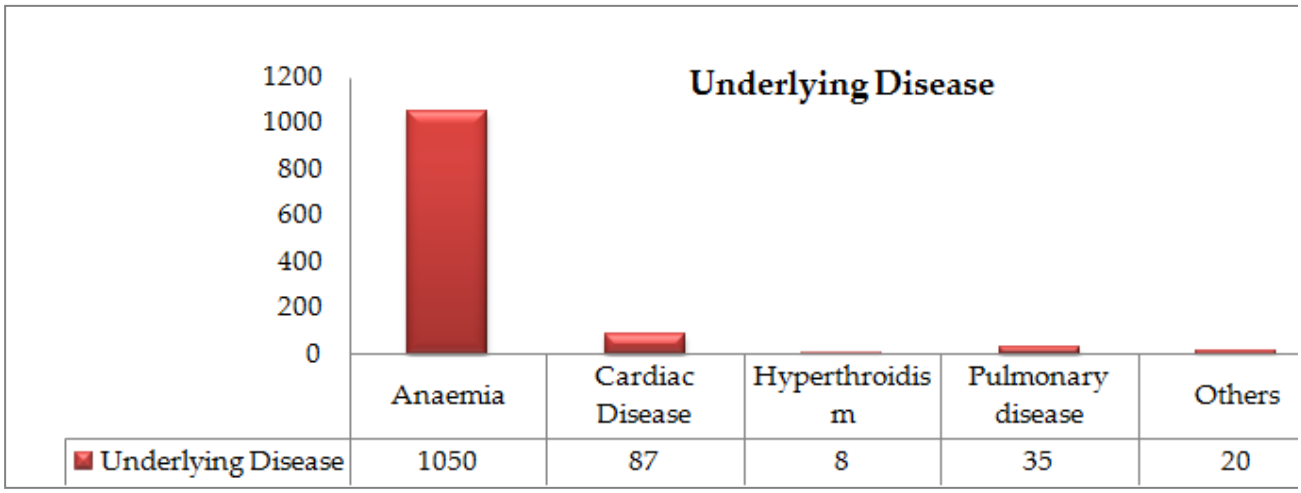

Figure-2: Major causes of dyspnea.

tuberculosis and pneumonia, 2 (5.7%) had pulmonary edema and 1 (2.8%) developed acute lung injury secondary to obstetric complications. Less common other causes of dyspnea were sepsis 18 (90%), amniotic fluid embolism 1 (5%) and ruptured gall bladder in 1 (5%) patient.

Mode of delivery was 37% LSCS, 52% vaginal delivery, 9.6% instrumental vaginal delivery and 1.4% assisted breech delivery. Mortality ratio was 220/100,000 live births. Out of mortalities 8% were due to cardiac disease compared to 0.3% due to anemia. All the mortalities were in patients who presented with grade 3 and 4 dyspnea.

DISCUSSION

Dyspnea or breathing discomfort may be a benign symptom of the pregnancy and can exist in the absence of cardiac and pulmonary conditions. Although common during pregnancy dyspnea is almost always limited to the awareness of breathing, rather than the uncomfortable awareness of the necessity for breathing. As in this study 35% patients had physiological dyspnea which is similar to another study by Sahasrabudhe TR[12]. It is important to consider the cause of dyspnea, however, because it can herald more severe conditions such as pulmonary edema, pulmonary embolism, pneumothorax, pneumonia, or worsening asthma. The pregnant patient also can suffer cardiac disease, or may have hematologic problems which can produce significant anemia and lead to dyspnea. Ultimately, however, any organic condition which can cause dyspnea in the non-pregnant patient could affect the pregnant patient.

In the study by Ruest et al, it was shown that dyspnea is a common finding even in normal pregnancies, while many cardiac and pulmonary diseases manifest with this symptom[13]. Weinberger et al stated that dyspnea in a pregnant woman brings up the question whether the patient has certain degrees of an underlying cardiac or pulmonary disease or if is an isolated symptom induced by pregnancy[14]. In total, 60-70% of pregnant women experience dyspnea during pregnancy[14], which is most common during the first and second trimesters as compared to this study in which dyspnea was in 35% patients only, as grade 1 dyspnea was excluded. In a study 85% of patients with dyspnea were due to asthma, pneumonia, cardiac ischemia, pulmonary disease, heart failure, obstructive airway disease and psychological problems[15] as compared to this study where anaemia was the leading csuse of dyspnea in 87.5% cases. Regarding the great importance of cardiac diseases and their related morbidity and mortality, mainly during pregnancy and due to unknown nature of many such diseases, the European Cardiac Society Guideline on cardiac disease in pregnancy recommended precise evaluation in pregnant women with dyspnea[16,17].

In this study population majority were anemic and a major contributor towards symptoms of breathing difficulty.in another study 90.5% ptients were anemic[18]. In Pakistan the prevalence of anemia among pregnant women living in urban areas was reported from 29% to 50%. Some studies have shown that the frequency of Iron deficiency anemia varies in the pregnant women of Karachi (64%), Lahore (73%) and Multan (76%)[19,20]. Grades of anemia in these patients were 75.0% mild anemia (hemoglobin from 9.0 to 10.9 g/dL) and 14.8% moderate anemia (hemoglobin from 7.0 to 8.9 g/dL). Only 0.7% were severely anemic (hemoglobin <7.0 g/dL). Pulmonary disease was responsible for dyspnea in 2.9% of patients which is similar to other studies[21]. The prevalence of hyperthyroidism in pregnancy is about 0.2% to 2.5%[10] as compared to this study which shows incidence of 0.66%. Other less common causes of dyspnea were responsible for 1.66% cases[22]. Out of mortalities 8% were due to cardiac disease compared to 0.3% due to anemia. Global Mortality ratio is 210/100,000 births. In developed world MMR is 14/100,000 and according to demographic survey of Pakistan mortality ratio is 176/100,000[23]. In this study Mortality ratio was 220/100,000 live births which

is high showing that dyspnea is a symptom not to be ignored. Out of mortalities 8% were due to cardiac disease compared to 0.3% due to anemia. Cardiac disease being the leading indirect cause of maternal mortality as shown by other studies[24].

Contribution of this study is highlighting the importance of dyspnea as an important symptom in pregnant patients which merits further investigations. Anemia is a public health problem in our country as shown by high incidence in this study but underlying cardiac disease is a major contributor towards maternal mortality and antenatal period is an excellent opportunity to identify and treat these causes for a better maternal and neonatal outcome.

Limitation was that study population was subjectively graded and investigated for limited causes.

CONCLUSION

Dyspnea should not be ignored as a normal symptom due to pregnancy changes. It could be the sole manifestation of underlying life threatening disease. Some diseases with a high prevalence like anemia can be identified and treated easily during antenatal period. Early recognition and evaluation can save many precious lives.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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