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Preeclampsia as a Screening Tool for Future Risk of Cardiovascular Disease

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Abstract

Cardiovascular disease poses a significant risk to the health of women. The American Heart Association (AHA) has recently classified preeclampsia as a major risk factor for cardiovascular disease. This new information allows an opportunity for expansion in screening methods. Obtaining a detailed pregnancy history to identify if an increased risk is present should be included during a comprehensive history. While there are many factors that can increase a women's risk for cardiovascular disease, identification of these risks before the development of overt disease allows an opportunity for correction of modifiable risk factors.

Keywords: Preeclampsia, Heart Disease, Cardiovascular Disease, Screening, Anticipatory Guidance

While preeclampsia is a pregnancy related syndrome, we now know that a history of preeclampsia can affect a women's health outside of pregnancy. The American Heart Association (AHA) in 2011 classified preeclampsia as a major risk factor for cardiovascular disease.[11] With new knowledge comes the challenges of implementation evidence into practice. In order to prevent death from cardiovascular disease, focus should be placed on screening that includes a detailed pregnancy history.

Education and preventive strategies have been successful in almost doubling womens' awareness of cardiovascular disease over the past 10 years,[13] providing evidence that strategies to promote womens' awareness of their risk for cardiovascular disease have worked. Along which increased awareness comes prevention and treatment of risk factors. Coronary heart disease (CHD) is the cause of roughly half of all deaths from heart disease in women.[11] The age-adjusted death rate from CHD decreased in 2007 to roughly 2/3 of what it was in 1980.[11] This decrease is attributed to decreasing major risk factors in women by utilizing primary prevention as well as treatment and early diagnosis by utilization of secondary prevention strategies.[11] These statistics show death rates from CHD dramatically decreased with the use of prevention and treatment strategies, which allow foresight on the potential effect expanding screening methods to include preeclampsia as a risk factor will have on the reduction of death from cardiovascular disease. Preeclampsia has been shown to be a major risk factor in the development of cardiovascular disease in women, therefore obtaining a pregnancy history during a screening process will allow a provider to adjust a plan of care appropriately in the effort to further decrease the death rate from cardiovascular disease in women.

Background

Preeclampsia is a syndrome in pregnancy after 20 weeks gestation which includes new onset hypertension of 140/90 mm Hg or higher accompanied by proteinuria greater than or equal to 0.3 g/24 hours or higher.[18] The incidence of preeclampsia ranges from 2-8% of pregnant women.[8] This incidence can increase up to three times based on racial, economic, social and geographic differences.[8]

Cardiovascular disease is the leading cause of death in women, resulting in 421,918 deaths in 2007, which is approximately 1 death per minute in the United States.[11] A history of preeclampsia puts a woman at twice the risk for cardiovascular disease within 5 to 15 years after pregnancy for stroke, cardiovascular disease and clotting in the veins.[11] While it is known that the major ways to prevent cardiovascular disease are to quit smoking, eat healthy and maintain an active lifestyle, 1 in every 4 deaths in the United States is due to cardiovascular disease.[5] Risk factors such as obesity and hypertension are rising among women in the United States.[11] It remains unknown to most women that a major risk factor for cardiovascular disease includes preeclampsia during pregnancy. Educating women who are diagnosed with preeclampsia or who have a pregnancy history of preeclampsia of their increased risk for cardiovascular disease allows the opportunity for informed lifestyle choices in prevention of cardiovascular disease in the future.

There is a lack of literature available that concludes the effect of educating women with a history of preeclampsia on their future risk for cardiovascular disease. It can be concluded that this lack of literature is in large part due to there being a lack in education taking place, as well as the recency of the AHA publication classifying preeclampsia as a risk factor for cardiovascular disease.[11] In the 2011 AHA publication guidelines for the prevention of

cardiovascular disease in women, an algorithm was developed to screen a woman for cardiovascular disease risk. It includes preeclampsia as a major risk factor and alone qualifies a woman at risk for cardiovascular disease.[11]

The guidelines established by the AHA were based on current research concluding the risk for cardiovascular disease is greater for those women who have been diagnosed with preeclampsia in pregnancy, therefore pregnancy history including preeclampsia should be including in standard screening for cardiovascular disease.[2,7,10,15-16]

Current Screening Practices for Cardiovascular Disease

It is accepted that early identification and treatment of risk factors has potential to decrease death rates from cardiovascular disease, emphasizing importance as cardiovascular disease remains the number one killer of women.[11] Although the literature shows the persistently high prevalence of cardiovascular disease in women, there is a significant lack of knowledge regarding cardiovascular disease with both women and healthcare providers.[12] Providers need proper training on screening for cardiovascular disease risk in women and practice standards need to be set for implementation of screening methods.

It has been shown that 52% of adults are not receiving annual preventive health care.[3] Of women with cardiovascular disease, 90% have at least 1 risk factor that could be reduced or prevented.[5] Proper care cannot be given to patients when they are only seen during periods of health concern. A person who feels healthy is still at risk of dying from cardiovascular disease as it has been shown that symptoms were not present in nearly 2/3 of women who die suddenly from coronary heart disease.[5] Education is essential so women are aware of their risks as well as to promote the importance of prevention of cardiovascular disease.

In 2005, the AHA performed a study to elevate physician awareness and adherence to cardiovascular disease prevention guidelines. While these guidelines have since been updated, the results provided evidence that fewer than 1 in 5 physicians acknowledged that more women than men die each year from cardiovascular disease.[12] Women are more likely to seek care from an obstetrician/gynecologist during younger and middle age, while obstetrician/gynecologists were the least likely of all the physician groups to incorporate screening for cardiovascular disease into their practice.[12] While all providers self reported low effectiveness in managing risk factors and preventing heart disease, obstetrician/gynecologists self report were the lowest.[12]

Screening Recommendations for Practice

Need for Early Screening Initiation

The average age of childbearing for a woman has increased through the generations, with the average age shown in 2009 to be 25 years.[4] Prevention of cardiovascular disease is directly correlated with the age of risk factor reduction; therefore risk identification for cardiovascular disease should be initiated as soon as possible.[1] By age 20, the AHA recommends screening for cardiovascular disease.[1] Since the average age of a childbearing woman is 25 years, it is appropriate that those who experience preeclampsia in pregnancy should be educated on their increased risk for cardiovascular disease immediately following diagnosis if at all possible. Educating women with a diagnosis of preeclampsia about the increased risk for cardiovascular disease allows the opportunity for those women to incorporate lifestyle changes that will decrease their already increased risk for cardiovascular disease later in life.

In order to identify those at risk who have been diagnosed with preeclampsia at the earliest possible age, a detailed pregnancy history should be obtained from women of all ages during screening for cardiovascular disease. This will allow those who have a pregnancy history

of preeclampsia to be exposed and allow for appropriate education, prevention strategies and risk modification.

Practice Recommendation

While the AHA has included a history of preeclampsia into the developed algorithm for screening in 2011,[11] there is a lack of publications regarding the application of the algorithm in clinical practice. Therefore it is reasonable to conclude that it has yet to be widely incorporated into practice. It is recommended for the standard of practice in caring for women to including cardiovascular disease screening that incorporates a detailed pregnancy history and education of all women with a current or previous diagnosis of preeclampsia on their increased risk for cardiovascular disease as well as strategies to decrease this risk, at the youngest possible age.[2,7,10,15-16]

The evidence states that depending on the risk factor, a decrease in developing cardiovascular disease from 5-24% can be obtained by modifying those risk factors.[9] There is a lack of evidence showing the effects of utilizing pregnancy history as a screening tool for cardiovascular disease, even though it has been well documented that conditions such as preeclampsia leave a woman with an increased risk for developing cardiovascular disease later in life. The recommendation for standard of practice to include identifying those with a pregnancy history of preeclampsia and educating them on their risk for cardiovascular disease as well as methods to decrease their risk will provide an opportunity for further research in evaluating whether screening and educating those with preeclampsia about their risk will decrease later development of cardiovascular disease.

Implications for this practice recommendation include educating all staff that educate patients on the available research, most importantly that those with a diagnosis of preeclampsia

are at a high risk for cardiovascular disease. Education strategies including both verbal and written information should be utilized in educating women on risk reduction and prevention.

Potential Barriers to Screening

Although there is a lack of research in regards to barriers of screening regarding women who have been diagnosed with preeclampsia and heart disease later in life, assumptions can be made as to possible barriers.

Lack of Knowledge

It can be assumed that the recency of the AHA publication, which classifies preeclampsia as a major risk factor for heart disease, provides a potential barrier to screening. There is an absence of research available discussing the effects of screening women with preeclampsia for heart disease, which might be concluded that this practice has yet to be widely accepted. While time will most likely decrease this barrier, other methods such as promotion and education of providers should be utilized as well.

Lack of Communication

During childbearing years, women are more likely to utilize an obstetrician/gynecologist who is likely the one to know their detailed pregnancy history.[12] In the period after childbearing years, a large proportion of women are no longer seeing the same provider.[12] Knowledge of pregnancy history, specifically complications, is not always detailed on medical records and therefore might not be known by the provider later in life when there is the greatest risk for heart disease. While it is important that screening and prevention methods are initiated immediately after the diagnosis of preeclampsia is made, many women are seen by a different provider later in life. This poses a potential barrier for a lack of communication between providers as well as a lack of communication between patient and provider of previous pregnancy history.

Lack of Preventative Health Care

Annual preventive health care is not accessed by 52% of adults.[3] This provides a barrier as screening and prevention is most likely to be done when someone is being seen for an annual exam verses an acute problem. It has been shown that 2/3 of women did not experience symptoms before a sudden death due to coronary heart disease.[5] Cardiovascular disease screening during family planning visits for low income women age 18-44 provides evidence that indicates 87% of women had chronic disease and/or risk factors for cardiovascular disease.[14] Chronic disease included hypertension, high cholesterol and diabetes, while risk factors include obesity, smoking and physical activity.[14] Risk factors and precursors for chronic disease were more prevalent than actual disease, which indicates that screening during reproductive age allows the opportunity for risk factors to be identified when there is still a chance to prevent disease. Risk identification will allow for implementation of education and prevention strategies, which is what is needed in the fight against cardiovascular disease in women.

Screening Promotion

The lack of research specifically addressing barriers for screening of heart disease in women with a pregnancy history of preeclampsia limits available evidence to support strategies for screening and prevention. As similar risks exist for the pregnancy-related condition of gestational diabetes and future risk of type II diabetes mellitus, strategies to promote screening for future diabetes risk will be considered. The risk of obtaining prediabetes, type II diabetes dellitus, and metabolic syndrome also increase over time after pregnancy.[17] It has been shown that women with gestational diabetes have a 16-30% risk of developing diabetes mellitus type II within 5 to 10 yrs postpartum. Therefore, it is recommended that women with a history of gestational diabetes be screened every 1 to 3 years.[17] The Diabetes Prevention Program

concluded that through risk reduction, specifically lifestyle changes of weight reduction and an active lifestyle, along with the use of metformin which is a medication to lower blood glucose, reduced a womens risk for type II diabetes mellitus by greater than 50% after being diagnosed with gestational diabetes.[6]

Unlike preeclampsia and the future risk for cardiovascular disease, there has been research that provides ways to overcome the barriers in screening for type II diabetes mellitus in women with gestational diabetes. Those recommendations include providing reminders to both physicians and patients when follow up for screening is needed, however there have also been studies that showed poor follow up even with the utilization of reminders.[17] Another study concluded that a dramatic increase was seen in follow up screening for type II diabetes mellitus after gestational diabetes with the initiation of a nurse managed care program.[17] This program allowed for greater attention to be specifically given to follow the guidelines in postpartum screening for diabetes and recommendations.[17]

Conclusion

With cardiovascular disease continuing to take the life of so many women each year it is more important than ever that we equip every woman with all of the knowledge and tools she needs to take control of her own health. Therefore, it is important for all healthcare professionals to incorporate best practice in expanding screening methods to identify future risk for heart disease after preeclampsia. With the recent classification as a major risk factor for cardiovascular disease by the AHA, changes in practice to including a detailed pregnancy history in screening must be established. Future research is needed to identify barriers of screening for heart disease in women with a pregnancy history of preeclampsia and prevention of those barriers.

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Appendix A

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