Journal of Pregnancy and Newborncare

Open Access Full Text Article

Editorial

Early Prediction of Preeclampsia

This article was published in the following Scient Open Access Journal:
Journal of Pregnancy and Newborncare
Received April 24, 2018 ; **Accepted** May 01, 2018; **Published** May 11, 2018

Mohamed Nabih EL-Gharib*

Professor of Obstetrics and Gynecology, Faculty of Medicine, Tanta University, Egypt

Preeclampsia is a common obstetric complication that causes both maternal and fetal morbidity and fatality rate [1]. It too increases the long-term risk of cardiovascular and cerebrovascular disease [2]. The incidence of preeclampsia is 3-5% [3]. Early detection of preeclampsia can reduce the severity of complications and better clinical outcomes [4,5].

The exact cause of preeclampsia is still unknown. The two stage theory and angiogenic imbalance are two notable postulates of the disease [6]. The first stage is impaired trophoblastic invasion into spiral arteries, which can result in a little linen and high can be evaluated by uterine artery Doppler assessment [7]. Many uterine artery Doppler studies have found that preeclamptic patients have more abnormal uterine artery Doppler results than normal patients [8,9].

Another model proposes angiogenic imbalance. The resistance. This model process of placental development, the coordination of vascular alterations, and the regulation of trophoblast growth are mediated by several locally acting angiogenic and antiangiogenic factors and their receptors [10]. When these processes are suboptimal, the results may be placental dysfunction, which can cause preeclampsia. This can be assessed by measuring angiogenic factors [11].

Angiogenic factors such as histidine-rich glycoprotein (HRG) is an angiogenic agent that can be detected throughout pregnancy, but lower serum HRG levels are observed in preeclampsia [12,13]. HRG affects the balance of angiogenesis and is associated with preeclampsia [14-16]. The mechanism is the binding between HRG and anti-angiogenic thrombospondin (TSP1). The binding between HRG and TSP-1 can inhibit the interaction between TSP-1 and CD36. HRG also has effects on fibrinogen and platelet levels, and coagulation, which may affect preeclampsia [13,17,18].

Although, circulating levels of angiogenic factors are proposed to be useful for prediction of preeclampsia, [19] as changes in the layers of these biomarkers are discovered long before the clinical manifestations of preeclampsia, and their systemic concentrations may act as marks of disease severity [20]. In spite of this, the combination of uterine artery Doppler and serum angiogenic factor level at 11-13 weeks of gestation was not effective as a first-trimester screening for the prediction of preeclampsia [21]. Thus, we are still awaiting for an effective early predictor for preeclampsia during the first trimester.

References

1. Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. *Lancet.* 2006;367(9516):1066-1074.
2. Bellamy L, Casas JP, Hingorani AD, Williams DJ. Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis. *BMJ.* 2007;335:974.
3. Mol BW, Roberts CT, Thangaratinam S, Magee LA, de Groot CJ, Hofmeyr GJ. Pre-eclampsia. *Lancet.* 2016;387:999-1011.
4. Duckitt K, Harrington D. Risk factors for pre-eclampsia at antenatal booking: systematic review of controlled studies. *BMJ.* 2005;330:565.
5. Henderson JT, Whitlock EP, O'Connor E, Senger CA, Thompson JH, Rowland MG. Low-dose aspirin for prevention of morbidity and mortality from preeclampsia: a systematic evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2014;160(10):695-703.
6. Roberts JM, Hubel CA. The two stage model of preeclampsia: variations on the theme. *Placenta.* 2009;30:32-37.

***Corresponding author:** Mohamed Nabih EL-Gharib, Professor of Obstetrics and Gynecology, Faculty of Medicine, Tanta University, Egypt, Tel: +201006023260, Email: mohgharib2@hotmail.com

7. Phupong V, Dejthevaporn T, Tanawattanacharoen S, et al. Predicting the risk of preeclampsia and small for gestational age infants by uterine artery Doppler in low-risk women. *Arch Gynecol Obstet.* 2003;268(3):158-161.

8. Tannirandorn Y, Charoenvidhya D. Predicting the risk of preeclampsia and small for gestational age infants by uterine artery Doppler in low-risk women. *Arch Gynecol Obstet.* 2003;268:158–61.

9. Phupong V, Dejthevaporn T. Predicting risks of preeclampsia and small for gestational age infant by uterine artery Doppler. *Hypertens Pregnancy.* 2008;27:387-395.

10. Sritippayawan S, Phupong V. Risk assessment of preeclampsia in advanced maternal age by uterine arteries Doppler at 17-21 weeks of gestation. *J Med Assoc Thai.* 2007;90:1281-1286.

11. Kaufmann P, Mayhew TM, Charnock-Jones DS. Aspects of human fetoplacental vasculogenesis and angiogenesis. II. Changes during normal pregnancy. *Placenta.* 2004;25:114-126.

12. Molvarec A, Fugedi G, Szabo E, etal. Decreased circulating anandamide levels in preeclampsia. *Hypertens Res.* 2015;38(6):413-418.

13. Nordqvist S, Karehed K, Skoog Svanberg A, Menezes J, Akerud H. Ovarian response is affected by a specific histidine-rich glycoprotein polymorphism: a preliminary study. *Reprod Biomed Online.* 2015;30(1):74-81.

14. Poon IK, Patel KK, Davis DS, Parish CR, Hulett MD. Histidinerich glycoprotein: the Swiss Army knife of mammalian plasma. *Blood.* 2011;117(7):2093-2101.

15. Bolin M, Akerud P, Hansson A, Akerud H. Histidine-rich glycoprotein as an early biomarker of preeclampsia. *Am J Hypertens.* 2011;24(4):496-501.

16. Bolin M, Wikstrom AK, Wiberg-Itzel E, et al. Prediction of preeclampsia by combining serum histidine-rich glycoprotein and uterine artery Doppler. *Am J Hypertens.* 2012;25(12):1305-1310.

17. Karehed K, Wikstrom AK, Olsson AK, Larsson A, Olovsson M, Akerud H. Fibrinogen and histidine-rich glycoprotein in earlyonset preeclampsia. *Acta Obstet Gynecol Scand.* 2010;89(1):131-139.

18. Jones AL, Hulett MD, Parish CR. Histidine-rich glycoprotein: a novel adaptor protein in plasma that modulates the immune, vascular and coagulation systems. *Immunol Cell Biol.* 2005;83(2):106-118.

19. O'Gorman N, Wright D, Poon LC, et al. Accuracy Of Competing-Risks Model in Screening For Preeclampsia By Maternal Factors and Biomarkers at 11-13 Weeks' Gestation. *Ultrasound Obstet Gynecol.* 2017;49(6):751-755.

20. Kenny LC, Black MA, Poston L, et al. Early pregnancy prediction of preeclampsia in nulliparous women, combining clinical risk and biomarkers The Screening for Pregnancy Endpoints (SCOPE) international cohort study. *Hypertension.* 2014;64(3):644-652.

21. Aksornphusitaphong A, Phupong V. Combination of serum histidine-rich glycoprotein and uterine artery Doppler to predict preeclampsia. *Hypertension Research.* 2018; 41(4):275-281.