

## HOMOCYSTEINEMIA IN TOXAEMIA AN INDICATOR OF PREGNANCY OUTCOME

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Pre-eclampsia / eclampsia is the most common serious medical disorder of human pregnancy complicating about 5-10% of all pregnancy<sup>1,2,3</sup>. If pre-clampsia is not diagnosed or treated, it can progress to maternal multiorgan failure, coagulopathy with maternal and fetal death in its severe form<sup>4,5</sup>.

Homocysteine is a sulphur containing essential amino acid primarily derived from demethylation of dietary methionine which is abundant in animal protein, required for growth of cells and tissues in the human body<sup>6</sup>. Elevated circulating homocysteine is a risk factor for endothelial dysfunction and vascular disease such as atherosclerosis and occlusive vascular disease. The vascular effects of homocysteinemia have been proposed to include endothelial cell injury and thrombus formation<sup>7</sup>. The pathophysiology is explained as auto-oxidation of homocysteine to produce reactive oxygen species (ROS) which inactivate nitric oxide and thrombomodulin<sup>8</sup>.

Patho-physiologic process of pre-eclampsia is poorly understood, but currently endothelial dysfunction is most popularly hypothesized to be a central pathophysiological feature of pre-eclampsia, leading to altered vascular reactivity, loss of vascular integrity and activation of coagulation cascade<sup>9</sup>. It has been also proposed that hyperhomocysteinemia may be associated with pre-eclampsia as the homocysteine mediated vascular changes are similar to those associated with pre-eclampsia<sup>10,11</sup>. It is observed that levels of maternal serum homocysteine normally decrease with gestation, either due to a physiological response to the pregnancy, increase in estrogen, haemodilution from increased plasma volume, or increased demand for methionine by both the mother and foetus<sup>12</sup>.

Relationship of homocysteinemia with pre-eclampsia/eclampsia was studied well and large bodies of evidences suggest homocysteinemia to be a probable causal factor.

"Association of serum homocysteine and serum lipid with eclampsia" by Mahal M et al in this issue of JAFMC is a valuable work in the field especially in our country. In this study they found that elevated homocysteine & reduced HDL cholesterol level were associated with

eclampsia. Many other studies have shown similar relationship with elevated homocysteine and toxemia of pregnancy<sup>10-13</sup>.

In a densely populated country like Bangladesh where maternal mortality rate is 3.15 per 1000 women and about 16% of such death is associated with pre-eclampsia/eclampsia<sup>14</sup>, intervention for safe pregnancy outcome is time demanding. For this reason study about homocysteine should get more attention in our research.

### References

1. Roberts JM, Redman CWG. Pre-eclampsia: More than pregnancy induced hypertension. *Lancet* 1993; 341: 1447-51.
2. Witlin AG, Sibai BM. Magnesium sulfate therapy in pre-eclampsia and eclampsia. *Obstet Gynecol* 1998; 92: 883-89.
3. American College of Obstetricians and Gynecologists (ACOG). Diagnosis and management of pre-eclampsia and eclampsia. *Obstet Gynecol* 2002; 99: 159-167.
4. Friedman SA, Taylor RN, Roberts JM. Pathophysiology of pre-eclampsia. *Clin Perinat* 1991; 18: 661-682.
5. Barron W M. The syndrome of pre-eclampsia. *Gastroenterol Clin North Am* 1992; 21: 851-872.
6. Refsum H, Ueland PM, Nygard O, Vollset SE. Homocysteine and cardiovascular disease. *Ann Rev Med*. 1998; 49: 31-62.
7. Welch GN, Loscalzo J. Homocysteine and atherothrombosis. *N Engl J Med* 1998; 338: 1042-1050.
8. Sydow K, Schwedhelm E, Arakawa N, et al. ADMA and oxidative stress are responsible for endothelial dysfunction in hyperhomocysteinemia: Effects of L-arginine and B vitamins. *Cardiovasc Res* 2003; 57: 244-58.
9. Roberts J, Taylor R, Musci T, Rodgers G, Hubel C, McLaughlin M. Preeclampsia: An endothelial cell disorder. *Am J Obstet Gynecol* 1989; 161:1200-04.
10. Rajkovic A, Catalano PM, Malinow MR. Elevated homocysteine level with pre-eclampsia. *Obstet Gynecol* 1997; 90: 168-71.
11. Zeeman GG, Alexander JM, McIntire DD, Devaraj S, Leveno KJ. Homocysteine plasma concentration levels for the prediction of pre-eclampsia in women with chronic hypertension. *Am J Obstet Gynecol* 2003; 189: 574-76.
12. Walker MC, Smith GN, Perkins SL, Keely EJ, Garner PR. Changes in homocysteine levels during normal pregnancy. *Am J Obstet Gynecol* 1999; 180: 660-664.
13. Ingec M, Borekci B, Kadanali S. Elevated plasma homocysteine concentration in severe pre-eclampsia and eclampsia. *Tohoku Journal of Experimental Medicine* 2005; 206(3): 225-231.
14. Bangladesh Bureau of statistics. National census 2002. Ministry of Planning : Dhaka; 2004.

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