Assessment of Carotid Intima-Media Thickness and Infra-Renal Abdominal Aorta Diameter in Women with and Without Gestational Diabetes Mellitus-A case Control Study

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Introduction

Gestational diabetes mellitus (GDM) is a subtype of diabetes mellitus which occurred during pregnancy {Ku, 2011 #1}. GDM is carbohydrate intolerance with incidence rate approximately 1-14%. Woman with GDM are prone to type2 diabetes mellitus hypertension, dyslipidemia, metabolic syndrome and cardiovascular disease.
Carotid intima-media thickness (CIMT) is a maker of subclinical atherosclerosis. 

Associated between increased CIMT and type2 diabetes mellitus and cardiovascular disease is approved. Ultrasonographic CIMT is non-invasive and not expensive test for assessment sub clinical atherosclerosis. 

GDM is a predictor of cardiovascular atherosclerosis. Some studies suggest relationship between abdominal aorta aneurysm and atherosclerosis. Although it may be confounded by other atherosclerotic risk factors. 

Across-sectional study revealed no significant correlative between carotid plaque and infra-renal abdominal aorta diameter less than 27mm but diameter more than 27mm was associated with increased Carotid plaque burden and coronary atherosclerosis. 

The aim of this study is assessment of relationship between CIMT and infra-renal abdominal aorta diameter with GDM.

Materials and Methods

The study was conducted in department of radiology of Shahid Sadoghi hospital 2012 to 2013.Current case-control study included 40 participant. Including criteria were: women 20-40 years old with at least 6 months after pregnancy were enrolled 20 participants with GDM in last pregnancy and 20 participants without history of GDM. The exclusion criteria were diabetes mellitus, hyperlipidemia, hypotension, familial history of coronary artery disease, chronic disease (Hepatic, liver or history of cancer), FBS>126, smoking and BMI>35.GDM is defined as American diabetes association (ADA criteria).

Laboratory measurements

Fasting blood glucose, triglyceride, total cholesterol, low density lipoprotein cholesterol and high density lipoprotein cholesterol and high density lipoprotein were measured in same day which ultrasonography examination was done.

Ultrasoundography

Carotid intima-media thickness and infra abdominal aorta diameter were assessment by a Bi-mode ultrasound (simens G40) scanner with linear high frequency transducer (7.5 MHZ). CIMT examination was done in supine position according the American echocardiography recommendation. Three segment were selected; proximal internal carotid 1cm lower the flow driver, 1cm upper the follow driver as bifurcation and 2cm or more in common carotid above the flow driver and measurements was done bilaterally. At the end CIMT was considered as average of the mean CIMT of the 3left and 3 right segments. For assessment of infera-renal abdominal aorta minimum and maximal transverse as well as anterior-posterior diameters were measured in supine position. The ultrasonography study was done by an expert radiologist blinded to the clinical data.

Results

The clinical characteristics, Laboratory test findings of the study groups were reveled in table 1. Mean participant age BMI, systolic blood pressure, diastolic blood pressure, TG, cholesterol, LDL and HDL are not shown significant statistically difference.FBS between tow group reveal significant statistically difference ($P$-value <0.05). In comparison with control group GDM group revealed no significant difference in mean CIMT and infra-renal abdominal aorta diameter. Control group had a lower infera-renal abdominal aorta than the GDM group significantly also Pearson correlation analysis shows association between infera-renal abdominal aorta diameter and cholesterol and
LDL in non GDM participate but other factors (HDL, TG, FBS) is not associated with IAAD.

**Discussion**

Pregnancy is related to increase insulin resistance. GDM patients are prone to type 2 diabetes mellitus that leads to coronary artherosclerosis. (Sullivan, 2012 #20) Although most of the studies reveal association between ITM and GDM (Akinci, 2014 #21; Atay, 2014 #22; Bo, 2007 #23; Caliskan, 2014 #24; Freire, 2012 #26; Gunderson, 2012 #27), in current study no significant difference was detected Corresponding to the results of Yun Hyiki (1) study which may be resulting from study in Asian population compared to the western study. Obesity is a major factor affecting CIMT. Although BMI in current study is not significantly difference between two groups Women with lower BMI in control group had lower infera-renal abdominal aorta diameter. Also criteria used for diagnosis GDM may affected the influence of GDM on CIMT. (27,28)

The infera-renal abdominal aorta diameter is associated with cholesterol an LDL in non GDM participant. The major limitation of this study was not enough sample size.

**Conclusion**

Our study suggested GDM may not relate to CIMT and infera-renal abdominal aorta diameter. Also current study revealed Women with history of GDM are prone to having impaired fasting glucose.

**References**

5. Maple-Brown L, Hodge A, Cunningham J, Celermajer D, O'Dea K. Risk factors for cardiovascular disease do not fully explain...


