Correlation between vitreous advanced glycation end products, and d-dimer with blood hba1c levels in proliferative diabetic retinopathy /Tony Loho, Venna, Rahajuningsih D. Setiabudi, ninik Sukartini, Suzanna Immanuel, July Kumalawati, Andi A. Victor, Sarwini Waspadji

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ABSTRACT
BACKGROUND:proliferative diabetic retinopathy (DR) is an advanced form of DR that eventually could lead to blindness. Levels of vitreous advanced glycation end products (AGEs) and D-dimer may reflect the pathological changes in the retina, but only few studies have assessed their correlation with blood hemoglobin A1C (HbA1c) levels. This study aimed to find the association between blood HbA1c levels with vitreous AGEs and D-dimer levels in patients with proliferative DR. METHODS:an analytical cross-sectional study was performed in subjects with proliferative DR who underwent vitrectomy. Subjects were divided into 2 subgroups, i.e. uncontrolled (HbA1c >7%) and controlled (HbA1c <7%) groups. Vitreous AGEs and D-dimer levels were assessed; the levels were compared between uncontrolled and controlled hyperglycemic patients. Statistic correlation tests were also performed for evaluating blood HbA1c, vitreous AGEs, and D-dimer levels.RESULTS:a total of 47 patients were enrolled in this study and 32 (68.1%) of them were women. Median vitreous AGEs level was 11.0 (3.0 - 48.0) µg/mL; whereas median vitreous D-dimers level was 5,446.0 (44.0 - 37,394.0) ng/mL. The median vitreous AGEs levels was significantly higher in patients with uncontrolled vs. controlled hyperglycemia (14.0 vs. 4.0 mg/mL; p<0.001). There was a significant positive correlation with moderate strength between blood HbA1c level and vitreous AGEs level (r=0.524; r2=0.130; p=0.0001). Blood HbA1c level could be used to predict vitreous AGEs level by using the following calculation: vitreous AGEs = -1.442+ (1.740xblood HbA1c). Vitreous D-dimer levels were not significantly different between uncontrolled and controlled hyperglycemia (median 4607.5 vs. 5701.6 ng/mL; p = 0.458). There was a positive significant correlation between blood HbA1c and vitreous D-dimer levels (r = 0.342; p = 0.019); however the correlation was weak. Vitreous AGEs level had a positive significant correlation with vitreous D-dimer levels (r = 0.292; p = 0.046) and the correlation strength was also weak.CONCLUSION:median vitreous AGEs levels were significantly higher in proliferative DR patients with uncontrolled than those with controlled hyperglycemia. Blood HbA1c level can be used to assess vitreous AGEs level in patients with proliferative DR by using the following calculation: vitreous AGEs = -1.442+(1.740 x HbA1c). However, the blood HbA1c level can not be used to predict vitreous D-dimer level in patients with proliferative DR.