ABSTRACT

Diabetic retinopathy is one of the leading causes of blindness in diabetic patients. Abnormal angiogenesis in the retina has been implicated as the primary cause of its pathogenesis. Hyperglycemia induced oxidative stress leading to a damage to the capillary network of the retina has been revealed by several researchers. With this background, we hypothesised that, an evaluation of these factors could aid in the screening and management of diabetic patients under higher risk of developing diabetic retinopathy in the future. Similarly, comparison of these factors before and after the LASER and anti-VEGF therapy could help in predicting therapeutic outcome. To achieve this, we have compared plasma levels of vascular endothelial growth factor-A (VEGF-A), hypoxia inducible factor-1α, matrix metalloproteinase-9, pigment epithelial derived factor, phosphodiesterase, Nitric oxide (NO), soluble receptors for advanced glycated end products, malondialdehyde and protein thiols among normal (n=148), diabetic without retinopathy (n=148), non-proliferative diabetic retinopathy (NPDR) (n=148) and proliferative diabetic retinopathy (PDR) (n=74) subjects. The same parameters were also estimated a month after the LASER and anti-VEGF therapy. A statistically significant increase in the plasma levels of pro-angiogenic factors and markers of oxidative stress were observed in both NPDR and PDR groups. In contrast, the levels of anti-angiogenic factors and antioxidants were decreased significantly in those groups. Similar picture was also observed in patients following anti-VEGF therapy. However, LASER therapy did not show any change in the plasma levels of pro-angiogenic or anti-angiogenic factors except for VEGF-A and NO which were significantly reduced. The results of the study indicated that, evaluation of plasma pro- and anti-angiogenic factors and markers of oxidative stress may predict the risk of diabetic retinopathy. The hypoxia and increased oxidative stress persisted even after anti-VEGF therapy, which may adversely impact the recovery of diabetic retinopathy.