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Anemia and its determinants among type 2 diabetes mellitus: Bangladesh perspective

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Anemia is a common finding in patients with diabetes due to the presence of multiple factors like nutritional deficiencies, inflammation, concomitant autoimmune diseases, drugs and kidney diseases. The aim of the study was to determine the prevalence of anemia among patients with type 2 diabetes and the factors associated with anemia. Under a cross-sectional design a total of 217 type-2 diabetic patients were purposively selected from the outpatient department of a tertiary hospital in Bangladesh. All participants were screened for anemia using an auto-analyzer and hemoglobin was determined by spectrophotometric method. Along with descriptive and inferential statistics, multiple logistic regressions were performed to quantify the individual effect of predictor variables. The mean (SD) age of the participants was 53 years. Anemia was detected in 128 (59%) participants but the proportion varies significantly between males and females (53% vs. 68%; $p< 0.05$). Serum creatinine level was significantly higher in anemic participants than in those without anemia (1.2±0.4mg/dl vs. 1.0±0.1 mg/dl; $p< 0.05$). Significant negative correlation of hemoglobin with serum creatinine ($p<0.05$) and age ($p<0.05$) was found. The daily dietary intake of protein and iron of anemic group was significantly lower than the non-anemic group ($p<0.05$). Serum creatinine level ($p< 0.02$) and dietary intake of iron was positively ($p=0.05$) associated with anemia after adjusting the effects of other independent variables. The study indicate an alarmingly situation of anemia in type 2 diabetic patients, particularly among women in Bangladesh. Renal involvement seems to be an important determinant for anemia in Type 2 diabetics.

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Role of lifestyle factors in the attenuation of Alzheimer's disease in subjects sharing genetic etiology underlying type 2 diabetes and Alzheimer's disease

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Epidemiological evidence supports the observation that subjects with type 2 diabetes (T2D) are at higher risk to develop Alzheimer's disease (AD). However, how these conditions are causally linked and how dietary lifestyles interact with these conditions are unknown. Possible mechanisms include shared genetic risk factors, which we investigated in a recent study based on recent genome wide association study (GWAS) findings. We retrieved single nucleotide polymorphisms (SNPs) associated with T2D and AD from large-scale GWAS meta-analysis consortia and tested for overlap among the T2D and AD associated SNPs. We found 927 SNPs associated with both AD and T2D with p-value ≤0.01, an overlap significantly larger than random chance (overlapping p-value of 6.93E−28). Among these, 395 of the shared GWAS SNPs have the same risk allele for AD and T2D, suggesting common pathogenic mechanisms underlying the development of both AD and T2D. We found that gene annotations from these shared SNPs are significantly enriched for specific KEGG pathways pertaining to immune responses, cell signaling and neuronal plasticity, cellular processes in which abnormalities are known to contribute to both T2D and AD pathogenesis. This suggests that among T2D subjects with common genetic predispositions, dysregulation of these pathogenic pathways could have contributed to the onset of T2D, while simultaneously contributing to the increased risks of these subjects to eventually develop AD. Collectively, our GWAS studies tentatively support the epidemiological observation of disease concordance between T2D and AD. Ongoing studies are investigating whether intensive lifestyle intervention, including exercise and pharmacological treatment, in T2D subjects with genetic predisposition to AD may concurrently reduce T2D phenotypes and attenuate AD onset and progression.

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