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Antioxidant Status, Lipid Peroxidation Products and Cystatin C as Potential Clinical Markers of Alzheimer's Disease in Systemic Circulation

Ayşegül AKBAY[1]
Çiğdem AYDEMİR[2]
Selda DEMİRTAŞ[3]
Engin TURAN-TUNCER[4]
Orhan CANBOLAT[1]
Yasemin GENÇ[5]
Departments of Biochemistry[1], Central Laboratory[3], Psychiatry[4], Biostatistics[5], Faculty of Medicine, Ankara University, 2[D]epartment of Psychiatry, Ankara Numune Hospital, Ankara - TURKEY

Abstract: Growing data suggest oxidative stress contributes to the pathogenesis of Alzheimer's disease (AD). The objective of this study was to assess the value of antioxidant potential (AOP), antioxidant status (AOS) and thiobarbituric acid reactive substances (TBARS) and the cysteine protease inhibitor Cystatin C that plays a role in the processing of amyloid as clinical markers of AD in peripheral circulation and to find out the agreement limits of AOP and AOS as clinical laboratory tests. To do this, 21 severely demented patients fitting the DSM-IV diagnostic criteria for Alzheimer's type dementia as well as through minimental state examination were compared to 20 age-matching healthy controls with respect to their serum AOP, AOS, Cystatin C and TBARS levels. The under-curve area detected from ROC curves for TBARS, AOS, AOP and Cystatin C were 0.801, 0.622, 0.475 and 0.65 respectively. Altman and Bland analysis showed that the values obtained by the AOP assay were 0.0149-0.04664 with a mean of 0.03081 units higher than those values obtained via AOS assay, indicating a low level of agreement. In addition, Pearson's correlation testing showed a significant negative correlation between AOP and AOS ($r=0.479$, $p<0.01$). As a conclusion, among the tests investigated in this study, TBARS may be used as a dependable peripheral marker of AD with a sensitivity of 0.85 and a specificity of 0.6 at the cut-off point of 0.77 nmol/ml. AOS should be preferred to AOP as a marker with a specificity and sensitivity of 0.7 at the cut-off point of 0.011nmol/ml. Further studies may be undertaken to reveal the pathogenetic relation of oxidant stress and the processing of amyloid β.

Key Words: Alzheimer's disease, serum oxidative stress marker, Cystatin C

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