In vitro effects of resveratrol supplementation of plasma from patients affected by Alzheimer's Disease on cultured human endothelial cells

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An increasing body of evidence suggests that Alzheimer's disease (AD) is associated with an endothelial dysfunction. Given the absence of absolute cure for AD, the aim of the present study was to evaluate the effects of a short incubation with plasma from AD patients on cultured human aortic endothelial cells (HAECs) and to repeat the determinations following the supplementation of plasma with resveratrol (RSV). In particular, nitric oxide (NO) and peroxynitrite production, superoxide dismutase (SOD) and Na+/K+-ATPase activities, membrane fluidity and thiobarbituric acid-reactive substances (TBARS) levels were analyzed. Our results show a decrease in NO levels, enzymatic activities and membrane fluidity and an enhanced peroxynitrite and TBARS production in HAECs exposed to AD plasma, compared to cells incubated with plasma from healthy subjects. The exposure to RSV supplemented plasma, conversely, lowers ROS levels and stimulates the activity of the antioxidant enzyme SOD. Furthermore, resveratrol may improve the endothelial function by in-creasing membrane fluidity and Na+,K+-ATPase activity, and ameliorate cerebral perfusion through an enhanced NO formation and bioavailability. In conclusion, our study suggests the use of AD therapies based on dietary natural compounds able to reduce oxidative stress and prevent or reverse vascular endothelium dysfunction.