

VASCULAR DEGENERATION IN PARKINSON'S DISEASE

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We have previously reported endothelial cell degeneration in Parkinson's disease (PD) brain. The current study examined the changes of the function of the blood brain barrier (BBB), potential impairment of vascular remodelling and their association with vascular and neuronal degeneration in PD. The present study used the grey matter of middle frontal gyrus from post-mortem human PD brain and age-matched control cases where there was a significant neuronal degeneration in PD. Immunohistochemical staining of collagen IV for basement membrane (BM), platelet-derived growth factor receptor-beta (PDGF β R) for pericytes, NeuN for neurons, proliferating cell nuclear antigen (PCNA) for proliferation of endothelial cells, vascular endothelial growth factor (VEGF), fibrinogen for BBB function and phosphorylated insulin-like growth factor 1 receptor (IGF1Rp) were observed and quantified. Compared to controls, the BM was remained in PD leading to an increase in string vessels and there was no PD associated leakage of BBB. VEGF-positive neurons and pericyte-positive capillaries in PD were reduced with significant loss of vascular PCNA-positive cells. The trend toward reduction in vascular IGF1Rp-positive cells in PD was correlated with the decrease of vascular PCNA-positive cells. In conclusion, increased string vessel formation and maintained BBB may suggest the role for hypoperfusion in disease progress of PD rather than the BBB dysfunction associated neurodegeneration. The endothelial cell degeneration may be associated with impaired vascular remodelling due to the loss of trophic support from growth factors.