"BRAIN CIRCULATION AND METABOLISM IN VIVO IN MAN".*

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Studies of brain circulation and metabolism revealed no significant differences in cerebral blood flow (CBF) and cerebral oxygen consumption ($CMRO_2$) between a group of normal young subjects (of mean age 21 years) and a group of highly selected normal elderly men (of mean age 70 years) who were free of any detectable signs of physical or mental disorder. In a similar group of elderly men differing from the previous one only in the presence of mild asymptomatic vascular disease, there was a statistically significant decline in CBF (of 10-16%), but the $CMRO_2$ had not fallen to statistically significant levels. All of the reductions in CBF and $CMRO_2$ in this second group, could be accounted for by the results obtained in the arteriosclerotic subjects. Hypertensives without arteriosclerosis were normal as regards these functions.

In the normal aged men, although there was no reduction in $CMRO_2$ there was a considerable and statistically significant fall in cerebral glucose utilization (CMRG), an observation of debatable pathogenesis.

In patients with chronic brain syndrome and senile psychosis, the $CMRO_2$ had fallen significantly as compared to the asymptomatic arteriosclerotics. Arteriosclerosis appeared to be characterised by an increase in the cerebral arterio--venous oxygen difference, and a concurrent fall in the cerebral venous oxygen tension, suggesting cerebral circulatory insufficiency and anoxia.

It was concluded that decreases in CBF and $CMRO_2$ did not appear to be consequences of chronological aging *per se*, but rather of arteriosclerosis, which causes first a cerebral circulatory insufficiency and anoxia, and then a secondary reduction in cerebral metabolic rate.

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*The results reported here were obtained at the laboratory of Clinical Science of the National Institute of Mental Health, Bethesda, Md., U. S. A. in collaboration with Mark H. LaneDouglas B. Hansen, Seymour S. Kety, Robert N. Butler, Seymour Perten and Louis Sokoloff.