Malaria and the Nervous System: Cerebral Haemodynamics and Metabolism in Patients with Malaria and Central Nervous System Symptoms: The Response of the Diseased Cerebrovascular Systems to 5% Carbon Dioxide Inhalation and Hyperventilation

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OBJECTIVE: The objectives of this study are to investigate the physiologic factors which influence the cerebral blood flow and metabolism with emphasis on techniques for experimentally increasing blood flow; to evaluate the possibility of modifying those factors which are said to cause brain dysfunction in "C.N.S. malaria."

DESCRIPTION: See previous Annual Report.

PROGRESS: In our previous report, it was concluded that the administration of 5% carbon dioxide and acetazolamide in combination had an additive effect in increasing the cerebral blood flow in patients with occlusive cerebro–vascular disease. In practically all those patients, there was predominant clinical and angiographic involvement of the carotid arterial system.

During the period under report, sixteen patients with lesions in various parts of the central nervous system due to vascular and nonvascular disorders were studied. These included one patient each with Parkinson's Disease, hepato–cerebral degeneration, uremia, motor neuron disease, multiple sclerosis, malignant hypertension, two patients with Takayasu's arteritis, three patients with internal carotid artery occlusion, three patients with middle cerebral artery occlusion and two patients with upper brain stem lesion. Cerebral haemodynamics were determined before and after 5% carbon dioxide inhalation.

It was found that in all except the two patients with upper brain stem lesions, carbon dioxide produced a significant increase in cerebral blood flow. Those two patients and six others with decerebrate rigidity previously studied (see previous Annual Report), who failed to respond to carbon dioxide, seemed to substantiate the recent hypothesis based on animal study that the upper brain stem played an important role in the regulation of cerebral blood flow.

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