

Assessment of the Functional Effect of the Intracarotid Sodium Amobarbital Procedure Using Co-registered MRI/HMPAO-SPECT and SEEG

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We studied the functional effect of injection of sodium amobarbital (SA) in 10 patients with intractable epilepsy. During the intracarotid amobarbital procedure, we measured delta activity in EEG recordings from implanted electrodes and regional cerebral blood flow (rCBF) using HMPAO-SPECT co-registered with MRI. SA injection resulted in an increase in delta activity and a decrease in rCBF in all areas examined. Direct functional changes were observed in structures perfused by the carotid artery injected. In addition, we observed indirect effects, probably owing to deafferentation of neuronal pathways connecting these structures to ipsilateral and contralateral regions, including middle and posterior hippocampus. © 1997 Academic Press

INTRODUCTION

The intracarotid sodium amobarbital procedure (IAP) has been used in the clinical evaluation of patients with epilepsy for over three decades. The procedure consists of injection of sodium amobarbital (SA) into the internal carotid artery (ICA), leading to transient anaesthesia of the injected hemisphere, whereby the language and memory abilities of the contralateral side can be assessed (Wada, 1949; Wada and Rasmussen, 1960; Milner, Branch & Rasmussen et al., 1962; Jones-Gotman, 1987). Human and monkey studies of amnesia have highlighted the medial temporal-lobe structures, and spe-

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