29.8

BLOOD FLOW AND OXIDATIVE METABOLISM OF THE BRAIN IN THE COURSE OF ACUTE SCHIZOPHRENIA

S.Hoyer and K.Oesterreich, University of Heidelberg (FRG).

In patients with a productive type of schizophrenia, i.e. in the acute state of schizophrenic psychosis with hallucinations, sensations of apprehension, catatonic excitation and catatonic stupor, it could recently be shown that there are significantly elevated values of brain blood flow and metabolism as compared to patients with paranoia or chronic states of schizophrenia. Values were also raised in comparison with normals (1; 2).

It was decided to investigate how blood flow (Kety-Schmidt technique) and the metabolic rates of oxygen, glucose and lactate of the brain change during the course of productive and paranoid schizophrenias. Measurements of these biological parameters of the brain were performed in the acute phase of the productive schizophrenic episode and on average 32 days later under treatment mainly with phenothiazines in 11 patients. In seven patients with paranoia or schizophrenia simplex the measurements could be repeated on average 38 days later also under treatment with phenothiazines.

In patients with productive schizophrenia CBF decreased significantly ($p \leq 0.05$; Wilcoxon test) from an average of 115.0 ml/1oog min to an average of 65.8 ml/1oog min. CMR-oxygen also decreased significantly from an average of 5.75 ml/1oog min to 3.72 ml/1oog min, as well as CMR-glucose from an average of 12.98 mg/1oog min to 5.05 mg/1oog min. CMR-lactate remained unchanged (1.18 and 1.44 mg/1oog min, resp.), (Tab. 1)

The score comprising CBF, CMR-oxygen and CMR-lactate fell significantly from 27 (highest value) to 14 (medium value), (Fig.1). Clinically, the acute psychotic abnormalities disappeared during this time. However, all patients still remained psychopathologically disturbed.

In patients with paranoia or schizophrenia simplex no significant changes of CBF (62.0 and 45.2 ml/1oog min), of CMR-oxygen (2.98 and 3.21 ml/1oog min), of CMR-glucose (6.08 and 6.33 mg/1oog min), of CMR-lactate (0.38 and 0.62 mg/1oog min) and of the score (14 and 14) (Tab.1) occurred during the course of the psychosis. The clinical status did not change markedly.

It is concluded that in patients with productive schizophrenia a relationship exists between blood flow and oxidative metabolism of the brain on the one hand and the clinical state of the schizophrenic psychosis on the other. Measurements of these biological parameters of the brain would seem to be useful in estimating the degree of mental abnormalities in schizophrenia.

References

1. Hoyer, S. and Oesterreich, K. (1975): Psychiatria clin. 8, 304-313.
2. Ingvar, D.H. and Franzen, G. (1974): Acta psychiat.scand. 50, 425-462.

	Productive S. I	Productive S. II	Paranoid S. I	Paranoid S. II	
CBF	115.0	65.8+	62.0	45.2	ml/1oog min
CMR-oxygen	5.76	3.72+	2.98	3.21	ml/1oog min
CMR-glucose	12.98	5.05+	6.08	6.33	mg/1oog min
CMR-lactate	1.18	1.44	0.38	0.62	mg/1oog min
Score	27	14+	14	14	
n	11		7		
interval		32		38	days

Tab.1: Medians of CBF, CMR-oxygen, CMR-glucose and CMR-lactate in patients with productive and paranoid schizophrenias in the acute psychotic phase (I) and in the course of the psychosis (II).
+ $p \leq 0.05$

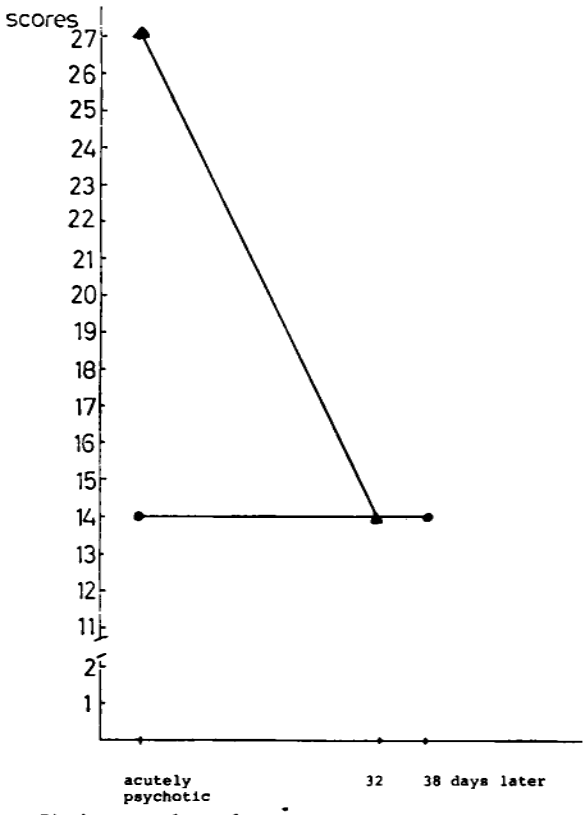

Fig.1: Mean values of scores in patients with productive (▲——▲) and paranoid (●——●) schizophrenia in the course of the psychosis.