nerve. Facial nerve paralysis on the same side indicated a spread of the infection to the nucleus in the pons. Such a paralysis appearing a few days after the eruption in motor areas unrelated to the affected sensory area has been described by Kendall.[2] The interesting feature of our case was the development of disabling postural hypotension. There were no associated conditions like low output states, electrolyte disturbances, or endocrine insufficiencies nor was she taking any drugs. Viral infections interfere with baroreceptor reflexes. Postural hypotension has been described in bulbar poliomyelitis[3] and in Landry-Guillain-Barré syndrome and is thought to be due to functional impairment of the central structure concerned with the maintenance of peripheral vascular tone.[4] It improves with clinical improvement. The postural hypotension in our case was probably due to zoster involvement of the brain stem around the facial nucleus, because the reticular formation in the brain stem has a profound influence on the vascular reflexes.[1]

Fluorohydrocortisone is probably the most effective agent for correcting postural hypotension. It acts by retaining sodium, increasing extracellular fluid volume, and sensitising the vessel wall to circulating pressure amines leading to vasoconstriction. We do not think postural hypotension following zoster infection has been described before.

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Department of Geriatric Medicine, HM Stanley Hospital, St Asaph, Clwyd

B K BHOWMICK, MD, MRCP, consultant physician
J P ARNOLD, MD, FRCP, consultant physician

Recoverable organic psychosis after hypopituitary coma

An organic psychosis, with cognitive changes after hypopituitary coma, is described in a 44-year-old woman who made an excellent recovery after treatment. After the acute psychotic symptoms subsided electroencephalogram (ECG) changes reverted to normal, but cognitive defects persisted. The case reported here illustrates the importance of long-term psychiatric rehabilitation, since the organic psychosis eventually proved recoverable.

Case report

The patient was initially referred to a hospital in June 1971 with complaints of tiredness, headaches, memory loss, and cold intolerance. She had had no periods for three months. There was no history of postpartum haemorrhage after her pregnancies in 1961 and 1968. At referral a skull *x*-ray examination showed no enlargement of the pituitary fossa, and protein-bound iodine was 181 nmol/l (2·3 μg/100 ml; (normal range 275-570 nmol/l 3·5-7·2 μg/100 ml)). A tentative diagnosis of viral encephalitis was made, but viral studies proved negative. Her symptoms improved, and she was followed up at outpatients. Amenorrhoea persisted, and three months later serum thyroxine (T4) was 22 nmol/l (1·8 ng/ml; (normal range 60-170 nmol/l 5·0-13·7 ng/ml)) and the random plasma cortisol was 55 nmol/l (2·0 μg/100 ml; (normal range 200-700 nmol/l (7·0-25·0 μg/ml)). Hypopituitarism was diagnosed and she was started on T4 0·2 mg daily, which she took for only three months.

In August 1972 she was admitted as an emergency to King's College Hospital in deep coma. Details of her previous investigations were not known at this time. Her skin was pale and wrinkled, and body hair was absent. She showed decerebrate posturing and there were bilateral pyramidal signs with spasticity of the limbs. Her blood sugar was 1·0 nmol/l (18 mg/100 ml), serum sodium 129 mmol/l (129 mEq/l). Other electrolytes were normal. A clinical diagnosis of hypopituitary coma with associated hypoglycaemia was made, and she was given intravenous 50% glucose followed by 5% dextrose and normal saline. Blood was taken for estimating serum T4, free T4 index, and plasma cortisol. Six hours after admission her condition had improved, although her consciousness remained impaired. Because of the urgency of the clinical situation, treatment was started with hydrocortisone and tri-iodothyronine without further detailed investigation of pituitary function. The plasma cortisol before treatment was 80 nmol/l (3·0 μg/100 ml), serum T4 40 nmol/l (3·3 ng/ml), T4 resin ratio 0·89, and free T4 index 36.

She was admitted to a psychiatric hospital in September 1972, and initially appeared mentally confused. She showed extreme emotional lability and was disorientated in place and time. Her short-term memory was greatly impaired, hormone replacement therapy was continued, and she was treated with a phenothiazine which improved her emotional lability. Investigations included the Weschler Adult Intelligence Scale (WAIS) in October 1972 on which her full-scale score was 67 (see table). On the ward she was incontinent for the first few weeks. She gradually became able to concentrate on activities in the occupational therapy department and gradually spent more and more time at home. She eventually became a day patient and was finally discharged in November 1974. At this time she was bright and cheerful and showed no psychiatric symptoms whatsoever. Psychological testing in April 1975 showed a considerable improvement on the performance scale and some improvement on the verbal scale (see table); an EEG was normal.

Discussion

The possibility of psychiatric disorders such as depression and paranoid psychosis resulting from Addison's disease, are well known. The psychiatric manifestations found in the present case, however, as well as in similar cases,[1-3] are more complex, and include cognitive defects after coma. Hypoglycaemia and hypotension are presumably important factors in the genesis of the subsequent psychiatric disorder as well as adrenal insufficiency. The relative contribution of these three factors is no less conjectural today than at the time of Blau and Hinton's paper,[1] since few cases have been reported in detail. The recoverable organic psychosis reported by Igishu *et al*[3]

Case reports of recoverable organic psychoses due to hypopituitarism

	Blau and Hinton[1] (1960)	Hanna[2] (1970)	Igisu *et al*[3] (1973)	Parker *et al* (present report)
Coma	+	+	−	+
Relation of psychosis to coma	Following	Preceding		Following, but some psychiatric symptoms preceding
Nature of psychosis	Aggressive outbursts, suspiciousness, fluctuating mood, serious memory impairment, disorientation	Paranoid delusions, auditory hallucinations, gross impairment of recent memory, disorientation	Paranoid delusions, visual hallucinations, extreme apathy, some disorientation	Extreme emotional lability, gross impairment of recent memory, disorientation
Duration of psychosis	3 months	Almost 2 years	⩾2 years	Almost 2 years
Improvement in IQ			64-88 (WAIS)	Verbal score 71-76, performance score 65-79 (WAIS)
EEG changes:				
Soon after coma	Generalised, symmetrical disturbance, slowing of cerebral activity, 5-7 cycles/sec, 30-40 μV without blocking responses to visual attention	Severe generalised abnormalities, no normal alpha rhythm, numerous 6 Hz rhythms interspersed by short episodes of 2-3 Hz waves		
At onset of psychotic symptoms			Background activity: mod-high voltage, rhythmic and irregular delta and theta waves, continuous high amplitude rhythmic delta and theta activities anteriorly	Symmetrical disturbance, alpha rhythm poorly formed, excess theta activity
On recovery from psychosis	Alpha rhythm 9 cycles/sec with greatly decreased slow activity	?	Disappearance of high voltage delta waves, reversion of EEG to "almost normal"	9-11 c/s alpha rhythm "normal EEG"

suggests that whatever the metabolic cause for such psychoses and cognitive defects they may be sufficient to produce their effects without the onset of coma. Initial loss of alpha rhythm in the EEG in cases of hypopituitarism and hypopituitary coma, has been described.[4 5] The EEG changes in our case and in other similar cases include disturbances of alpha rhythm and other non-specific changes compatible with severe metabolic disorder.

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Maudsley Hospital, Denmark Hill, London SE5
R R PARKER, MB, MRCPSYCH, research worker, Institute of Psychiatry, and honorary senior registrar
A D ISAACS, MRCPSYCH, DPM, consultant psychiatrist

King's College Hospital, London SE5
C G McKERRON, MB, FRCP, senior lecturer and consultant physician

Long-term perhexiline maleate and liver function

Perhexiline maleate relieves angina in some patients,[1 2] but serum transaminase levels may rise after prolonged treatment, and this rise seems to be dose related.[3 4]

Patients, methods, and results

Sixteen men with stable angina resistant to other treatment had received perhexilene maleate for an average of 12·5 months. Six took 200 mg and 10 took 400 mg a day. All of them were satisfied with the drug, and therefore formed a selected group. While treatment continued baseline haematological values and electrolytes were estimated and standard liver function tests were carried out. D-glutamyltransferase (DGT) (2.3.2.1), isocitric dehydrogenase (ICD), and bromsulphthalein (BSP) excretion were also estimated. The drug was then withdrawn for one month with the patients' consent while other medication was continued. The results do not identify the six on concurrent medication from the others in the study. One took methyldopa and another clofibrate. It may be important that none was taking anticoagulants.[5] After a month without the drug all tests were repeated. The drug was restarted in the same dose and tests repeated after a further month. Seven patients, while on the drug, had abnormal serum transaminase levels at some time before the trial. In four patients this abnormality resolved spontaneously, in two it resolved with dose reduction, and in one levels were persistently abnormal at 25 IU/l.

Four patients could not complete a month off perhexilene maleate because of intolerable angina but their inclusion in the baseline findings did not produce a bias. For technical and ethical reasons it was possible to repeat the bromsulphthalein test in only 10 patients—five in each dose group. Haematological values and electrolytes were normal except in one patient with asymptomatic chronic lymphatic leukaemia. Bilirubin, alkaline phosphatase, 5′-nucleotidase, and ICD were insensitive indicators of liver function. No consistent changes were seen with alterations in therapy.

Aspartate aminotransferase was raised in three patients but did not exceed 32 IU/l. Two patients developed the abnormality while off the drug. One man had concomitant abnormalities of 5′-nucleotidase, DGT, and BSP excretion and improved biochemically when off perhexilene maleate.

DGT was the enzyme most often raised. Before altering treatment it was high in two patients on 200 mg and six on 400 mg a day (mean (± SE of mean) 49 ± 8 IU). Those completing the trial protocol improved when off treatment (see table), and a paired t test showed this to be just statistically significant ($0{\cdot}05>P>0{\cdot}02$). There was no statistically significant change on restarting the drug. Baseline BSP excretion was abnormal in three men on 200 mg and nine on 400 mg a day. Of those who managed a month off the drug BSP retention decreased significantly from a mean of 10·4 μmol/l (0·87 mg/100 ml) to 5·1 μmol/l (0·43 mg/100 ml) at 45 minutes ($0{\cdot}05>P>0{\cdot}02$). Side effects were not regarded as important by the patients although one man in this trial, and another subsequently, reported poor urinary stream and dribbling incontinence which resolved when the drug was stopped. On direct questioning 12 were impotent and nine blamed the drug. A month off treatment made no difference.

Comment

It is reassuring that with modest doses of perhexilene maleate standard tests of liver function rarely gave abnormal results even after two years of treatment. Sensitive tests such as DGT and BSP excretion, however, indicated liver specific abnormalities in 50-75% of our patients depending on the test used. These abnormalities regressed after a month off treatment.

The results of DGT and BSP excretion tests did not always run parallel, which suggested that the tests measure independent features of liver metabolism affected to different degrees in different patients.

Impotence was common but readily accepted by the patients. Dysuria seems a new side effect.

We regard the liver specific abnormalities shown in this small group of selected patients as acceptable in view of the clinical benefit but would recommend treatment with the smallest effective dose of perhexilene maleate.

We acknowledge the advice of Dr G Walters and the help of Dr G Hunt in the biochemical tests. Perhexilene maleate (Pexid) was supplied by Merrell Division, Richardson-Merrell Ltd.

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Bristol Royal Hospitals, Bristol BS1 6SY
D J HOWARD, MB, MRCP, senior house officer in general medicine
J RUSSELL REES, MD, FRCP, consultant physician

DGT levels and BSP retention in 12 patients according to dose of perhexilene maleate, duration of treatment, and change with variation of treatment

	Perhexiline 200 mg/day					Perhexiline 400 mg/day						
Case No (and duration of treatment in months):	1 (3)	2 (4·5)	3 (5)	4 (8)	5 (24)	6 (5)	7 (6)	8 (8)	9 (10)	10 (24)	11 (24)	12 (28)
D-glutamyltransferase (normal <25 U/l)												
Normal initially:												
On perhexiline	12	6	7			10				25		
After a month off perhexiline	18	1	9			6				27		
Month after restarting perhexiline	17	13	22			17				29		
Abnormal initially:												
On perhexiline				34	37		46	100	31		55	54
After a month off perhexiline				27	28		42	58	17		42	31
Month after restarting perhexiline				31	37		29	64	30		36	40
Bromsulphthalein at 45 minutes (normal <6 μmol/l)												
Normal initially:												
On perhexiline		6·0			6·0							6·0
After a month off perhexiline		1·2			2·4							7·2
Month after restarting perhexiline		0·6			3·6							7·2
Abnormal initially:												
On perhexiline	8·4		14·3	11·9		13·1			11·9	8·4	11·9	
After month off perhexiline	3·6		3·6	0·6		8·5			2·4	14·3	10·7	
Month after restarting perhexiline	4·8		13·1			4·8			—	9·6	—	

Conversion: SI to traditional units—Bromsulphthalein; 1 μmol/l ≈ 0·084 mg/100 ml.