Serial Radionuclide Scans in Multiple Sclerosis.

SHIRLEY MURRAY AND OTTO F. VEIDLINGER

SUMMARY: *A 28 year old woman with multiple sclerosis has been followed for 10 months with serial brain scans on 5 admissions. The correlation between the clinical picture and the brain scans was clearly demonstrated.*

RÉSUMÉ: *Nous avons suivi pendant dix mois, grâce à des gammaencephalography sériées, l'évolution pendant cinq admissions d'une femme de 28 ans atteinte de sclérose en plaques. La corrélation entre le tableau clinique et les gammaencephalography est clairement démontrée.*

From the Departments of Medicine and Radiological Sciences, University of Toronto and Women's College Hospital, Toronto, Ontario.

Reprint requests to Dr. Otto F. Veidlinger, 311 Sherbourne St., Toronto, Ontario M5A 3Y1 Canada.

CASE REPORT

A 28 year old woman first presented in December, 1974 with an 18 month history of headaches, anxiety, and depression. Two months prior to admission she developed slight unsteadiness, vague memory loss, and paresthesiae in her extremities. On examination, there were no focal neurological signs. Hemoglobin was 12.3 gm. percent, white blood count 8,900, erythrocyte sedimentation rate 38 mm. Spinal fluid examination showed a protein of 61 mg. percent, with a normal electrophoretic pattern and no cells. EEG was normal. Brain scan (nuclide) showed a diffusely increased uptake in the superior frontal area of the left hemisphere on the anterior view. This was not seen on the lateral view. No firm diagnosis was made, she improved, and was discharged home.

In January, 1975, she developed more pronounced staggering as well as slurring of speech. On examination, she had mild lateral nystagmus and ataxia on the finger-to-nose test on the left. A pneumoencephalogram showed blunting of the lateral angles of both lateral ventricles, particularly the left ventricle, which appeared slightly larger than the right. The C.S.F. protein was 73 mg. percent on this occasion, again with a normal electrophoretic pattern. The erythrocyte sedimentation rate was 42 mm., serum electrophoresis was normal. EEG was again normal. The increased uptake on the left side on the brain scan cleared.

She presented for the third time in March, 1975 with euphoria, a right spastic hemiparesis, and loss of vision in the left eye. A brain scan showed a well defined area of increased activity in the left hemisphere. A left carotid angiogram showed excellent opacification of the left cerebral vasculature and was normal. She was treated with ACTH and improved sufficiently to return home after three weeks in hospital.

Her fourth admission was in April, 1975 for acute onset of aphasia as well as exacerbation of the right sided weakness. The loss of vision in the left eye had improved. The left frontal lesion on the brain scan was enlarged. She was treated with dexamethasone and again made some improvement.

In September, 1975 she had her fifth hospital admission for headaches, nausea, and memory loss. On examination, she was euphoric with poor recent memory. She had a left homonymous hemianopia, left facial weakness, and left hemiparesis. A C.S.F. examination showed a protein of 72 mg. percent, with a normal electrophoresis. The brain scan showed a clearing of the left-sided lesion and the appearance of two new lesions deep in the right parieto-occipital and fronto-pariental areas, corresponding to the symptoms of the left homonymous hemianopia and left hemiparesis.

Another admission in April, 1976 was marked by euphoria, dementia, and bilateral spastic weakness. The hemianopia was not present. No investigations were performed and the patient was placed in a chronic care facility. We thought that the diagnosis of multiple sclerosis was clinically established.

DISCUSSION:

Abnormal brain scans in multiple sclerosis (M.S.) have been infrequently reported. Gize and Mishkin (1970) reported two positive scans which were initially interpreted as showing tumor and subsequently proven to be due to M.S. They then reviewed 28 patients with clinical M.S., half of them scanned with ^{203}HG Chlormerodrin and half

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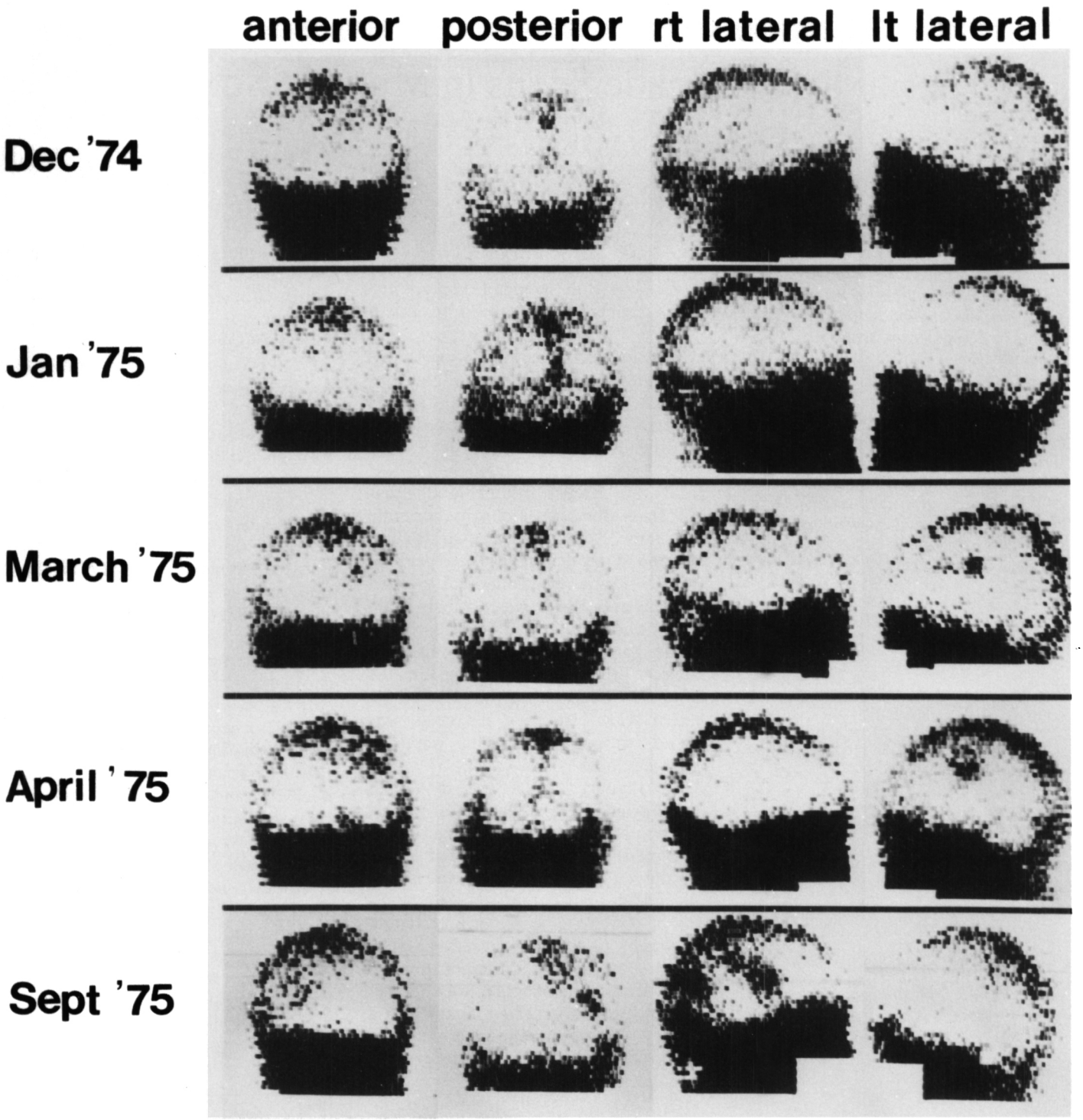

Figure 1 — Serial abnormalities in radionuclide brain scans in a case of multiple sclerosis over a ten month period.

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with ^{99m}TC Pertechnetate. There were five abnormal scans out of the 14 cases with active disease. None of the cases of inactive disease had an abnormal scan. Cohan, Fermaglich and Auth (1975) reviewed a series of 38 cases with the diagnosis of M.S. and noted that all had normal scans. Antunes, Schlesinger and Michelsen (1974) found abnormal scans in three out of 160 patients with M.S. The majority of these patients were scanned with ^{197}HG Chlormerodrin. They noted that there was only one positive scan in a case histologically confirmed as M.S. in the literature. They included one interesting example with orbital uptake in a case of optic neuritis. Moses, Davis and Wagner (1972) set very specific criteria for the diagnosis of M.S. and in 19 patients did not observe a single positive brain scan. More recently, Warren et al (1976) reported a case in which computer tomography showed multiple small areas with diminished density both developing and decreasing in size during the course of the disease in a case of multiple sclerosis. Several lesions were also seen on the T.C. ^{99m} brain scintigrams.

The present case demonstrated striking abnormalities in the radioisotope scans with regression and appearance of new abnormalities which correlated with the changing clinical picture in a case of M.S. This was demonstrated on five different admissions. On the second admission where the symptoms were those of brain stem involvement, abnormalities were not found, probably due to the size and location of the lesion.

TABLE I

ADMISSION DATE	SYMPTOMS AND SIGNS	BRAIN SCAN
DECEMBER, 1974	Headaches, anxiety, and depression. Slight staggering.	Diffusely increased uptake superior frontal area left hemisphere on anterior view. Not seen on lateral view.
JANUARY, 1975	After improvement further staggering and slurred speech. Mild nystagmus and ataxia	Clearing of increased uptake on left.
MARCH, 1975	Euphoria and slurred speech. Right spastic weakness. Visual loss left eye.	Well defined area of increased activity at the frontal level deep in the left hemisphere.
APRIL, 1975	Aphasia. Marked right spastic paralysis.	Enlarging and changing left frontal lesion
SEPTEMBER, 1975	Severe headache and dementia. Right paralysis cleared. Left homonymous hemianopia and left sided weakness developed.	Lesion on left side cleared. Two new lesions deep in the right parieto-occipital and fronto-parietal areas.

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