IgG Myeloma in Cerebrospinal Fluid with a Total Protein of 32 mg./100 ml.

[WITH SPECIAL PLATE ON FACING PAGE]

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The following case is reported because of the finding of an IgG myeloma revealed electrophoretically and immunoelectrophoretically in a lumbar cerebrospinal fluid with a total protein of 32 mg./100 ml.

CASE REPORT

A 47-year-old man had been in good health apart from occasional attacks of "funny feelings" which had troubled him for nine years. These occurred at varying intervals of about three days to one a month, lasting for 5 to 30 seconds and clearing spontaneously. He said that during these episodes "things go different, things seem to change, and everything looks distant." For the past few years he had also been subjected to grand mal attacks occurring about every two months. He was investigated at Maida Vale Hospital in December 1962, a diagnosis being made of temporal lobe epilepsy. The blood count was within normal limits but the E.S.R. (Westergren) was 20 mm. In September 1965, five months before his second admission, he first noticed attacks of dizziness, especially on looking up, and a tendency to fall to the left coming on about three times a week. In addition, he complained of tinnitus in the right ear.

On examination he was found to be fully alert, and his intelligence was normal. The optic fundi were healthy. The cranial nerves were normal, and so were the upper limbs, trunk, and lower limbs. There was no abnormality in the respiratory, gastrointestinal, and cardiovascular systems.

The E.E.G. was abnormal predominantly in the right anterior temporal region, where episodes of spike and slow-wave discharges occurred. In one of these episodes the patient was apparently unable to respond to command. The air encephalogram and x-ray films of the chest, skull, pelvis, abdomen, and soft tissues were not remarkable. Routine testing for urinary protein was negative, but Bence Jones thermosoluble protein was present in trace amount. E.S.R. (Westergren) 22 mm. Spinal fluid: clear and colourless; 2 cells per cu. mm. (small lymphocytes); total protein 32 mg./100 ml.; Wassermann negative.

A diagnosis was made of temporal lobe epilepsy with no evidence of a space-occupying lesion.

Electrophoretic and Immunoelectrophoretic Studies.—On two occasions we were able to carry out C.S.F., serum, and urinary protein electrophoresis and immunoelectrophoresis. For the simple electrophoresis Kohn's (1958) cellulose acetate technique was used. Three microlitres of serum or C.S.F. (this latter concentrated approximately 100 times) were applied under 120 v. constant current for 45 minutes. A barbitone buffer of pH 8.6 and ionic strength of 0.05 was used. The immunoelectrophoretic studies were conducted by the Scheidegger (1955) modification of the immunoelectrophoretic technique developed by Grabar and Williams (1953) in the serum and by Gavrilescu *et al.* (1955) in the cerebrospinal fluid. Protein was concentrated by the Mies (1953) method. For the immunoelectrophoresis use was made of horse and rabbit anti-normal human sera as well as anti-IgG (Immunology Inc., Chicago). The C.S.F. electrophoresis (Special Plate, Fig. 1a) showed an elevated compact band in the gamma region characteristic of IgG myeloma. This finding was fully confirmed by immunoelectrophoresis (Special Plate, Fig. 1b), which showed the abnormality affecting the gamma-globulin in the corresponding electrophoretic position—namely,

reduplication in the lower part and thickening in the upper arc. These perceptible differences in antigenic specificity were located in the "high speed" area of the gammaglobulin. Fig. 1c (Special Plate) shows the C.S.F. protein immunoelectrophoresis with IgG antiserum bringing up once more the characteristic image of an IgG myeloma. The total serum protein was 9.1 g./100 ml., the electrophoresis and immunoelectrophoresis were showing the same IgG abnormalities as the C.S.F.

A sternal marrow puncture carried out by Dr. M. Batata showed an average normal cellularity with a slight increase in morphologically normal plasma cells but with the presence of a large number of abnormal cells (Special Plate, Fig. 2). These latter were of three types: (a) cells which resembled though were not identical with plasma cells 7–12 μ in diameter (mature variety); (b) large cells 20–30 μ in diameter with abundant pale or dark blue cytoplasm and a large round or oval nucleus, fine chromatin, and sometimes nucleoli; and (c) giant cells with two or more nuclei, the cytoplasm often containing azure granules, clear vacuoles, or having a clear perinuclear zone. The marrow was normoblastic, granulopoiesis was normal, and the megakaryocytes were normal. The appearances were regarded as being consistent with myelomatosis.

COMMENT

The finding of IgG myeloma in a C.S.F. with a total protein of 32 mg./100 ml. is noteworthy. In view of the fact that no symptoms or signs were present to indicate the presence of a myeloma—as so often happens—and that other tests gave no indication either, the importance of the electrophoresis and immunoelectrophoresis is apparent. As the total C.S.F. protein was within normal limits and the blood-brain barrier was apparently unaffected, the protein abnormality found in the C.S.F. is unlikely to have been conveyed through the blood stream, and one must consider the likelihood of its being the local product of myeloma tumour cells.

Plasma cell tumours within the cranial cavity are exceptional, but French (1947) described such a tumour in the third ventricle impinging on the chiasm, but examination of the bone marrow was not made. In our case there was no evidence of a space-occupying lesion within the cranial cavity. In a case of multiple myeloma involving bone marrow and lymph node Kramer (1963) described a tumour within the right temporal lobe consisting of a perivascular proliferation of reticulo-endothelial cells evolving in the same way as in the marrow.

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REFERENCES

- French, J. D. (1947). *J. Neuropath. exp. Neurol.*, 6, 265.
Gavrilescu, K., Uriel, J., Courcon, J., Lewin, J., Hillion, P., and Grabar, P. (1955). *Nature (Lond.)*, 176, 976.
Grabar, P., and Williams, C. A. (1953). *Biochim. biophys. Acta (Amst.)*, 10, 193.
Kohn, J. (1958). *Clin. chim. Acta*, 3, 450.
Kramer, W. (1963). *Acta neuropath. (Berl.)*, 2, 438.
Mies, H. J. (1953). *Klin. Wschr.*, 31, 159.
Scheidegger, J. J. (1955). *Int. Arch. Allergy*, 7, 107.

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FIG. 1 (a)

FIG. 1 (c)

FIG 1 (d)

FIG. 1

(a) C.S.F. electrophoresis.

(c) Anti-IgG showing IgG myeloma.

(b) Immunelectrophoresis.

(d) Normal C.S.F./IgG.

FIG. 1 (b)

FIG. 2.—Sternal marrow smear showing a group of abnormal cells resembling plasmablasts ("myeloma cells").

FIG. 2