NEUROLOGIC COMPLICATIONS OF LEUKEMIAS AND LYMPHOMAS*

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Since the first report of complications of the nervous system in leukemia by Burns in 1823, there have been sporadic case reports in the medical literature. Schwab and Weiss, in a review of the literature from 1835 to 1935, found 146 cases of leukemia with neurologic complications. They also reported a case of their own in which the patient had headache, nausea and vomiting, and multiple cranial-nerve involvement which responded temporarily to roentgen-ray treatment.

In 1927, Trömmer and Wohlwill reported 12 cases of leukemia, with neurologic complications in 9 of these. At necropsy in 11 of the 12 cases (91 per cent) there was microscopic evidence of invasion of the central nervous system.

Critchley and Greenfield in 1930 reported a series of patients with chloroma and leukemia who exhibited spinal symptoms. Another 14 cases of leukemia with cerebral involvement were added by Diamond. Five of these were myelogenous, 4 lymphatic, 2 myeloblastic, 2 stem cell, and one monocytic in type. In all cases he described infiltration of the pia mater and perivascular spaces. He stated that the infiltration about the chiasm could give rise to papilledema.

In 1945 Leidler and Russell reported 20 cases of their own and reviewed a total of 65 cases of leukemia with neurologic complications. They concluded that 80 per cent of patients with leukemia have significant pathologic changes in the brain and that 20 to 35 per cent of patients with leukemia have neurologic symptoms and signs. In their series, hemorrhage into the central nervous system was the cause of death in 29 per cent of cases.

Sparling et al. in 1947 reported neurologic complications in 20 per cent of lymphatic leukemias in their series and alluded to infiltration of arachnoidal membranes and perineurium of cranial nerves in patients with signs of meningeal irritation, cranial-nerve palsies, headache and diplopia. They noted transient improvement in such patients when treated with small doses of roentgen rays to the cranial vault, and commented that the pathogenesis of the infiltrate was not well understood since the neurologic complications could occur when peripheral blood was normal.

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Sansone in 1954 reported 2 cases of children with acute lymphatic leukemia in whom, during remission of the disorder in peripheral blood and bone marrow, there developed headache, visual defects, meningeal symptoms, paresthesias, and papilledema. There was increase in cerebrospinal fluid pressure, white cells, and protein, with decreased sugar and negative cultures. Separation of the sutures and convolutional atrophy were present on roentgenograms of the skull. These patients showed transient improvement when treated with intrathecal Aminopterin, but later blindness developed, and they died of their disease.

In a more recent article Wells and Silver (1957) reported the neurologic manifestations of a group of 63 patients with acute leukemias.

As regards involvement of the central nervous system in Hodgkin’s disease, syndromes produced by spinal and cranial involvement have been described. Fifty-four such cases were recorded in the literature up to 1929; in 42 of these the lesions were spinal extradural and 12 were cranial lesions. Goldman and Victor reported transverse myelopathies in approximately 5 per cent of their cases. Ginsburg reported invasion of the central nervous system in 10 of 36 cases and Weil reported that 14 per cent of patients with Hodgkin’s disease showed involvement of the spinal cord. Very rarely does direct invasion of the central nervous system occur. When it does it is usually of the sarcomatous type and metastatic in origin.

Schricker and Smith reported a case of apparently primary nonsarcomatous intracerebral Hodgkin’s disease in a 45-year-old white male which was proven histologically following surgical removal by Dr. H. G. Schwartz. This patient is alive without signs of recurrence 6 years later. There have never been systemic symptoms or signs of Hodgkin’s disease present.

Fein and Newill recently reported a case of cerebral invasion by contiguity. Gordon, in a recent article, stated that Hodgkin’s disease may be present with signs of involvement of the spinal cord as the initial manifestation of the disease.

The other lymphoma that attacks the nervous system frequently is lymphosarcoma. It may affect spinal cord as well as intracranial structures. It may infiltrate the epidural space, causing compression of the spinal cord, or may invade the cerebral leptomeninges, causing cranial-nerve palsies, headache, and slight rigidity of the neck.

It is the purpose of this paper to present our experiences with the neurologic complications occurring in 1,264 cases of leukemia and lymphoma seen at the Ohio State University Hospital in a 3-year period from 1954 to 1957, to outline clinically recognizable neurologic syndromes, and to suggest methods of management.

MATERIAL

In the past 3 years, the neurosurgical and hematologic services of the Ohio State University Hospital have cooperated closely in the study of all patients suffering from leukemia or lymphoma who showed evidence of