THE VALUE OF AIR ENCEPHALOGRAPHY AND CEREBRAL ARTERIOGRAPHY IN THE DIAGNOSIS OF HEADACHE

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ALTHOUGH pain in the head is a common and stubborn complaint, the underlying cause usually is benign, and its source more often outside the cranium than within.

The most common pain producing mechanism is an excessive relaxation and dilatation of the extracranial arteries; these vessels are for the most part branches of the external carotid artery. Thus, extracranial vascular headache is the most prevalent type. As a consequence of difference in location and clinical pattern, various names have been given to this form of head pain: migraine, atypical migraine, histamine cephalgia, atypical facial neuralgia, tension vascular and hypertensive headache. The underlying mechanism appears to be similar in all of these, and basically they are all related. A strong familial tendency has also been noted, and emotional and nervous tension factors usually play an important role. It frequently occurs in a setting of tension, fatigue, or frustration, or in the period of relaxation afterwards.

The second most common pain producing mechanism is related to sustained contractions of the muscles of the head and neck which give rise to a muscle tension headache. This may be primary or secondary to any other pain in the head. As is true of the extracranial vascular type, the primary muscle tension headache is usually due to various emotional and nervous factors.

In the past the role of the eyes, nose and sinuses in the production of head pain has been stressed. Notwithstanding the voluminous literature on the subject, it appears that these structures do not commonly produce this symptom; at least they are not responsible for the many severe forms constantly reported by patients to the headache consultant.

Although the great majority of chronic and recurring headaches are extracranial in origin and benign, the possibility of an intracranial lesion should be considered. Usually the differentiation can be made without much trouble, but sometimes complicated neurologic studies must be carried out. Many patients seek medical attention, not because the pain is intolerable, but because there is an underlying fear of brain tumor. Such patients must be reassured, and most of them can be reassured without resorting to neurosurgical diagnostic procedures. The indiscriminate use of air encephalography, ventriculography, and cerebral arteriography in patients with benign syndromes is to be condemned. These procedures are not entirely innocuous, and they are expensive. When not indicated, they may do a great deal of harm by creating further

apprehension or serving to fix the headache. The financial burden alone may be enough to create further headache.

Yet, the air encephalogram and cerebral arteriogram are valuable and necessary diagnostic aids. Positive evidence of an intracranial lesion allows a direct surgical attack with the resultant saving of lives; evidence ruling out an intracranial lesion may be equally valuable. Since headache is the first symptom of one third of supra-tentorial tumors and is usually the first symptom in posterior fossa tumors, except for those located in the cerebellopontine angle,[1] the advisability of obtaining an air encephalogram or arteriogram is frequently a problem. If there are positive physical or x-ray findings, the decision is relatively easy. Abnormality of the spinal fluid warrents further study. A well-taken history is often of great help although the severity of the headache alone should not be a determining factor, since the benign variety is frequently the most severe. When headache is the only symptom and the neurologic, roentgenologic, and spinal fluid studies are normal, how often are neurosurgical diagnostic procedures indicated? If carried out, how often is an intracranial lesion demonstrated? In an attempt to answer these questions, the following study was made.

Method

The records of all patients in the Department of Neurological Surgery of the Cleveland Clinic undergoing air encephalography, cerebral arteriography, or both during the years 1948 and 1949 were reviewed. These years were chosen in order to allow sufficient time for adequate follow-up. Selected for study were those patients who complained only of headache and in whom the neurologic examination, x-ray studies and spinal fluid were entirely normal. There were 43 such patients, 21 men and 22 women, during the two year period. Their average age was 35 years. In addition to the previously described procedures, electroencephalograms had been obtained in 16 instances: nine were found to be normal, five possibly abnormal, and two abnormal. Of these 43 patients, 34 were subjected to air encephalography, 4 to cerebral arteriography, and 5 to both procedures.

Result

From a positive standpoint the result of the neurosurgical diagnostic procedures in these cases was most discouraging. All of the air encephalograms and cerebral arteriograms were normal, and not a single organic lesion was demonstrated. In so far as is known, no intracranial lesion appeared subsequently. This does not mean the procedures were totally unprofitable, for the presence of an intracranial lesion could be ruled out in each case. In this regard the tests were for the most part justifiable and in many instances truly necessary. However, it is probable that many of the studies were ordered merely because of the presence of severe recurrent headache. Each case must be evaluated critically. There is still no substitute for a carefully taken history interpreted in the light of wide experience by a physician interested in the problem of headache.

CONCLUSIONS

1. In a series of patients seen during a period of two years with the single neurologic complaint of headache, in whom the neurologic, roentgenologic and spinal fluid examinations were normal, air encephalography, cerebral arteriography, or a combination of these two procedures were carried out in 43 instances.

2. Not a single organic intracranial lesion was demonstrated.

Reference

1. Wolff, Harold G.: Headache and Other Head Pain. New York, Oxford, 1948, p. 642.