Report on the Cooperative Study of Intracranial Aneurysms and Subarachnoid Hemorrhage

SECTION II
General Survey of Cases in the Central Registry and Characteristics of the Sample Population*

HERBERT B. LOCKSLEY, M.D.; A. L. SAHS, M.D.; AND LLOYD KNOWLER, PH.D.**

From early 1958, until the registering of new cases ended in May 1965, 6368 case reports entered the Central Registry of the Cooperative Study of Intracranial Aneurysms and Subarachnoid Hemorrhage from 20 participating university centers (Table 1). These cases had in common either a history of spontaneous non-traumatic subarachnoid hemorrhage (SAH), or the finding of an intracranial aneurysm or arteriovenous malformation (AVM).

Each case was reported on a standard set of protocol forms which encompassed some 3089 items of coded information. To these forms were usually appended a narrative summary, reproductions of diagnostic angiograms, copies of operative notes, and pathology reports.

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** Central Registry of the Cooperative Study, Division of Neurosurgery, Department of Neurology, Department of Mathematics, University of Iowa, Iowa City, Iowa.

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The Case Report Protocol—Instrument of the Study

The standard protocol used for reporting cases comprised six separate, color-coded fascicles designed for transfer of data to punch cards. These fascicles were concerned with: (1) history, clinical examination and laboratory data, (2) angiographic technic, findings and complications, (3) surgical treatment with details of technic and complications, (4) nonsurgical treatment details, (5) follow-up information with an estimate of degree of disability; and, in case of death, the date and relationship of “cause” to the disease under study, and (6) pathology—for reporting findings at autopsy or pertaining to surgical specimens. These fascicles were devised by several committees of participants at the outset of the Study with the Central Registry serving a coordinating and unifying role. After 732 cases had been reported on the “original protocol,” a revision was made toward greater clarity, enhanced reporting of surgical data, and structural improvement to facilitate data processing. This “revised protocol” has been used unchanged for the last 5636 cases, and has proved to be a remarkably good instrument.

As the number of cases and number of fascicles per case increased, complex punch-card sorting analysis became impractical (there are now approximately 50,000 punch cards in the Study), and in 1963, a computer program was devised which brought the data of the original and revised protocols into congruity and transferred the entire body of data to magnetic tape. The analyses reported here and in subsequent papers are each based on specially designed programs for use on the
1401/1460 IBM electronic computer system at the University of Iowa.

In this report, it is proposed to: 1) survey and classify the major causes of subarachnoid hemorrhage reported in the Study, 2) enumerate the case contributions made by the participating centers, 3) characterize the general nature of the sample population of the Study, 4) consider the methods by which these patients were studied and treated, and 5) discuss the nature and magnitude of error in the Study.

Case Contributions of the Reporting Centers and Methods of Study

In Tables 2 and 3, the total population of the Study is broken down into the number of cases reported by each participating center designated by its reporting code number. Analysis is made of those diagnostic studies likely to yield a specific diagnosis of the vascular lesion, namely, angiography and autopsy; and data are presented on the incidence of follow-up reports on patients who were alive at the time of discharge from the reporting hospital. It may be seen (Table 2) that 86 per cent of the patients in the Study had some type of cerebral angiography. Of these, 80 per cent had bilateral carotid and 16 per cent unilateral carotid angiography. Bilateral carotid together with at least one vertebral or retrograde subclavian angiograms were made in 24 per cent of the cases with angiography, and 27 per cent of the total had some form of vertebral angiography.

At least one follow-up report has been received on 89 per cent of patients who were alive at discharge from the reporting center, and of all cases which died, autopsy was performed in 50 per cent (Table 3).

All but 2 centers contributed well over 100 cases; 5, more than 300, and Center 20 contributed 30 per cent of the total. Early in the course of the Study, Center 23 elected to drop out.

Incidence of Major Diagnostic Categories

The number of cases in each of the major diagnostic categories is presented in Table 4 and subdivided by reporting center. Cases with proven aneurysm or proven arteriovenous malformations (AVM) are tabulated and separated from the small group of patients who harbored both types of vascular lesions. It may be seen that 51 per cent of the

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TABLE 1

*For names of the investigators who participated in the work of the individual centers, see "Contributors and Centers" in the introductory report by Saha et al. in Journal of Neurosurgery, 1966, 25: 779-780.