A NUTRITIONAL STUDY OF NEUROSURGICAL PATIENTS
 WITH SPECIAL REFERENCE TO NITROGEN BALANCE AND CONVALESCENCE IN THE POSTOPERATIVE PERIOD*

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The surgical approach to lesions of the brain necessitates a fracture of the calvarium. Cuthbertson has shown that long bone fractures initiate a catabolic process that keeps many patients in negative nitrogen balance for periods of 10 days or longer. Furthermore, patients with long bone fractures do not in general go into positive balance even on high protein intakes. In contrast to the experience in long bone fractures, the increased nitrogen excretion immediately following extensive abdominal operations can usually be compensated by additions to the nitrogen and caloric intake so that a positive nitrogen balance is possible. Many neurosurgical patients are in a moderately poor nutritional state prior to operation, and this may become critical in the early postoperative period. This study was undertaken to determine the requirements for a positive nitrogen balance in such patients.

METHODS

Twelve patients have been studied. Nine of these had a craniotomy performed; 2, a suboccipital craniectomy, and 1 had a cranial defect repaired with a tantalum plate. Six of the patients were females, and 6 were males. They ranged in age from 15 to 50 years. Before operation 3 patients were confined to bed, 2 were ambulatory but were restricted to bathroom privileges, and 7 were fully ambulatory. None of these 12 patients showed evidence of a serious nutritional deficiency. They were divided into two groups as follows:

Group A—"Control." The patients in this group were fed either by stomach tube or mouth in the manner that had been in general use on the neurosurgical service. Those fed by mouth received the standard hospital diets. The one fed by tube received a mixture consisting mainly of milk and milk powder, containing 100 cal. and 0.6 gm. of nitrogen per 100 ml. The study covered a period of 10 days after operation. No attempt was made to keep the intake at a fixed level, but the amounts actually consumed were carefully recorded.

Group B—"Treated." All the patients in this group received hydrolyzed protein in the form of Amigen. The feedings were taken by mouth in 3 instances and in 8 others given by catheter into the stomach in divided amounts. The number of feedings ranged from 3 to 6

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The regimen was continued for a period of 5 days starting within 24 hours of operation. We attempted to give these patients an intake of 0.3 gm. of nitrogen and 30 cal. per kg. of body weight per day. In those patients who were tube fed this was relatively easy, but in those who took feedings by mouth deviations from the planned intake did occur. Unconsumed portions of the diets were measured and deducted from intake.

The caloric value and protein content of the foods were calculated from standard diet tables. A number of different samples of Amigen were analyzed for nitrogen content and an average value of 12.0 gm. of nitrogen per 100 gm. was used in computing the nitrogen intake when this substance was used.

In all cases in which blood or plasma was given, an aliquot from each unit was analyzed for nitrogen. The caloric value of other intravenous fluids was also taken into consideration in computing the patient's total caloric intake.

The nitrogen output of each patient was determined by analysis for nitrogen of urine, vomitus, and cerebrospinal fluid collected by or under the direction of special nurses assigned to the study. Fecal nitrogen was measured in some cases and estimated in others. Further details of the methods have been reported by Riegel, Koop, Drew, Stevens, and Rhoads.