status associated with alcohol and drug use, emergency CT scanning is strongly recommended, even in the few patients who require sedation or intubation and paralysis to complete the study. His suggestion of placing patients with head injuries under observation for three to four hours seems almost idyllic in view of the environment of the contemporary, overcrowded, understaffed emergency facility. The recent literature[1,2] not only supports our approach to CT imaging in the groups at low-to-moderate risk but also demonstrates that this strategy results in substantial savings.

Although we acknowledge the concern of Schreiber et al. about hyperventilation and the thoroughly discussed dangers of producing ischemic zones in the damaged brain with extremely low partial pressures of carbon dioxide (≤25 mm Hg), it must be emphasized that the induction of hypocapnia (by lowering the partial pressure of carbon dioxide to 26 to 28 mm Hg) remains the key to the initial management of increased intracranial pressure. Their reliance on ventricular pressure monitoring and drainage (popularized by Becker et al.[3]) for the management of cranial hypertension is laudable. After years of using emergency ventricular catheterization, however, we found it difficult to maintain a patent draining system in the acutely injured patient, because of ventricular displacement or collapse. The subdural location offers no therapeutic advantage but does provide adequate intracranial-pressure monitoring and allow easy, rapid placement.

Kantor raises a number of important issues in reference to appropriate fluid management in patients with brain injuries who require major intravascular replacement. This entire area remains controversial.[4] In general, we advise the implementation of the protocols for fluid and blood replacement in hemorrhagic shock recommended by the Committee on Trauma of the American College of Surgeons.[5]

Birbamer et al. are correct in insisting on the superiority of the anatomical and pathological resolutions of MRI over CT, and we compliment them on their development of patient support systems that are compatible with MRI. At present, CT scanning is more than adequate for the emergency imaging of the brain after trauma.

ROBERT J. WHITE, M.D., PH.D.
MATT J. LIKAVEC, M.D.
Case Western Reserve University
Cleveland, OH 44109 at MetroHealth Medical Center

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LORENZO'S OIL AND THROMBOCYTOPENIA IN PATIENTS WITH ADRENOLEUKODYSTROPHY

To the Editor: Adrenoleukodystrophy is a sex-linked disorder in which very-long-chain fatty acids accumulate in all body tissues.[1] For this reason, a variety of diets have been formulated to lower the levels of these acids. One diet includes Lorenzo's Oil, a product that contains 20 percent erucic acid (22:1) and 80 percent oleic acid (18:1). During the past two years, 40 male and 6 female patients have received Lorenzo's Oil according to a protocol calculated to provide 20 percent of daily caloric intake. In 19 of these patients the platelet count has decreased significantly (Table 1).

The degree of thrombocytopenia that developed in some of the patients prompted further clinical and laboratory studies. In 17 other patients (6 of whom had thrombocytopenia), levels of platelet-associated IgG were normal. Platelet-aggregation patterns revealed no uniform abnormality. Clotting studies, including determination of the prothrombin time, activated partial-thromboplastin time, and fibrinogen level, were negative. Tests for D-dimer in undiluted plasma were positive in 2 of the 17 patients, both of whom had thrombocytopenia. Platelet levels of erucic acid were markedly elevated, whereas those of linoleic (18:3) and arachidonic (20:4) acid were reduced. In six patients with platelet counts of 99, 122, 151, 128, 114, and 212×10^9 per liter, there was an inverse correlation between the number of platelets and the percentage of erucic acid in platelets, as well as between the number of platelets and their size. In 6 patients with thrombocytopenia, platelet counts became normal within 2 to 3 months after erucic acid was omitted from the diet; in 22 subjects following a normal diet and in 24 following a triglyceryl oleate diet, platelet counts remained normal for a period of 12 months. A few patients had minor bruising, but there was no clinically important bleeding.

Table 1. Platelet Counts before and after Dietary Treatment with Lorenzo's Oil in 46 Patients with Adrenoleukodystrophy.

TIME	PLATELET COUNT ($\times10^{-9}$/LITER)	
	MEAN ±SD	RANGE
Before diet	251.6±58.7	132–379
After 6 mo	165.3±60.3*	27–317
After 12 mo	160.8±56.8*†	65–282

*P<0.001 for the comparison with the value recorded before the diet (by Student's t-test).
†P = 0.71 for the comparison with the value after six months (by Student's t-test).

Rapeseed oil, some types of which have high concentrations of erucic acid, has been an important dietary source of fat in China and India for centuries, in Germany during and after World War II, and in Canada since 1960. Cardiac lipoidosis can develop in animals fed large amounts of erucic acid.[2] For this reason the Food and Drug Administration has banned the use of oils containing erucic acid from the food supply. Furthermore, a previous report demonstrated that five of seven normal adults had thrombocytopenia after following a rapeseed-oil diet high in erucic acid for 22 days.[3] In contrast, only one of seven normal adults following a rapeseed-oil diet low in erucic acid subsequently had thrombocytopenia.

These observations suggest that strategies for the dietary management of adrenoleukodystrophy requiring the administration of large amounts of erucic acid may be associated with thrombocytopenia and that the erucic acid component of Lorenzo's Oil is the cause of the thrombocytopenia. The

clinical importance of these changes remains to be established. Patients being treated with erucic acid should be followed closely with determinations of the platelet count.

WILLIAM H. ZINKHAM, M.D.
THOMAS KICKLER, M.D.
JANET BOREL, M.S., R.D.
HUGO W. MOSER, M.D.
Johns Hopkins University
Baltimore, MD 21205 School of Medicine

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FOLATE DEFICIENCY TO PROTECT AGAINST MALARIA

To the Editor: Gordeuk et al. (Nov. 19 issue)[1] suggest that iron deficiency may protect against malaria. It does not. Of 101 children with malaria and anemia studied in Kenya, 15 had iron deficiency.[2] The development of malaria was not impaired because plasmodia obtain their iron from hemoglobin in iron-deficient red cells.[3]

Ten of the children in Kenya had sickle cell disease,[2] which, like thalassemia, is usually protective against malaria.[3] They had been taking folate supplements because of the increased need for folate in chronic hemolytic anemias and thus did not have the folate deficiency otherwise common in sickle cell disease. All the children with malaria and anemia had normal serum and red-cell levels of folate, as well as normal serum vitamin B_{12} levels.

We suspected that red-cell folate deficiency is the reason sickle cell disease, thalassemia, and glucose-6-phosphate dehydrogenase deficiency protect against malaria. We produced folate deficiency in 10 rhesus monkeys with a folate-free diet and then injected them intravenously with 10 ml of blood from fellow rhesus monkeys infected with monkey malaria (*Plasmodium cynomolgi*).[4] None had clinical malaria. All the trophozoites in their red cells died a megaloblastic death (a death due to an inability to double their DNA and divide) within 48 hours.

Ten control monkeys fed the same diet enriched with 0.1 mg of folate daily were also given the malarial blood, and all had clinical malaria.[4] Five died; the other five recovered after treatment with chloroquine.

Currently, more than 100 million people worldwide have malaria.[5] More than 1 million die of it annually.[5] Those with concurrent sickle cell disease, thalassemia, or glucose-6-phosphate dehydrogenase deficiency are often taking folate supplements. Our studies suggest such supplements feed the plasmodia and allow them to reproduce.

VICTOR HERBERT, M.D., J.D.
Bronx, NY 10468 130 West Kingsbridge Rd.

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To the Editor: Gordeuk et al. report that adjunctive treatment with deferoxamine accelerated both the clearance of parasites and the resolution of coma in Zambian children with cerebral malaria. We are puzzled by some apparent differences in disease characteristics between the Zambian patients and children with cerebral malaria whom we have studied in an adjacent country, Malawi. The same coma score was used in the two centers to evaluate the level of consciousness.

Gordeuk and colleagues report an estimated median time to the recovery of consciousness of 68.2 hours in their group of 28 patients with deep coma (score, 0 to 2) who received intravenous quinine (10 mg per kilogram of body weight every eight hours), sulfadoxine–pyrimethamine by nasogastric tube early in the course of treatment, and placebo. In 173 Malawian children with coma scores of 0 to 2 who were treated with intravenous quinine (20 mg per kilogram initially, then 10 mg per kilogram every 8 hours), a similar analysis yielded an estimated median time to recovery of consciousness of 24.0 hours. This value is remarkably similar to the estimated median time to recovery (24.1 hours) in the recipients of deferoxamine in the Zambian study. The pattern of recovery of consciousness in the Malawian patients mirrors that seen in the deferoxamine recipients extremely closely. The findings in Zambia seem to be more remarkable for the sluggishness of recovery in the placebo group than for the speed with which consciousness was regained in those treated with deferoxamine.

Geometric mean parasite concentrations were almost an order of magnitude lower in the Zambian study (46,000 per microliter in the 42 patients receiving deferoxamine and 41,500 per microliter in the 41 patients given placebo) than in Malawi (mean, 382,338 per microliter in 233 patients with coma scores of 0 to 4). Gordeuk and colleagues state that densities of parasites were estimated with thick blood smears, or films, only. Thin films are preferable for estimating high-density parasitemias; it may be that the method employed (examination of thick films) underestimated the densities of the parasites. . . .

TERRIE E. TAYLOR, D.O.
College of Osteopathic Medicine
East Lansing, MI 48824 Michigan State University

MALCOLM E. MOLYNEUX, M.D., F.R.C.P.
Liverpool L3 5QA, University of Liverpool
United Kingdom School of Tropical Medicine

The authors reply:

To the Editor: With regard to Dr. Herbert's letter, we did not intend to suggest that iron deficiency protects against malaria. Recent reports indicate that malarial infections in humans are not influenced by iron status[1] and that deferoxamine exerts an antiparasitic effect by chelating parasite-associated iron.[2]

Drs. Taylor and Molyneux provide a previously unpublished value of 24 hours for the median time to the recovery