Familial Idiopathic Intracranial Hypertension With Spinal and Radicular Pain

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Objective: To describe a mother and her 2 sons affected by idiopathic intracranial hypertension (IIH), associated in the sons with root irritation symptom. Unlike the other 4 families reported previously, obesity was not present in our patients.

Design: Case reports.

Setting: Department of pediatrics in a university school of Medicine, Naples, Italy.

Patients: A mother (aged 36 years) and her 2 sons (aged 14 and 9 years) developed IIH at different times. Neuroimaging showed an empty sella in the mother, while IIH was associated with spinal and radicular pain in her 2 sons. The mother and the younger son developed permanent visual loss.

Conclusions: Ophthalmologic follow-up in our patients indicates that IIH is a chronic disease. Surgical treatment should be considered an option.

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DIOPATHIC INTRACRANIAL hypertension (IIH) is a clinical entity characterized by symptoms caused by raised intracranial pressure without structural lesions or neurologic localizing signs. Typical features are increased intracranial pressure, papilledema, normal or diminished ventricular size, and normal cerebrospinal fluid composition.

Intracranial hypertension is labeled as “idiopathic” because it has no detectable cause. Although rare cases have a genetic component, to our knowledge, the occurrence of IIH in successive generations has previously been observed only in 4 families. Here we report a case of familial IIH in a mother in whom neuroimaging showed an empty sella and in her 2 sons who are affected by polyradiculopathy and spinal pain.

REPORT OF CASES

CASE 1

A 36-year-old woman was admitted to the Department of Neurology, University of Naples, Naples, Italy, in March 1991 with a history of headache dating back several years. Two months before admittance to the hospital, the headaches increased in intensity and were occasionally associated with transient visual blind spots. She had no history of menstrual irregularity or obesity and she had received no drugs. There was no evidence of neurologic disorders in her family history. At the time of hospitalization, her weight was 63 kg and her height, 158 cm, and she had severe generalized headache, nausea, muscle weakness, hyperreflexia, and photophobia. Results of ophthalmologic examination showed papilledema, an enlarged blind spot in both eyes, and peripheral field constriction. Visual acuity was normal. Fluorescein angiography confirmed papilledema with dilation of the optic disc capillaries. Findings from all initial laboratory studies (blood cell counts, erythrocyte sedimentation rate, sodium, potassium, calcium, phosphate, blood glucose, magnesium, serum lead, immunoglobulins and complement, serum urea nitrogen, and serum creatine levels, protein electrophoresis proportions, and uric acid, cholesterol, triglyceride, bilirubin, alkaline phosphatase, lactate dehydrogenase, aspartate aminotransferase, alanine aminotransferase, aldolase, creatine kinase, serum iron, transferrin, and ferritin levels) were normal. Results of tests to determine values for free thyroxine, thyrotropin, 24-hour urine for gonadotropins, 17-hydroxysteroids, 17-ketosteroids, luteinizing hormone, follicle-stimulating hormone, prolactin, β-estradiol, progesterone, testosterone, and cortisol were all normal. No abnormalities were seen on Doppler ultrasonography of the supraaortic vessels. Lumbar puncture showed an
opening pressure of 400 mm H2O; cerebrospinal fluid cell count, protein, glucose, and IgG levels and cytologic findings were normal; cerebrospinal fluid viral and bacterial cultures were also negative for organisms.

Magnetic resonance imaging of the brain demonstrated intrasellar arachnoidal diverticulum (empty sella) and normal-sized lateral ventricles and subarachnoid spaces. Imaging also ruled out venous sinus occlusion.

The patient’s headache improved after lumbar puncture and she was treated with glycerol and dexamethasone. The patient was discharged after 22 days of hospitalization with a diagnosis of IIH and treated with acetazolamide sodium and dexamethasone for 2 months. The symptoms progressively regressed and 6 months after being discharged the patient was asymptomatic.

Five years later, on hospitalization of one of her sons (case 3), she underwent an ophthalmologic examination the results of which revealed a slightly swollen disc in the right eye and an enlarged blind spot in both eyes. Visual acuity was 10/20 OU.

CASE 2

In December 1992, when he was 14 years old, the son of the patient described in case 1 began to suffer from headache, nausea, and blurred vision. Results of ophthalmologic examination showed papilledema in both eyes and venous engorgement in the left eye. Computed tomographic scan of the brain showed no sellar or suprasellar abnormalities and normal-sized lateral ventricles and subarachnoid spaces as compared with control subjects matched for age and sex.

Lumbar puncture showed an opening pressure of 350 mm H2O. The composition of the cerebrospinal fluid was normal, and viral and bacteriologic cultures were negative for organisms. Idiopathic intracranial hypertension was diagnosed, and the patient was treated with glycerol and dexamethasone. In February 1993, he was admitted to the Pediatric Department, University of Genoa, Genoa, Italy, for evaluation of headache and backache. His weight was 45 700 kg (10th-25th percentile), and height, 170 cm (75th percentile); there was headache, muscle weakness, hyperreflexia, and spontaneous spinal and radicular pain; he had difficulty walking because of backache. Both optic discs were pale and swollen; there was no hemorrhaging. Visual acuity was normal. Magnetic resonance imaging of the brain and of the spinal cord revealed nothing of note and ruled out venous sinus occlusion. The composition of the cerebrospinal fluid was also normal; viral and bacteriologic cultures were negative for organisms.

Complete blood cell counts, erythrocyte sedimentation rate, electrolyte quantitation (sodium, potassium, chloride, calcium, phosphate, magnesium, and lead levels), and immunoglobulin and complement concentrations were in the normal range. Blood glucose, serum urea, nitrogen, and serum creatine levels, protein electrophoresis proportions, and uric acid, cholesterol, triglyceride, bilirubin, alkaline phosphatase, lactate dehydrogenase, aspartate transaminase, alanine transaminase, aldolase, creatine kinase, serum iron, transferrin and ferritin, and vitamin A levels were within normal limits. Doppler ultrasonography of supra-aortic vessels and transcranial Doppler revealed nothing of note. Blood pressure was normal and electroencephalogram and electrocardiogram showed no abnormalities. The patient was discharged after 23 days of hospitalization. No treatment was prescribed and the patient’s symptoms progressively regressed so that 3 months later, the headache had disappeared and the patient was able to stand and walk. Three years later, visual acuity was 20/20 OU, and the anterior segments, fundus, and color vision were normal.

CASE 3

The brother of the patient described in case 2 was admitted to the Pediatric Department, Second University of Naples in February 1995 at the age of 9 years 8 months for evaluation of headache and lower back pain. Nothing of note was found in the patient’s medical history. He had undergone an appendectomy 1 week before admission to the hospital because of several episodes of epigastric pain moving to the right lower quadrant with nausea and vomiting; findings from rectal examination were normal as were the erythrocyte sedimentation rate and white blood cell count at the time of surgery. The operation showed no evidence of anatomicopathologic alterations. On physical examination he had a weight of 28 kg and a height of 132 cm (both in the 50th percentile), headache, muscle weakness, hyperreflexia, and spontaneous spinal and radicular pain. He was unable to walk because of back and leg pain, which was intolerable in the standing position. Headache increased in severity and was associated with blurred vision, photophobia, and diplopia. Results of ophthalmologic examination revealed bilateral papilledema, an enlarged blind spot in both eyes, and a normal visual acuity. On computed tomographic scan of the brain, no sellar or suprasellar abnormalities were seen; lateral ventricles and subarachnoid spaces were normal in size. Magnetic resonance imaging of the brain showed no abnormalities and ruled out venous sinus occlusion. Magnetic resonance imaging of the spinal cord showed an unusual enlargement of the dural sac (Figure).
Lumbar puncture revealed a recumbent opening pressure of 400 mm H2O. Cerebrospinal fluid cell count and protein and glucose levels were normal. Cerebrospinal fluid viral and bacterial cultures were negative for organisms. Blood cell counts, erythrocyte sedimentation rate, and sodium, potassium, calcium, phosphate, magnesium, serum lead, blood glucose, serum urea nitrogen, serum creatinine levels, protein electrophoresis proportions, and uric acid, cholesterol, triglyceride, bilirubin, alkaline phosphatase, lactate dehydrogenase, aspartate aminotransferase, alanine aminotransferase, creatine kinase, serum iron, transferrin, and ferritin, and vitamin A levels were within normal limits. Immunoglobulins and complement concentrations, blood pressure, and electrocardiographic and electroencephalographic findings were normal, as were thyroid and adrenal cortex functions.

Idiopathic intracranial hypertension was diagnosed, and the patient was treated with dexamethasone intramuscularly and acetazolamide for 2 months. After 5 months of treatment, headache, spinal and radicular pain, and enlargement of the dural sac disappeared. However, 12 months later results of ophthalmologic examination showed an enlarged blind spot, constriction of peripheral fields, and red-green defect in both eyes.

**COMMENT**

Idiopathic intracranial hypertension has been described in several families.6-10 In our patients we found no exogenous agent or common systemic disease entity known to be etiologically related to IIH. Consequently, the disorder could result from a genetic defect. A review of the literature revealed only 4 families with intracranial hypertension in successive generations (suggesting autosomal dominant transmission). Obesity is the only common denominator in these cases.3 The role of obesity in the pathophysiologic characteristics of IIH is not clear. Our patients were not obese and we found no evidence of concomitant diseases, predisposing factors, or exposure to noxious agents. This suggests that other factors are involved in our patients.

Idiopathic intracranial hypertension could comprise an assortment of disorders involving abnormalities of the regulation of intracranial pressure. Raised intracranial pressure can result from increased venous pressure, increased resistance of arachnoid villi to resorption of cerebral spinal fluid, or hypersecretion of cerebral spinal fluid perhaps related to endocrine abnormalities.11

Spinal and radicular pain associated with IIH seems to be infrequent.12-15 Bortoluzzi et al12 attributed a similar case to abnormalities in the major cerebral venous drainage system, which impaired the flow and absorption of cerebrospinal fluid.

The spinal cord appeared to be normal in our 2 patients affected by spinal and radicular pain (cases 2 and 3), but the dural sac was unusually enlarged in patient 3 in whom the symptoms were more severe. When the symptoms regressed, the dural sac was normal in size. Therefore, the spinal and radicular pain in this patient were probably related to elevated cerebrospinal fluid pressure that caused distention of the subarachnoid space surrounding the nerve roots.12 The severe abdominal pain observed in case 3 and in the patient described by Bortoluzzi et al12 could reflect radicular damage.

The incidence of permanent visual loss in patients with IIH varies from 2% to 50%.16 Results of ophthalmologic follow-up in our patients indicate that IIH is not an entirely innocuous disease. The visual damage regressed in patient 2, who was untreated. Patients 1 and 3 who had longer-standing severe disease showed an improvement in clinical findings after pharmacologic treatment. However, results of subsequent ophthalmologic follow-up revealed permanent visual damage in these 2 patients. Our experience and a recent report17 indicate that patients with long-standing severe IIH benefit from more intensive treatment. Last, visual impairment in IIH should be considered an emergency that calls for serial lumbar punctures and consideration of surgical decompression or shunting.

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**REFERENCES**