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Sir,

Ophthalmic features of idiopathic intracranial hypertension

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Idiopathic intracranial hypertension (IIH), also called 'pseudotumour cerebri', is a syndrome characterized by increased intracranial pressure with associated signs and symptoms, but without localizing neurologic findings. Although it is usually a self-limiting condition, some patients may lose their vision. It was not until the 1980s that studies began to document this high incidence of visual loss. Moderate-to-severe vision loss has since been reported in over 50% of patient referral groups.^{1–3} IIH is not a rare disease.¹ Population-based studies have documented annual incidence rates of 1–2 per 100 000 people.⁴ For the high-risk group of obese women in their reproductive age, the annual incidence climbs to 19–20 per 100 000 people.⁴ Important risk factors, including female gender, reproductive age, obesity, recent weight gain, and menstrual irregularities, have also been well documented.

Unfortunately, current knowledge of IIH is largely limited to information gained from Western studies. There has been no study describing the features of Oriental patients. Therefore, the goal of this study is to delineate the clinical course of this disorder with an emphasis on visual prognosis and other associated factors.

Methods and results

We reviewed all cases diagnosed as IIH between 1990 and 2000 in Chang Gung Memorial Hospital. In all, 10 cases met the modified Dandy's criteria. Epidemiological

data were collected according to medical records. Symptoms and a detailed medical history were also recorded. All the patients were examined at the Department of Neuro-ophthalmology at the time of diagnosis and on follow-up visits. Visual acuity was measured using the Snellen chart. An ophthalmoscopic examination was performed on each visit and recorded by photographs. The degree of papilloedema was graded using Frisén's scheme. Grade 0 represents a normal optic disc without swelling, grade 1 represents early disc swelling, and grade 5 means severe papilloedema—a transitional stage towards progressive atrophy. The Goldmann perimetry was performed before July 1991 to evaluate visual field defects. In the following years, automated perimetry, the Humphrey 30-2 programme, was employed. Visual function was determined by both visual acuity and the result of visual field testing using the simplified grading system defined by Wall and George. Visual outcome of each patient was defined according to grading of the worse eye at the last visit. All patients had brain computed tomography (CT) scans conducted to rule out any intracranial mass lesions. They also had blood and cerebrospinal fluid (CSF) tests to exclude other disorders known to cause elevated intracranial pressure. CSF opening pressure was also well documented in each case. Body weight and height were measured at diagnosis. Obesity was defined as a body-mass index (the weight in kilograms divided by the square of the height in metres) of 30 or more.

Of the 10 patients, nine were female (female: male ratio was 9:1). The average age at onset was 34 years (range 22–49 years). The duration of follow-up ranged from 2 to 22 months with an average of 13.1 months. The average BMI was 26.8 kg/m² (range 20.45–32.68). Three patients (30%) were obese. One patient reported a weight gain of 6 kg over 3 months from the onset of symptoms. Four patients had a history of systemic hypertension, among them one had unstable blood pressure. One had iron-deficiency anaemia without replacement therapy at the time of the initial evaluation. One had been taking contraceptive pills regularly prior to the onset of symptoms. One had menstrual irregularity and chronic renal failure. Another patient had endometriosis and received Ladogol (danazol) therapy. However, we could not find any possibly associated medical conditions in four of our patients.

Transient visual obscuration was reported by five patients as the presenting symptom, while another three patients first noted diplopia, and two had blurred vision initially. Six patients (60%) noted headaches, six patients (60%) reported transient visual obscurations, three patients (30%) experienced diplopia, and two patients (20%) noted tinnitus (intracranial noise).

Visual acuity ranged from 20/400 to 20/20 at the last visit. Totally, 75% of eyes had a visual acuity of 20/20 throughout the follow-up period. Only one eye had a visual acuity under 20/200 (Figure 1). Visual field tests were normal in four eyes. Abnormal visual field tests included an enlarged blind spot alone in two eyes, constriction in seven eyes, superior nasal loss in two eyes, inferior nasal loss in two eyes, arcuate defect in two eyes, and inferior altitudinal loss in one eye at initial examination. All eyes improved in visual function during the follow-up periods, except for two eyes. On the last visit, one patient (10%) had severe (blinding) visual loss in one eye, one patient (10%) had moderate visual loss in both eyes, four patients (40%) had minimal or mild visual loss, and four patients (40%) were normal (Figure 2).

Although unilateral or highly asymmetric papilloedema is frequently found in IIH, most of our patients suffer from bilateral and symmetric disc swelling. Most disc swelling regressed at the time of final examination, however, one eye had progressed to disc atrophy with opticiliary shunt development and had the poorest visual outcome.

Brain CT scans were negative for mass lesions in all cases. None of the patients had abnormal ventricular sizes. Lumbar punctures were performed in the neurology department of CGMH. CSF opening pressures were measured in all cases at diagnosis. Seven patients had CSF pressure above 250 mmH₂O and three nonobese patients had CSF pressure above 200 mmH₂O. CSF composition was normal in all cases.

Six patients received diuretics therapy (acetazolamide), two with concurrent oral corticosteroids. One was treated with oral steroids only. In spite of medical treatment, visual function deteriorated in two patients. Both later underwent optic nerve sheath fenestration, and one also received ventriculoperitoneal shunting. After surgery, their visual functions remained stable.

Comment

Although recent studies have reported an average annual incidence rate per 100 000 people of 1–2 for the general

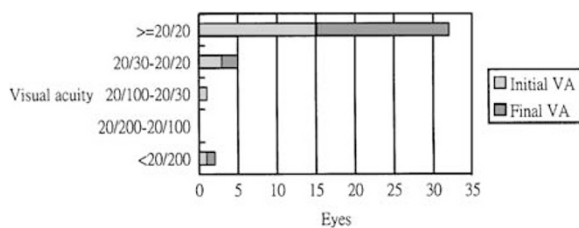


Figure 1 Visual acuity of patients with IIH.

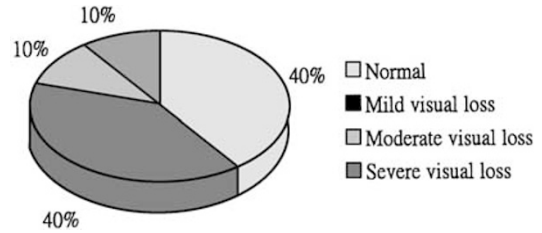


Figure 2 Visual prognosis of patients with IIH. Visual prognosis of our patients with IIH was generally good. Only 20% of the patients had moderate-to-severe visual loss.

population and 19–21 in obese females of reproductive age, the entire IIH population has not been estimated in Asia. In the past 10 years, no more than 60 cases of IIH were documented in Asian countries and most of them were sporadic case reports.^{5–12} With such few case numbers, the true incidence in Oriental people remained unknown.

IIH tends to be a disease of young women with obesity. Many studies showed a strong correlation of IIH with obesity. From 65 to 95% of obesity has been reported accompanying IIH. However, in our study, only 30% of patients were obese. Therefore, other factors may be more important in our series. Female gender and reproductive age were important risk factors in our study as in previous literature. One patient had menstrual irregularity, which has also been proven to have a significant association with IIH. Other possible associated conditions noted in our patients were hypertension, iron deficiency anaemia, chronic renal failure, and medication (contraceptive pills, danazol).

Numerous medical conditions have been postulated to be associated with IIH. Only a few have been proven to actually have a significant association with IIH. Female gender, reproductive age, obesity, recent weight gain, and menstrual irregularities are confirmed in epidemiologic studies. Other possible associated conditions include endocrine disorders (adrenal insufficiency, Cushing’s disease, hypothyroidism), medication (tetracyclines, nalidixic acid, isotretinoin, corticosteroids, danazol), chronic renal failure, systemic lupus erythematosus, etc. Cases that had been reported in Asia were linked to similar conditions, including all-trans retinoic acid (ATRA),^{5,6} nalidixic acid,⁷ eltroxin,⁸ cyclosporin A,⁹ corticosteroid withdrawal,¹⁰ systemic lupus erythematosus,¹¹ and iron-deficiency anaemia.¹²

Since vision loss is an important complication of IIH, close monitoring of the visual function is required. As visual field testing is the most sensitive method for detecting vision loss in IIH, each of our patients has taken serial visual field tests. Either a Goldmann manual

perimeter or a computed automated perimeter was done. The visual field defects found in IIH are the same as those reported to occur in papilloedema as a result of other causes. These so-called 'disc-related defects' are enlargement of the blind spot, concentric constrictions, inferior nasal defects, central, paracentral and cecentral scotomas, arcuate defects, and altitudinal defects. The most common types are constriction and inferonasal loss, and so is the result in our study.

Wall and George³ have developed a grading system of vision loss based on best visual acuity as well as manual and automated perimetry defects. In our study, we utilized this grading system to evaluate visual function of all our patients. All eyes improved in grades during the follow-up period, except for two eyes. On the final visit, one patient (10%) had severe (blinding) visual loss in one eye, and one patient (10%) had moderate visual loss in both eyes. Both of them had a history of hypertension, and were not obese. They were also the oldest among our patients. It may imply that systemic hypertension and older age could play a role in the unfavourable visual outcome. On the other hand, the rest of our patients all had a good visual outcome. In previous literature, moderate-to-severe vision loss was reported in over 50% of referral groups of patients. As a referral group, only 20% of our patients had moderate-to-severe visual loss. Our study demonstrated a more favourable visual prognosis. There may be several reasons for this. One is alertness of patients to the symptoms. Another is close proximity to a medical centre in Taiwan; patients are then likely to receive early diagnosis and therapy. This is probably a factor in the favourable visual outcome of our patients.

In addition to visual field tests, serial ophthalmoscopic exams and fundus photographs may help us to follow the clinical course of IIH. Although a prospective study did not demonstrate any relation between visual field grade and papilloedema grade, one of our patients who had an advanced papilloedema grade did have severe visual loss at the end of the follow-up.

This is the first reported Asian case series of idiopathic intracranial hypertension. It illustrates the nature of idiopathic intracranial hypertension in Oriental patients. Although, because of the small case numbers, we cannot draw a firm conclusion about the better visual outcome and the relationship to obesity, our study is still helpful to understand IIH better.

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