

## Letter to the Editor

# Prognosis of idiopathic intracranial hypertension in Saudi Arabia

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Sir,

Idiopathic intracranial hypertension (IIH) is a syndrome of raised intracranial pressure in the absence of clinical, laboratory, or radiological evidence of intracranial space-occupying lesions.<sup>[1]</sup> Risk factors for IIH include female gender, obesity, and use of certain medications, whereas black race, male gender, and hypertension have been associated with poor outcomes.<sup>[2]</sup> If race influences IIH, there is a need to determine disease outcome in Arabs, among whom few studies have been conducted. Our aim was to document the long-term outcome of IIH in an Arab population.

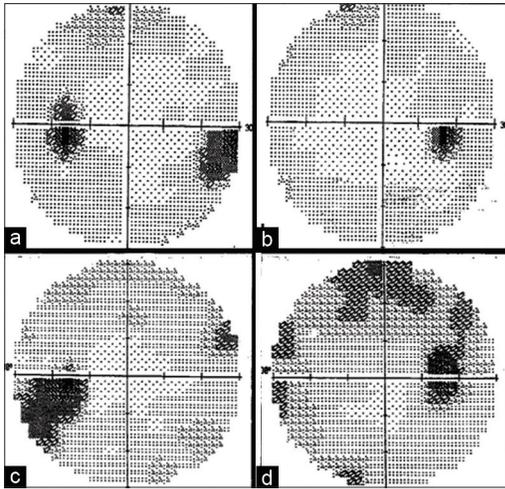
We reviewed all cases of IIH seen at a university hospital in Saudi Arabia between 1989 and 2009. All patients fulfilled the Friedman and Jacobson criteria.<sup>[1]</sup> Data collected included clinical features at presentation, body mass index (BMI), presence of comorbid conditions, and medication use. Brain imaging involved CT angiography and/or MRI venography. Lumbar punctures were performed in the lateral decubitus position. Ophthalmic data collected included visual acuity by Snellen charts, visual fields by Goldmann or Humphrey perimetry, and fundoscopic appearances. Snellen visual acuity was graded in decimals, and then classified according to the following criteria: Blindness was defined as best-corrected visual acuity of  $\leq 0.1$  in the better eye; low vision as best-corrected visual acuity of  $< 0.5$  but  $> 0.1$  in the better eye; and visual impairment as best-corrected visual acuity of  $< 0.5$  in the better eye. Student's unpaired *t* test was used to compare continuous variables, Fisher's exact test was used for categorical data, and binary logistic regression analysis was used to predict visual outcomes. *P* values less than 0.05 were considered significant. Data were analyzed using SPSS for Windows version 16.0 software.

We studied 99 patients (8 males, 91 females; M/F = 1/12). Patients were all Arabs, with age at diagnosis ranging from 12 to 48 years (Mean  $\pm$  SD:  $27.2 \pm 7.5$  years). Weight and height measurements were available for 92 patients only, of whom 80.0% were obese. Of seven patients whose heights were not documented, five were described as obese in their case notes. BMI was higher in females compared with males ( $35.35 \pm 6.44$  vs  $27.33 \pm 6.98$  years; *P* = 0.001), while lumbar punctures revealed opening pressures of 200 to 550 mm CSF (Mean  $\pm$  SD:  $336.34 \pm 92.65$  mm CSF). Ninety-seven patients attended one or more follow-up visits lasting four months to 17 years (Median, 5.2 years; Mean  $\pm$  SD:  $4.3 \pm 3.2$  years).

Thirty-four patients had comorbid conditions, including hypertension (11.1%), depression (11.1%), and bronchial asthma (7%). Presenting symptoms were headaches (97.0%), transient visual obscurations (85.9%), diplopia (23.2%), vomiting (12.1%), dizziness (5.1%), and tinnitus (4.0%). At presentation, reduced visual acuities were noted in 30.3% patients, visual impairment in 19.2%, and blindness in 2.0%. Papilledema was present in 99.0% patients, while a sixth nerve palsy was found in 23.2%, and was bilateral in 6.1%. Of 64 patients who had visual field testing, 67.2% had visual field defects, consisting of enlarged blind spots (46.5%), peripheral constrictions (34.9%), and central scotomas (8.4%) [Figure 1].

Ninety-five patients were treated with diuretics, either acetazolamide alone (39.4%) or combined with furosemide (56.6%), while 27 patients (27.3%) received steroids, in the form of prednisolone (23.3%) or dexamethasone (4%). Seven patients had lumboperitoneal shunt surgery, two of whom had a repeat procedure due to blockage.

At last assessment, 13.1% patients were visually impaired and 2% were blind. We performed a logistic regression analysis, where the dependent variable was visual impairment at last assessment, while the following variables were entered as covariates: Age, gender, BMI, CSF opening pressures, hypertension, diabetes mellitus, visual impairment at presentation, and sixth nerve palsy. Systemic hypertension and



**Figure 1:** Visual field perimetry of two patients with idiopathic intracranial hypertension, obtained with the Humphrey 24-2 SITA Fast program (the left eye is on the left and the right eye is on the right). At presentation, the first patient had an enlarged blind spot and a peripheral defect in the left eye (a) and normal fields on the right (b), while the second patient had peripheral constrictions in both eyes (c and d)

visual impairment at presentation were significant predictors of visual impairment at last assessment, with corresponding odds ratios of 4.6 ( $P=0.045$ ; 95% CI: 2.3-6.8) and 11.0 ( $P=0.001$ ; 95% CI: 6.4-16.7), respectively. Other variables were not significant predictors of visual impairment.

The age, gender, and weight distributions of our patients are consistent with previous reports describing IIH as a disease of young, obese females.<sup>[1,2]</sup> Although a Chinese study<sup>[3]</sup> found no link between IIH and obesity, that study may have lacked statistical power, having enrolled only 10 subjects.

Case reports have associated IIH with iron deficiency anemia, hypothyroidism, polycystic ovary syndrome, and use of steroids, vitamin A, and oral contraceptives, but case-control studies did not find such associations. Our findings are consistent with the latter view, as none of our patients had thyroid disease or polycystic ovary syndrome and only two used vitamin A. Although oral contraceptives were used by many of our patients, the prevalence might not differ from matched controls in the Saudi general population. The prevalence of hypertension and depression among our patients may also not exceed those of similar age groups in Saudi Arabia. At the time they presented, one-third of our patients had decreased visual acuity, 19.2% were visually impaired, and 2% were blind. Following surgical or medical therapy, 87% had excellent outcomes, while the other 13 patients had improved visual acuities in eight and arrested visual loss in four.

Our experience contrasts with those of Mezaal and

Saadah,<sup>[4]</sup> who reported lumboperitoneal shunting in 4% patients and excellent outcomes in 95.2% in Dubai, United Arab Emirates. Perhaps, Dubai being a metropolis, patients there would present to hospital earlier than would those in a vast country like Saudi Arabia. Wall and George reported visual outcomes comparable with ours in a study of 50 patients in New Orleans, where 10% were visually impaired and 4% were blind at last assessment.<sup>[5]</sup>

We conclude that obesity is a risk factor for IIH in Saudi Arabia, where hypertension and visual impairment at presentation are strong predictors of poor outcomes. Public health measures to control hypertension and ophthalmic assessments of patients with headache may prevent visual loss in IIH. When assessing patients with IIH, visual field testing by perimetry may reveal visual impairment in those with normal acuities.

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