

Evaluation of the impact of a normal baseline body mass index on Idiopathic Intracranial Hypertension visual and headache outcomes.

Mark Thaller^{1,2,3}, Victoria Homer⁴, Susan P Mollan^{1,5}, Alexandra J Sinclair^{1,2,3}

1. Translational Brain Science, Institute of Metabolism and Systems Research, University of Birmingham, Edgbaston, B15 2TT, United Kingdom (UK). 2. Department of Neurology, University Hospitals Birmingham NHS Foundation Trust, B15 2TH, UK. 3. Centre for Endocrinology, Diabetes and Metabolism, Birmingham Health Partners, B15 2TH, UK. 4. Cancer Research (UK) Clinical Trials Unit, University of Birmingham, Birmingham, B15 2TT, UK. 5. Birmingham Neuro-Ophthalmology, University Hospitals Birmingham NHS Foundation Trust, B15 2TH, UK.

Contact: a.b.sinclair@bham.ac.uk @IIHDrBirmingham; mark.thaller@nhs.net @MarkHeadache

Introduction

Atypical idiopathic intracranial hypertension (IIH) = cases that do not fit into the classical phenotype of reproductive aged women living with obesity

Normal body mass index (BMI) at presentation is uncommon, potentially with a different underlying mechanism

Treatment is challenging as weight loss is usually recommended for IIH

Aims

Establish the long term visual and headache outcomes in IIH according to their baseline BMI

Investigate if there are any prognostic factors influencing visual and headache outcomes

Methods

Prospective observational cohort study for IIH patients seen at the University Hospital Birmingham (UHB) between 2012 and 2021.

BMI groups were based on the World Health Organisation definitions

- normal BMI – 18.5-24.9 kg/m²
- overweight - 25.0-29.9 kg/m²
- obesity class 1 - 30.0-34.9 kg/m²
- obesity class 2 and above – ≥35.0 kg/m²

Visual outcomes assessed were

- LogMAR visual acuity
- Humphrey visual field perimetric mean deviation (PMD)
- Optical Coherence Tomography (OCT) retinal nerve fibre layer thickness (RNFL), total retinal thickness (TRT) of the optic nerve head and macular ganglion cell layer volume (GCL)

Headache outcomes assessed were

- monthly headache days,
- monthly migraine-like headache days,
- headache severity
- Headache Impact Test 6 (HIT-6) score.

Results



Normal BMI at presentation is rare 3.7%

Surgical intervention rates were lower in normal BMI patients (7%) compared to obesity class 1 (19%) and class 2+ (15%).

	All	Baseline BMI (kg/m ²)			
		Normal 18.5-24.9	Overweight 25-29.9	Obesity class 1 30-34.9	Obesity class 2+ 35+
IIH patients (n)	375	14	44	75	242
Surgical intervention (n)	53	1	2	14	36
Females (n)	370	13	43	75	239
Age (years)	31.7 (9.8), 375	26.5 (6.6), 14	33.5 (13.5), 44	31.0 (9.5), 75	31.9 (9.2), 242
Body mass index (kg/m ²)	38.8 (9.1), 375	22.7 (1.4), 14	27.1 (1.6), 44	32.0 (1.5), 75	43.9 (6.8), 242
Diagnostic CSF opening pressure (cmCSF)	35.4 (9.4), 196	31.4 (5.3), 5	36.7 (8.9), 22	37.0 (13.0), 41	34.9 (8.1), 128

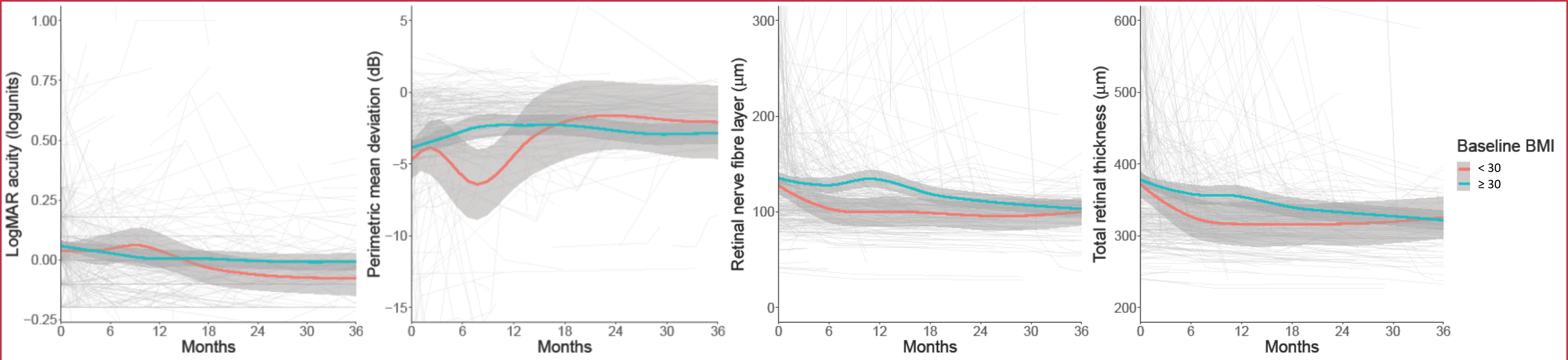


At presentation Humphrey visual fields were worse in the normal BMI group compared to those with obesity.

PMD	Baseline mean (95% CI)
Normal BMI	-8.9967 (95% CI: -12.7581, -5.2354)
Overweight	-4.5161 (95% CI: -6.6363, -2.3958)
Obesity class 1	-2.8149 (95% CI: -4.4375, -1.1923)
Obesity class 2 +	-3.321 (95% CI: -4.2083, -2.4336)

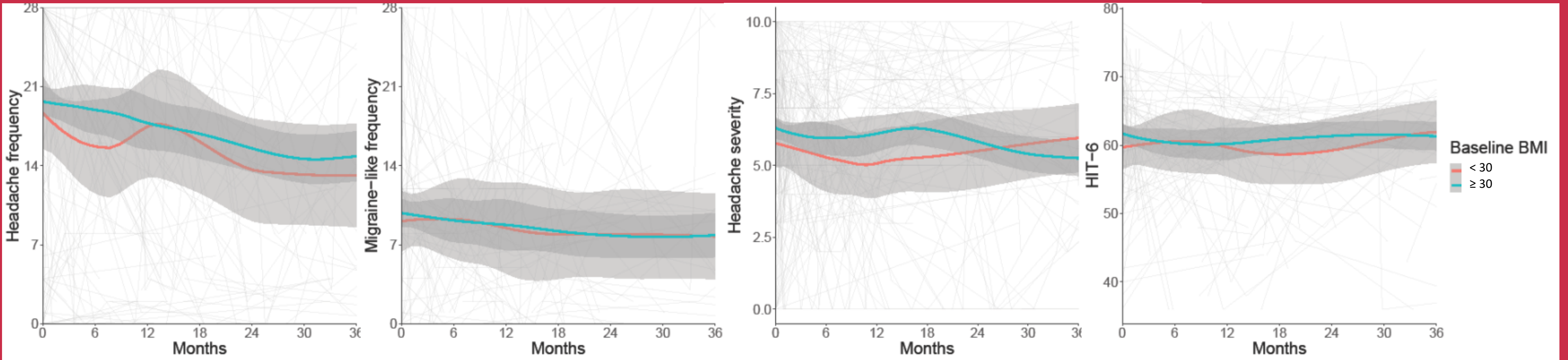
(Visual acuity and papilloedema did not differ at baseline by BMI group)

Visual outcomes comparable between baseline BMI groups.



At presentation headache frequency higher in patients with obesity (BMI ≥30 kg/m²) compared to those with a BMI <30 kg/m².

BMI does not seem to influence headache outcomes.



Discussion

It is important to point out people can get IIH with a normal BMI, although it is uncommon. There could be parallels drawn to secondary pseudotumor as they often have normal BMI (such as astronauts with spaceflight associated neuro-ocular syndrome).

People with a normal BMI appear to have worse baseline fields compared to those with typical disease... more work needs to be done to understand this.

People with a normal BMI appear to have similar visual and headache outcomes to typical IIH patients.