Idiopathic intracranial hypertension: evaluation of births and fertility through the hospital episode statistic dataset between 2002-2020

Mark Thaller[1,2], Jemma Mytton[3], Andreas Yiangou[1,2], James Mitchell[1,2], Olivia Grech[1], Zerin Alimajstorovic[1], Benjamin Wakerley[2], Susan P Mollan[4], Alexandra J Sinclair[1,2]

1. Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, UK.
2. Department of Neurology, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK.
3. Health Informatics, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK.
4. Birmingham Neuro-Ophthalmology, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK

Contact: m.j.thaller@bham.ac.uk @MarkHeadache; a.b.sinclair@bham.ac.uk @IIHDrBirmingham

Background

- Idiopathic intracranial hypertension (IIH) predominantly affects women of reproductive age with obesity
- It is associated with an anomalous and distinct profile of hyperandrogenism.
- Polycystic ovary syndrome is a condition with a similar obesity phenotype and androgen excess that confers an adverse fertility phenotype.
- The effect of IIH on reproductive health is not known.

Aim

- Examine the impact of a diagnosis of IIH on women's fertility rates, on pregnancy complications and method of delivery

Methods

- Data source: Hospital Episode Statistics (HES) database, covering all National Health Service (NHS) Trusts in England.
- Time frame: 2002 - 2020
- Outcome measures:
  - Pregnancies, births and losses (miscarriages and stillbirths).
  - Gestational diabetes and Pre-eclampsia.
  - Delivery method

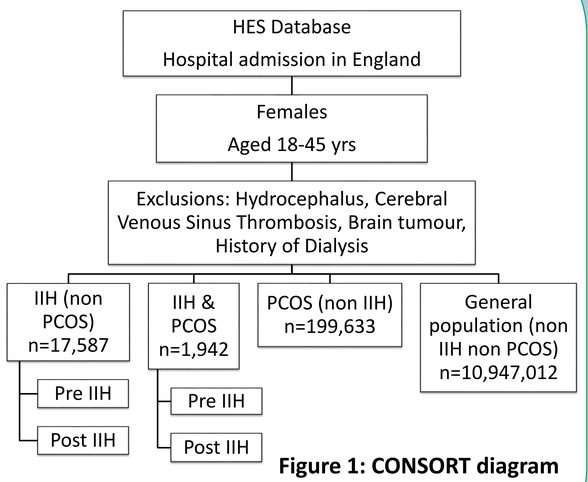

Figure 1: CONSORT diagram

This research is one aspect of my MD with my main involvement in methodology, literature review, data and statistical analysis, and manuscript creation.

Dr Mark Thaller has no conflicts of interest.

Results

Table 1: Baseline pregnancy table

Table 1	IIH		IIH & PCOS		PCOS	General population
	Pre IIH	Post IIH	Pre IIH	Post IIH		
Females aged 18 to 45 years, number	17,587		1,942		199,633	10,947,012
Pregnancies, Number	12,419	7,261	1,262	918	277,067	11,848,846
Pregnancy losses, number (%)	1,017 (8.2%)	548 (7.5%)	160 (12.7%)	98 (10.7%)	35,177 (12.7%)	962,828 (8.1%)
Females with zero pregnancies, number (%)	10,607 (60.3%)	12,774 (72.6%)	1,221 (62.9%)	1,319 (67.9%)	59,860 (30.0%)	4,464,198 (40.8%)
Age at pregnancy, mean (SD)	25.0 (5.1)	28.6 (5.0)	24.7 (4.8)	29.4 (4.9)	29.0 (5.5)	29.6 (5.8)

Figure 2: Impact on pregnancy numbers following an IIH diagnosis **** Chi-squared p<0.0001.

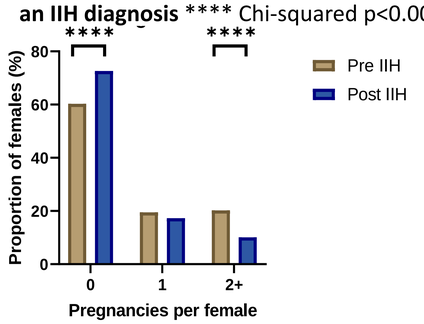

Figure 3: Age specific fertility rate in 2015

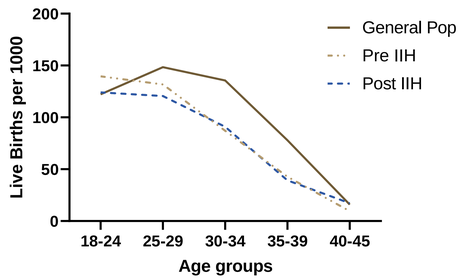

Figure 4: Delivery method following an IIH diagnosis **** Chi-squared p<0.0001.

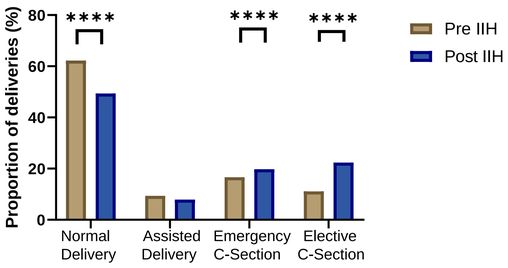

Table 2: Odds Ratio post IIH diagnosis v. General population

Table 2	Odds Ratio	95% CI	P value
Gestational Diabetes	2.67	2.45 - 2.91	<0.0001
Pre-eclampsia	5.26	4.82 - 5.74	<0.0001
Elective C-section	2.39	2.26 - 2.54	<0.0001
Emergency C-section	1.42	1.33 - 1.50	<0.0001

Table 3: Odds Ratio post IIH diagnosis v. PCOS

Table 3	Odds Ratio	95% CI	P value
Gestational Diabetes	1.05	0.96 -1.15	0.2751
Pre-eclampsia	2.97	2.71 – 3.25	<0.0001
Elective C-section	2.02	1.90 – 2.14	<0.0001
Emergency C-section	1.10	1.04 – 1.17	0.0021

- Reduced pregnancies after IIH diagnosis (Table 1, Fig 2)
- Age-adjusted fertility rate lower in IIH patients both before and after diagnosis (Fig 3)
- Probability of pregnancy complications higher in IIH (Table 2 and 3):
  - Pre-eclampsia 5.3 fold higher than general population (non-IIH non-PCOS)
  - Gestational diabetes 2.7 fold higher than general population but similar to PCOS
- Caesarean sections significantly increased post IIH diagnosis (Fig 4)

Conclusion

- Lower fertility rates in IIH patients and reduced pregnancies after diagnosis.
- Increased pre-eclampsia and gestational diabetes risk in IIH.
- Elective caesarean section rates doubled after IIH diagnosis, despite no recommended delivery method in IIH.
- Several factors may contribute to these findings including patient choice and metabolic dysfunction.