Polycystic Ovarian Syndrome in Adolescents: Characterising the Clinical Phenotype and the Role of Precision Medicine

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Introduction

- Polycystic ovarian syndrome (PCOS) is the most common hormone disorder in adolescent and young adult females, affecting 4-20% of the population.
- Historically diagnosed during reproductive years, it is increasingly diagnosed and managed in paediatric and adolescent settings.
- PCOS is poorly understood in adolescents, but has many known adverse associations.

- Early diagnosis can reduce these long-term sequelae.
- However, diagnosing PCOS in adolescents is challenging as clinical signs of hyperandrogenism (acne, increased body hair) and anovulatory cycles and poly/multicystic ovarian morphology are common.

Objectives

- To better understand the clinical phenotype of PCOS in adolescents.
- To plan future discovery (untargeted) proteomic and metabolomic (‘omic’) profiling of urine to identify novel non-invasive biomarkers of PCOS.

Results

- To date, 37 participants have been recruited and 22 have completed their 12 month follow-up (FU).
- Median age at recruitment was 15.0 years (range 12.6-18.3 years).
- Mean age at menarche was 10.9 years (SD 1.38).
- Tanner stage was IV (n=17) and V (n=20).

- Changes from baseline to 12 month follow-up
  - Median FAI significantly improved; baseline 6.7% (IQR 4.6-12.0%), FU 2.6% (IQR 0.5-5.7%), (p=0.002).
  - Prevalence of IFG/IGT fell from 24% (n=9) at baseline to 5% (n=1) at FU.
  - Median fasting insulin concentrations remained unchanged; baseline 153pmol/l (IQR 151-229), FU 157pmol/l (IQR 103-194) (p=0.554).
  - Median BMI centile did not improve significantly; baseline 98.0 (IQR 91.6-99.1), FU 96.5 (IQR 91.9-99.4) (p=0.854).

- Future Directions
  - We are undertaking discovery (untargeted) proteomic and metabolomic profiling of urine, using electrospray-ionisation quadrupole-time-of-flight mass spectrometry.
  - We aim to:
    1. Better understand PCOS molecular pathways.
    2. Identify novel non-invasive biomarkers.
    3. Translate these findings into a clinical useful assay to aid PCOS diagnosis and management.

Conclusions

- PCOS in adolescence is associated with many comorbidities, particularly metabolic disease and mental health disorders.
- As such, accurate diagnosis and early intervention are imperative.
- However, diagnosing PCOS in adolescents remains challenging.
- Current management strategies are limited.

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