

PRESS RELEASE

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Under embargo until 23 May 2022 13:00 CEST

Press release – European Congress of Endocrinology 2022 Abstract OC5.4: Body Composition during Childhood, Adolescence and Adulthood influences the odds of developing Polycystic Ovary Syndrome: A Mendelian Randomisation Study with a Systematic Review and Meta-analysis

Body weight influences the chance of developing Polycystic Ovary Syndrome

A recent study found a clear relationship between obesity and the chance of developing polycystic ovary syndrome (PCOS). The team report obesity during childhood and teenage years are particularly vital to the disease's development. This ground-breaking public health research will be presented during the 24th [European Congress of Endocrinology](#) on 23 May 2022 in Milan, Italy.

PCOS is a common condition. Many cases go undiagnosed, but according to a 2016 study¹ this condition affects **up to 10% of women**. PCOS affects how women's ovaries work and can manifest itself as irregular periods, high levels of "male" hormones and enlarged ovaries with fluid-filled sacs surrounding the eggs². PCOS can lead to diabetes, infertility, poorer quality of life, and pregnancy complications.

The goal of the study was to see if obesity had an impact on the development of PCOS. Dr. Laurence Dobbie, an academic junior doctor at the **Royal Liverpool University Hospital in the United Kingdom**, and Professor Daniel Cuthbertson, Professor of Medicine at the Royal Liverpool University Hospital, investigated whether obesity and diabetes markers contribute to PCOS development with colleagues from the University of Liverpool.

The study included a genetic analysis, termed mendelian randomisation, of over 110,000 people. The team also pooled data from 63 other studies, via meta-analysis, to assess how overweight and obesity affect the chance of developing PCOS.

The study highlighted that BMI, body fat levels and markers indicative of diabetes are vital in PCOS development. They also showed that girls with overweight who go on to have a normal adult body weight are still more likely to develop PCOS. The team also reported that obesity and overweight during adolescence are particularly important in the development of the condition.

¹ <https://academic.oup.com/humrep/article/31/12/2841/2730240>

² <https://www.nhs.uk/conditions/polycystic-ovary-syndrome-pcos/>

"This study shows that obesity during childhood and teenage years are key factors in the development of PCOS. This opens a way to support women's health by investing in nutritional and weight management programmes for younger people. This also has the potential to prevent the condition's consequences which include poorer quality of life, infertility, diabetes and pregnancy complications. Future research should focus on developing new ways to help women affected by PCOS manage their weight", said Dr Laurence Dobbie.

"The team report that girls with obesity who go on to have a normal weight in adulthood are still more likely to develop PCOS. This clearly shows that weight management during childhood is vital to prevent PCOS development. This has the potential improve women's health.", concluded Professor Cuthbertson.

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Notes for Editors

1. The presentation "Body Composition during Childhood, Adolescence and Adulthood influences the odds of developing Polycystic Ovary Syndrome: A Mendelian Randomisation Study with a Systematic Review and Meta-analysis" will be presented on Monday 23 May at 12:50 CEST at ECE 2022 in Milan on the 21-24 May 2022. You can access more information about the congress [here](#).
2. The [European Society of Endocrinology](#) was created to promote research, education, and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators and by any other appropriate means.

About the European Society of Endocrinology

The European Society of Endocrinology (ESE) provides a platform to develop and share leading research and best knowledge in endocrine science and medicine. By uniting and representing every part of the endocrine community, we are best placed to improve the lives of patients. Through the 54 National Societies involved with the ESE Council of Affiliated Societies (ECAS) ESE represents a community of over 20,000 European endocrinologists. We inform policy makers on health decisions at the highest level through advocacy efforts across Europe.

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Abstracts**OC5.4****Body Composition during Childhood, Adolescence and Adulthood influences the odds of developing Polycystic Ovary Syndrome: a Mendelian Randomisation Study with a Systematic Review and Meta-analysis**

Laurence J Dobbie^{1,2}, Sizheng Steven Zhao³, Bradley Pittam⁴, Uazman Alam^{1,2}, Thomas M Barber⁵, Daniel J Cuthbertson^{1,2}

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Background Observational and genetic Mendelian randomisation (MR) data has demonstrated the association of adulthood overweight/obesity with development of polycystic ovary syndrome (PCOS). However, the contribution of early life (i.e. childhood/adolescence) body composition on incident PCOS is unclear. This study determines the influence of body composition on the likelihood of developing PCOS.

Methods We conducted a 2-sample Mendelian randomisation study to determine the impact of body composition and metabolic parameters (fasting serum insulin or sex-hormone binding globulin) on the odds of PCOS. PCOS genome-wide association study meta-analysis data (from 10,074 people with PCOS, 103,164 controls) was interrogated using the inverse-variance weighted method. Furthermore, we conducted a systematic review (71 studies) and meta-analysis (63 studies) of the role of overweight, obesity and central obesity (defined via waist circumference / waist-hip ratio) on odds of PCOS in adults and adolescents.

Results From Mendelian randomisation, significant associations were shown between body composition and odds of PCOS. For every standard deviation increase in BMI (a BMI increase of **4.8kg/m²**), odds of PCOS increased significantly (**OR: 2.76**, 2.27 - 3.35). Similar associations were demonstrated between body fat percentage (**OR: 3.05 per 8.5%**, 2.24 - 4.15), whole-body fat mass (**OR: 2.53 per 9.6kg**, 2.04 - 3.14), fasting insulin (**OR: 6.98 per 0.79pmol/L**, 2.02 - 24.13) and sex-hormone binding globulin (**OR: 0.74 per 28nmol/L**, 0.64 - 0.87). Genetically determined childhood body size increased odds of PCOS after adjusting for adult body size (**OR: 2.56**, 1.57 - 4.20). From meta-analysis, women with overweight (**OR 3.80**, 2.87- 5.03), obesity (**OR 4.99**, 3.74 – 6.67) and central obesity (**OR 2.93**, 2.08 – 4.12) had increased odds of PCOS. For adolescents with overweight and/or obesity the PCOS odds were greater than for adults (adult vs. adolescent: overweight: OR 3.57 and 5.32; Obese: OR 4.66 and 7.86).

Conclusions Using two complementary epidemiological techniques we demonstrate a clear relationship between markers of body composition, indicative of excess body fat accumulation, and odds of developing PCOS, especially in childhood and adolescence. MR reports that genetically determined childhood body composition increases PCOS likelihood independent of adult body composition. From meta-analysis, women with overweight, obesity and central obesity had increased odds of PCOS, with odds even higher in adolescents with overweight and obesity. Overall, this study has implications for the prevention and treatment of obesity and the importance of effective weight maintenance from early years and beyond.