Egyptian Fertility Sterility Society

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Are empirically derived adolescent overweight/obesity phenotypes differentially associated with polycystic ovary syndrome (PCOS) in young adulthood?

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What Is Known Already?

Obesity during puberty and adolescence is postulated to promote the development of PCOS by initiating metabolic and endocrine instability [1].

Previous research examining associations of adolescent overweight/ obesity with PCOS has several limitations:

1- Many studies are cross-sectional and thus fail to determine the temporal relationship between overweight/obesity in adolescence and the development of PCOS [2&3].

2- Women with PCOS are more likely to have visceral adiposity, even when compared to age- and BMI- matched controls [4-6].

3-Rresearch postulates that the development of PCOS is driven by ectopic fat (liver and viscera) [7].

4- Previous literature has reported the importance of genetic predisposition to PCOS development; however, no consensus has been reached on an established genetic marker for PCOS and PCOS runs in families, but how PCOS is inherited remains to be defined [8].

Therefore, not all individuals with overweight/obesity may have the same risk of PCOS, and classifications of overweight/obesity based solely on BMI may be inadequate to capture subgroups at highest risk.

What Is New?

A recent prospective cohort study analyzed data came from 4838 female participants that has followed children aged 9–14 into young adulthood (ages 31–37, with 16 waves of data collection between1996 and 2019.[9] Indicators in the latent class analysis were participants' maternal weight status, disordered eating behaviors, body image weight concerns, depressive symptoms and pubertal timing. The derived obesity phenotypes included: 1- Mothers with obesity 2- Early puberty 3- High weight concerns and 4- Mixed'. Among these participants and female participants without adolescent overweight/obesity.

This study used logistic regression with generalized estimating equations to examine associations of adolescent obesity phenotypes with self-reported PCOS diagnosis after age 19.

This recent study reported that:

1- Participants in all four obesity phenotypes were more likely than participants without overweight/obesity to report a PCOS diagnosis ('mothers with obesity' phenotype: (OR)¼4.50, 95% CI¼2.61, 7.77; 'early puberty' phenotype: OR¼2.51, 95% CI¼1.59, 3.97; 'high weight concerns' phenotype: OR¼2.01, 95% CI¼1.24, 3.24; 'mixed' phenotype: OR¼1.94, 95% CI¼1.33, 2.82). Individuals in the 'mothers with obesity' phenotype had a significantly greater risk of PCOS diagnosis compared to those in the 'mixed' and 'high weight concerns' phenotypes ($P<0.05$).

2-A PCOS diagnosis ('mothers with obesity' phenotype: odds ratio (OR)¼4.50, 95% CI¼2.61, 7.77; 'early puberty' phenotype: OR¼2.51, 95% CI¼1.59, 3.97;

‘high weight concerns’ phenotype: OR¼2.01, 95% CI¼1.24, 3.24; ‘mixed’ phenotype: OR¼1.94, 95% CI¼1.33, 2.82).

Individuals in the ‘mothers with obesity’ phenotype had a significantly greater risk of PCOS diagnosis compared to those in the ‘mixed’ and ‘high weight concerns’ phenotypes ($P<0.05$).

Implications of This Findings:

Among females, the risk of PCOS in young adulthood varied by distinct adolescent obesity phenotypes. Those in the ‘mothers with obesity’ and ‘early puberty’ phenotypes had higher risks of PCOS. It may be beneficial to tailor PCOS surveillance according to these high-risk adolescent obesity phenotypes..

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