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## PREPREGNANCY PHENOTYPE AND PHYSIOLOGICAL CHARACTERISTICS IN PCOS

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**Introduction:** Polycystic ovarian syndrome (PCOS) affects 5 to 10% of women of reproductive age resulting in menstrual abnormalities, hyperandrogenism, infertility, metabolic disturbances and cardiovascular risk. We aimed to examine the subclinical metabolic and cardiovascular features in young women with PCOS.

**Methods:** 118 young women were recruited, with 15 self-reporting a diagnosis of PCOS. Body composition was evaluated by DEXA scan and physical fitness by VO2 max testing. Women were assessed for blood pressure, response to volume challenge, aortic-femoral pulse wave velocity, flow mediated vasodilation, adrenergic response to Valsalva, as well as uterine, renal and cardiac hemodynamics. Complete blood counts, metabolic and lipid profiles were assessed. Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) was calculated as an index of insulin resistance. All studies were conducted during the follicular phase of the menstrual cycle, or following a withdrawal bleed (mean 9.4±3.5 days).

**Results:** There was no difference in age between groups. We identified differences in BMI, total fat and fat distribution, all showing statistically significant increases in PCOS. Renal and cardiac volumetrics, as well as laboratory markers also differed in PCOS (Tables 1). We saw no differences between healthy and PCOS subjects in adrenergic response, plasma volume, blood pressure, vessel compliance in response to volume challenge, uterine blood flow, pulse wave velocity and lipid profile. Angiotensin II, urine sodium and creatinine statistically differed between the two groups. Fasting glucose, insulin and HOMA-IR trended higher in PCOS, although not all significantly.

**Conclusions:** Although our sample size is small, our results suggest that physiology of women with PCOS differs from that of healthy women. These differences may help explain clinical trajectories, both pregnancy related, as well as long term health risks associated with PCOS.

**Table 1:** Demographics of renal and cardiac volumetric, and laboratory markers

	Healthy	PCOS	P value
N	103	15	N/A
Age (years)	31.2	30.1	0.4
Parous (%)	30	70	0.03
Cycle Day (days)	9.3	9.8	0.6
BMI (kg/m <sup>2</sup> )	24.8	30.1	0.003
Android Fat (g)	1919	2902	0.008
Lean Body Mass (kg)	47.7	43.3	0.3
Cardiac Output (L/min)	4.5	5.2	0.23
Uterine Blood Flow (mL/min)	45.3	40.8	0.3
Uterine Index (% Uterine Blood Flow per Cardiac Output)	1.0	0.8	0.01
Small Vessel Renal System Resistivity Index	0.07	0.06	0.28
Small Vessel Renal System Resistivity Index	0.11	0.08	0.04
Hemoglobin (g/dL)	12.5	13.1	0.007
Hematocrit (%)	35.4	37.7	0.009
Uric Acid (mg/dL)	4.3	5.3	0.01
Creatinine Clearance (mL/min)	125.3	146.1	0.017
Fasting Blood Glucose (mmol/L)	6.28	6.29	0.03
Insulin (mU/mL)	4.8	7.9	0.06
HOMA-IR	1.22	1.64	0.1

### Biography

Tendai M Chiware is a Reproductive Endocrinology and Infertility Fellow in Vermont, USA. She attended medical school at the University of Birmingham in the UK. She was a Trainee in the UK and a member of the Royal College of Obstetricians and Gynaecologists. She completed her Residency in Michigan, USA and is board certified with the American Board of Obstetrics and Gynecology. She worked at the Department of Reproductive Health and Research of the World Health Organization in Geneva, Switzerland. Her interests include PCOS, Diminished Ovarian Reserve, Fertility Preservation, Minimally Invasive Surgery, Reproductive Surgery and Global Health. She has presented her work at national and international meetings including, the Society for Reproductive Investigation, and she will be speaking at the European Society of Human Reproduction and Embryology's annual meeting.

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