

# Premenopausal women with PCOS – symptoms and consequences

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# Primary aim

- To provide our young, newly-diagnosed, internet-surfing PCOS patients with relevant information on future reproductive and metabolic complications of their disorder.

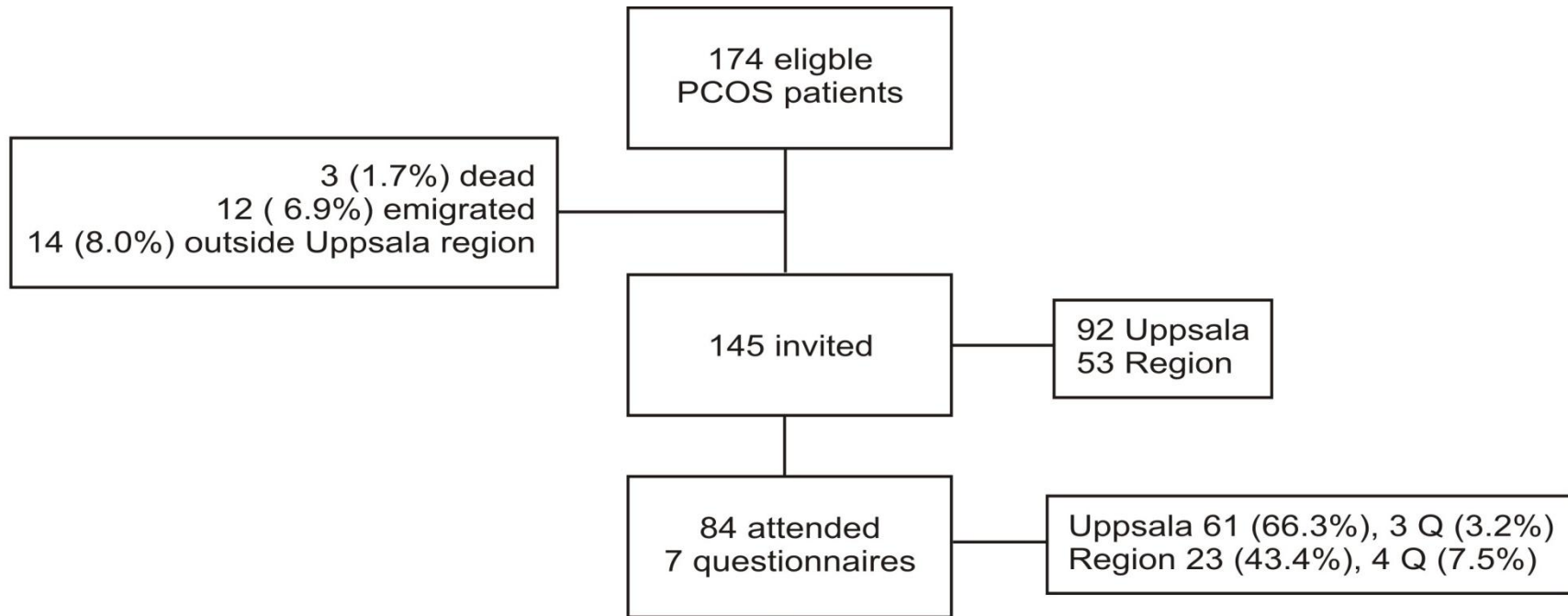


# Patients were not really premenopausal....

- PCOS according to Rotterdam criteria
  - ✿ Diagnosed between 1987-1995
  - ✿ Mean age 43 years (> 35 years)
- Heterogeneous group of PCOS patients
  - ✿ Infertility problems
  - ✿ Hirsutism
  - ✿ Irregular menses
- Age-matched control subjects
  - ✿ Random sample from population registrars



# Study population



- No differences between participating women and non-responders.



# Study population at index assessment

Anovulation  
Hirsutism  
PCO  
44 (52.4 %)

Anovulation  
PCO  
36 (42.9 %)

Hirsutism  
PCO  
4 (4.8 %)



# Study population at follow-up

PCOS  
resolved  
30 (35.7 %)

PCOS  
unresolved  
31 (36.9 %)

PCOS  
not possible  
to determine  
23 (27.4 %)



# Demographic data

	PCOS patients (n = 91)	Control subjects (n = 87)	p
Age, years	43.2 ± 6.0	43.6 ± 6.4	ns
Premenopausal, n	80 (87.9%)	70 (80.5%)	ns
Nordic ethnicity, n	89 (97.8%)	86 (98.8%)	ns
Married/partner, n	68 (74.7%)	66 (75.9%)	ns
Employed, n	65 (71.4%)	81 (93.1%)	0.01
Education, years	13.5 ± 2.9	14.6 ± 3.1	ns
BMI, kg/m <sup>2</sup>	28.4 ± 6.0 <sup>a</sup>	25.7 ± 4.4	0.001
Smoker, n	19 (20.9%)	12 (13.7%)	ns



# Long-term reproductive outcome

- Among women who had attempted a pregnancy, 72 (86.7 %) of PCOS patients and 76 (91.6 %) of control subjects had given birth to at least one child, *ns*.
- Among the PCOS patients who had given birth to a child, 53 (73.6 %) did so at least once following a spontaneous conception.
- 63 (75.9%) had sought care for infertility
- 56 (67.5%) patients had, at some point, been treated for infertility.



# Miscarriages

- PCOS patients  $0.6 \pm 1.1$  miscarriages vs.  $0.6 \pm 0.9$  miscarriages in control subject, *ns*.
- Among women who conceived at least once, 36 (45.6 %) of PCOS patients and 41 (49.4 %) of control women had at least one miscarriage, *ns*.



# Menstrual pattern

- Pre-menopausal PCOS patients without hormonal contraception
  - ✿ PCOS:  $8.8 \pm 3.9$  menstruations during the last year vs. control women had  $11.4 \pm 2.2$ ,  $p < 0.01$ .
- 73.1% had had eight or more menstrual bleedings during the last year was

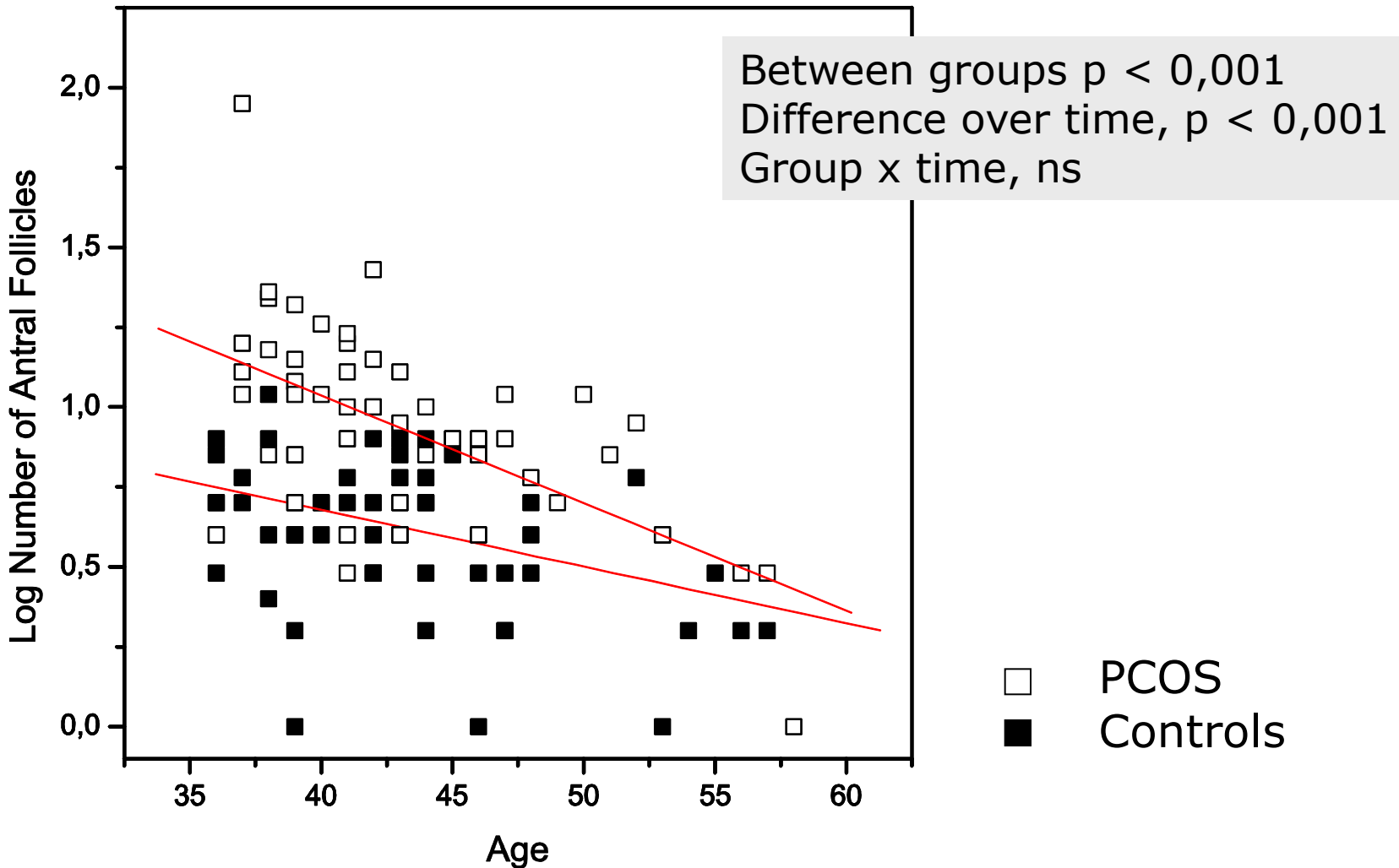


# Ovarian steroids

	Premenopausal women without hormone treatment	
	PCOS (n = 52)	Controls (n = 56)
Age, years	42.4 ± 4.5	41.5 ± 4.6
Ovarian volume, ml	9.5 ± 0.9**	6.6 ± 0.5
Antral follicles, n	11.7 ± 1.7***	5.0 ± 0.3
Estradiol, pmol/l	514 ± 79*	710 ± 90
Testosterone, nmol/l	1.5 ± 0.1**	1.0 ± 0.1
SHBG, nmol/L	50.4 ± 4.5*	64.0 ± 4.8
Free androgen index	5.1 ± 0.8**	2.0 ± 0.2
FSH, IU/L	6.2 ± 1.1*	9.6 ± 1.3
LH, IU/L	7.1 ± 0.7	10.4 ± 1.7
AMH, pmol/l	39.9 ± 6.1***	15.7 ± 2.1

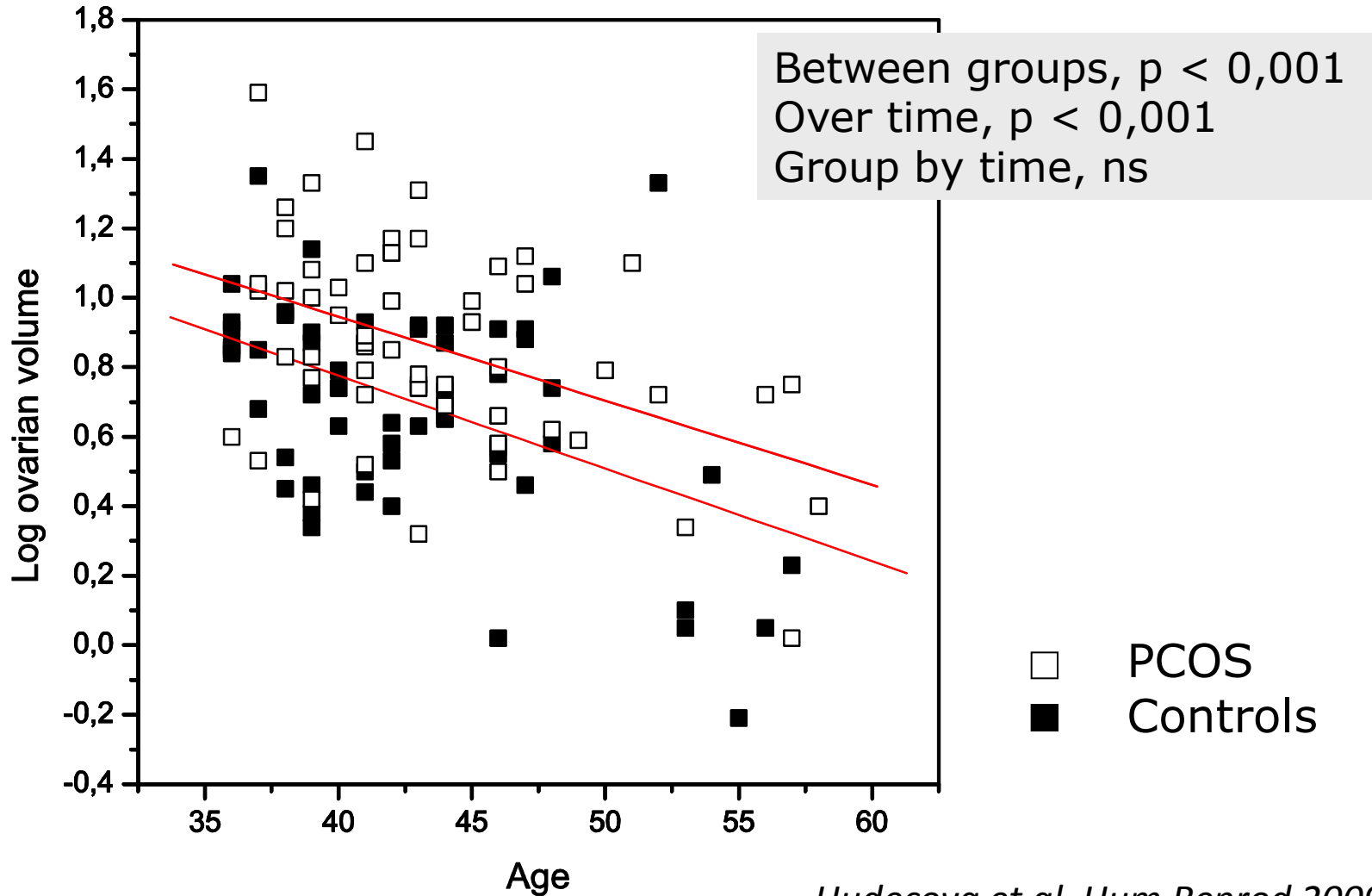


# Ovarian reserve – antral follicles



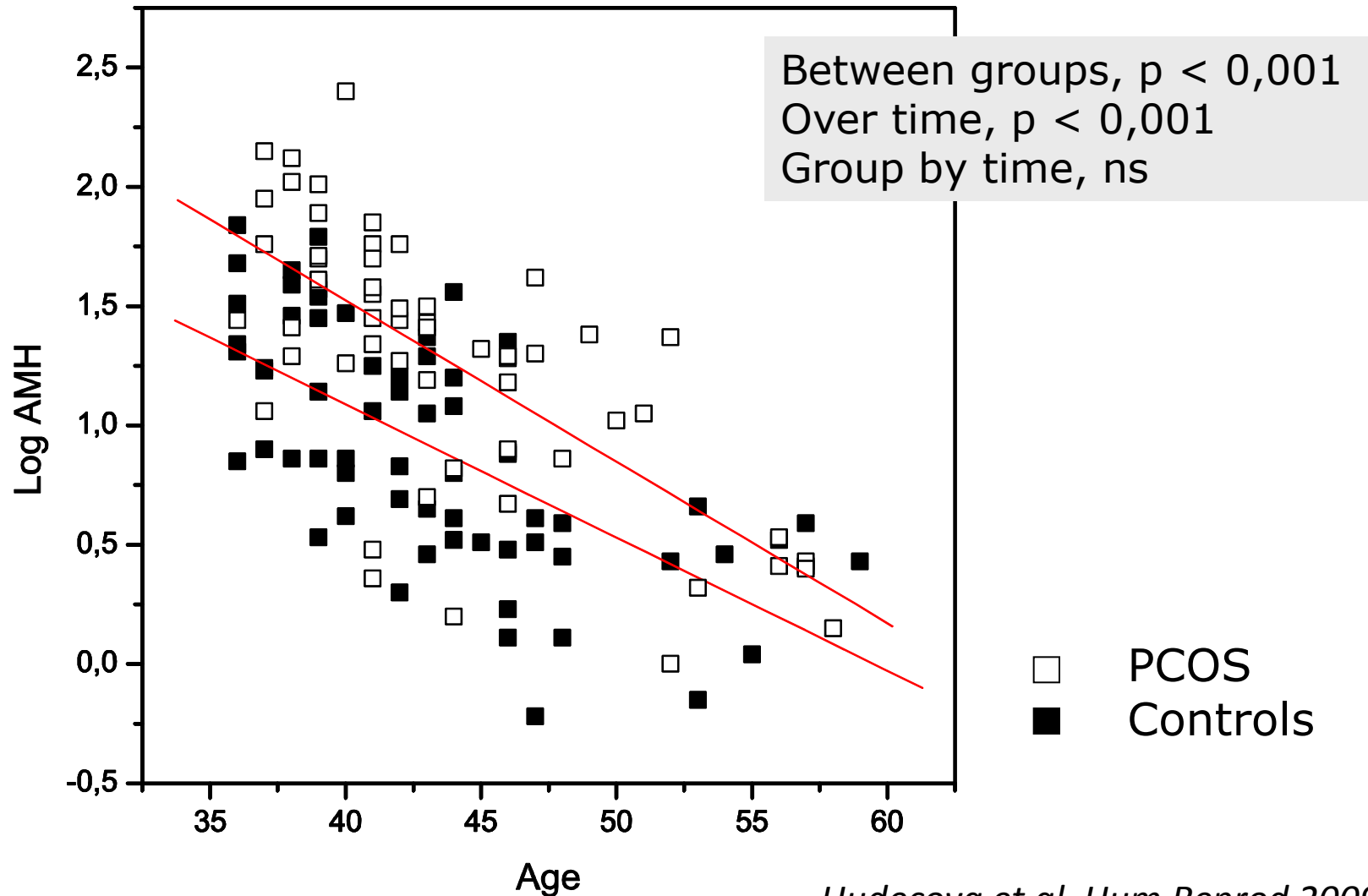


# Ovarian reserve - volume





# Ovarian reserve - AMH





# Change over time

PCOS patients, n = 34

	Index assessment mean $\pm$ SD	Follow-up investigation mean $\pm$ SD
Age, years	25.8 $\pm$ 6.4	42.8 $\pm$ 5.7
BMI, kg/m <sup>2</sup>	26.6 $\pm$ 5.0	28.8 $\pm$ 5.8 <sup>***</sup>
Systolic BP, mm Hg	121 $\pm$ 8	140 $\pm$ 25 <sup>**</sup>
Diastolic BP, mm Hg	76 $\pm$ 11	85 $\pm$ 15 <sup>*</sup>
WHR	0.83 $\pm$ 0.1	0.83 $\pm$ 0.1
Testosterone, nmol/L <sup>b</sup>	2.8 $\pm$ 1.1	1.3 $\pm$ 0.9 <sup>***</sup>
SHBG, nmol/L <sup>b</sup>	24.1 $\pm$ 14.8	45.5 $\pm$ 22.8 <sup>***</sup>
Free androgen index <sup>b</sup>	16.2 $\pm$ 13.2	4.6 $\pm$ 5.6 <sup>***</sup>
MI <sub>60-120</sub> <sup>a</sup>	6.7 $\pm$ 3.4	6.3 $\pm$ 2.6
Baseline insulin, mU/L	10.8 $\pm$ 8.1	9.4 $\pm$ 7.8
Baseline glucose, mg/dL	84.5 $\pm$ 11.2	87.4 $\pm$ 10.5
Insulin peak, mU/L <sup>a</sup>	78.1 $\pm$ 55.7	60.2 $\pm$ 62.0 <sup>*</sup>
Insulin increment, mU/L <sup>a</sup>	67.7 $\pm$ 52.0	51.9 $\pm$ 59.4



# Conclusions

- Most women with PCOS will give birth and the rate of spontaneous pregnancies was relatively high.
- PCOS patients have an ovarian reserve possibly superior to women of similar age
- Free androgen levels decrease over time in PCOS patients but are still elevated compared to age-matched control subjects.