

Hormonal Mechanisms

6.6 Polycystic Ovary Syndrome: Implications of Aldosterone and Progesterone Values in the Different Phases of the Cycle

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Introduction. Recent studies have reported a positive correlation between aldosterone, oxidative stress and metabolic abnormalities in polycystic ovary syndrome (PCOS).

Aim. To measure plasma aldosterone and progesterone during the different phases of the cycle in women with PCOS.

Methods. We enrolled 30 women (15 with PCOS and 15 healthy), matched for age and BMI. Rotterdam criteria were used for the diagnosis of PCOS. None of the patients had hypertension or diabetes or were taking hormones and/or other medications, which could affect the interpretation of the results. All subjects underwent hormonal measurements at the days 7, 14 and 21 of the cycle (aldosterone, plasma renin activity, 17OH-progesterone, testosterone, androstenedione, dehydroepiandrosterone sulfate), C-reactive protein, IL-6, serum sodium and potassium.

Results. Data were analysed considering the following groups: (a) general groups: comprehending all the patients together in the 3 phases of the cycle (PCOS and controls); (b) 2 subgroups: subdividing the patients in relation to their values of progesterone (P) on the 21st day of the cycle: the first group consisted of patients with pg value < 10 nmol/l and the second group included patients with P>10 nmol/l (this cut-off was putatively considered a marker of ovulation). Considering the general groups, aldosterone level was significantly higher ($p < 0.02$) in PCOS women compared with healthy women in all the phases of the cycle. Considering the two subgroups, aldosterone was higher in non-ovulating PCOS compared with non-ovulating healthy women, both in the estrogenic and luteal phases. Progesterone levels between the two groups were not different in all the phases of the cycle. Progesterone/aldosterone ratio was lower ($p < 0.02$) in PCOS compared with healthy women in the estrogenic and luteal phase.

Conclusions. The progesterone/aldosterone ratio can be considered a marker of aldosterone action. An increase in progesterone level in the luteal phase can be considered a protective mechanism against aldosterone action, being progesterone an antagonist at the level of mineralocorticoid receptors. The progesterone/aldosterone ratio is lower in non-ovulating PCOS patients than in controls both in the estrogenic and progestinic phases. It is possible that chronic anovulation or oligo-ovulation is involved in the increased inflammatory action of aldosterone in PCOS due to reduced protection by endogenous progesterone.