



Androgens and erythropoiesis in females: An insight from patients with Congenital Adrenal Hyperplasia

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Introduction

Androgens promote erythropoiesis and have been used for the treatment of anaemia^{1, 2}. Furthermore polycythaemia is a known side effect of androgen therapy³. In Congenital adrenal hyperplasia (CAH), elevated adrenal androgens cause virilisation of female patients. Glucocorticoid treatment reduces androgen levels but there is a difficult balance between excess androgens and suppressed androgens due to excess glucocorticoid treatment.

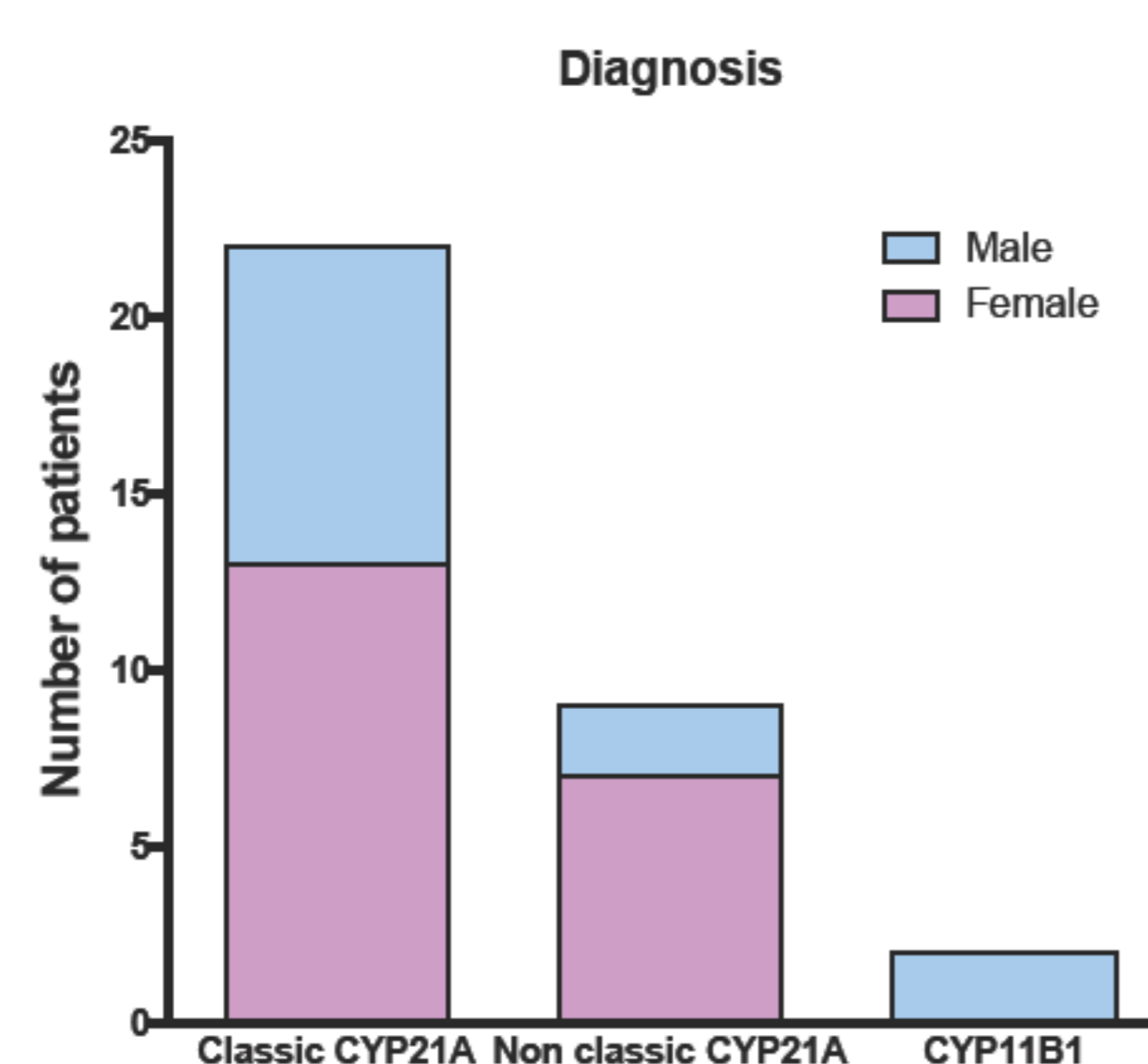
The aim of the study was to investigate the relationship between androgens and erythropoiesis in females with CAH.

Methodology

A retrospective case note review of 63 patients with CAH. Androgen levels and blood counts performed on the same day were collected and analysed in 44 patients; patients with medical conditions known to affect erythropoiesis were excluded.

Results

- Among the 44 patients who were studied 27 were females and 17 were males. Mean age was 35.5±13.2 years.

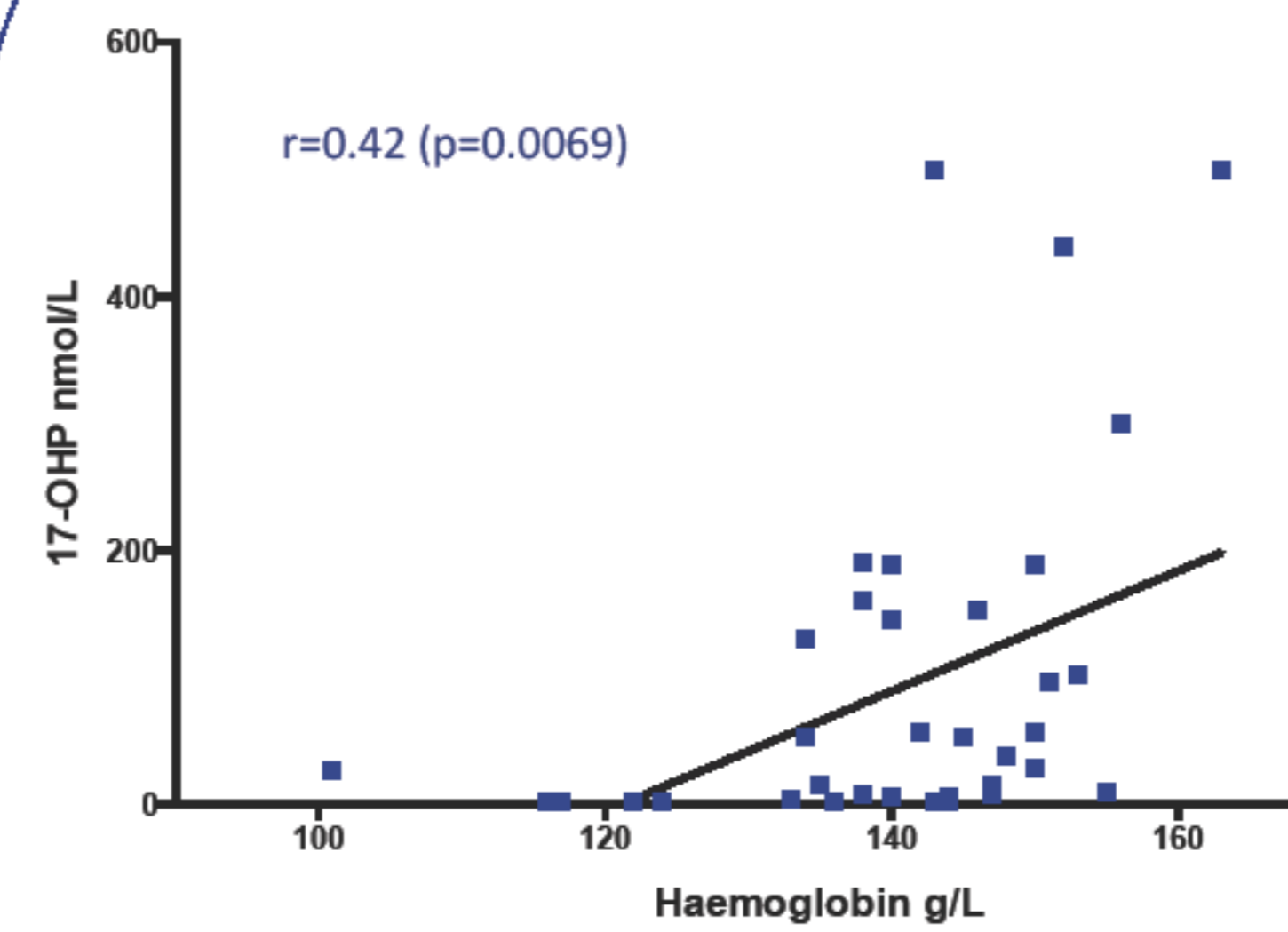


Graph 1 Distribution of diagnosis of CAH

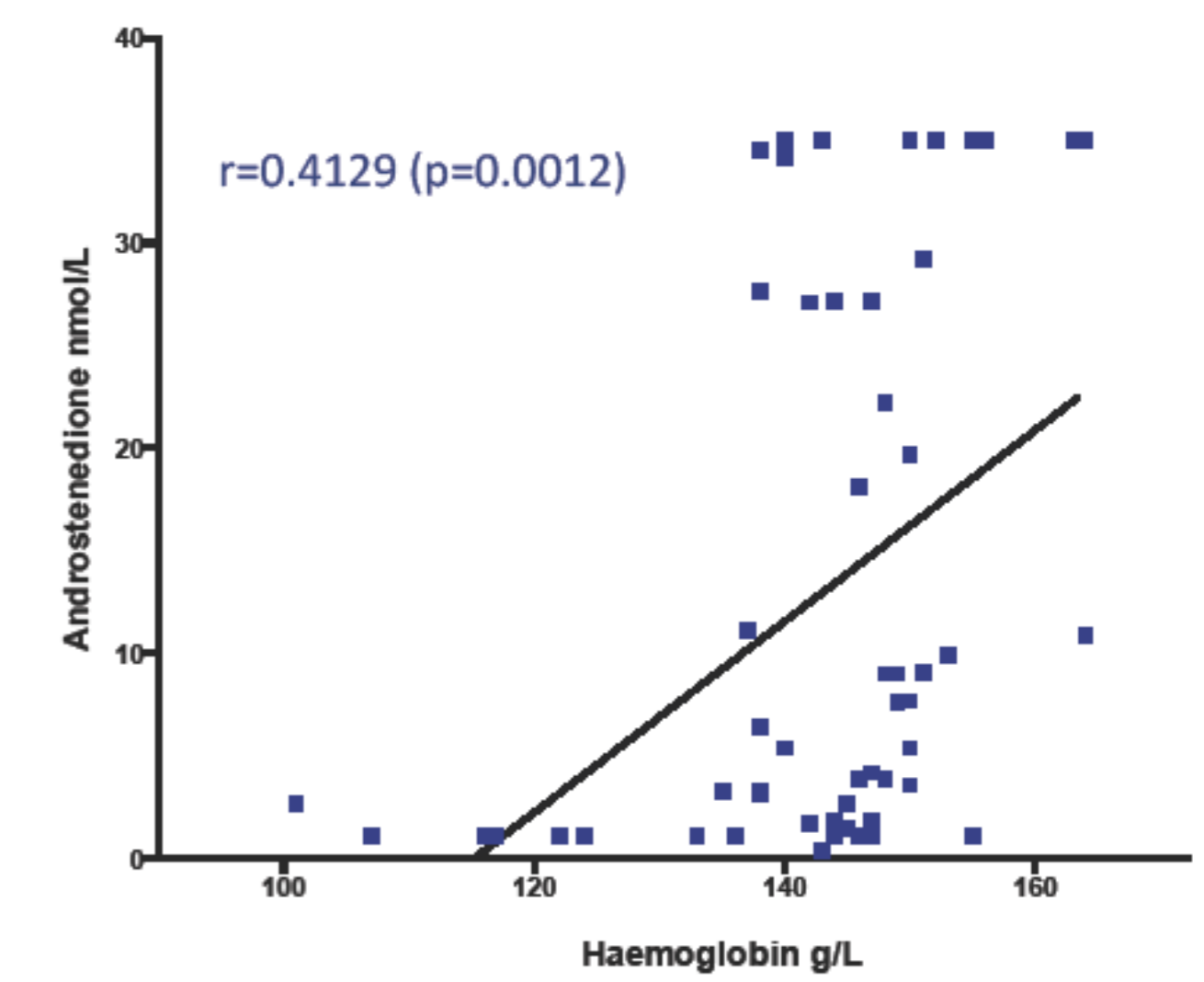
- In women, there was a positive correlation of testosterone, androstenedione and 17-OHP levels with haemoglobin (Hb) and haematocrit (Hct).

	17-OHP	Androstenedione	Testosterone
Hb	r=0.42 (p=0.0069)	r=0.4129 (p=0.0012)	r=0.4442 (p=0.0028)
Hct	r=0.3564 (p=0.024)	r=0.4346 (p=0.0006)	r=0.3673 (p=0.0154)

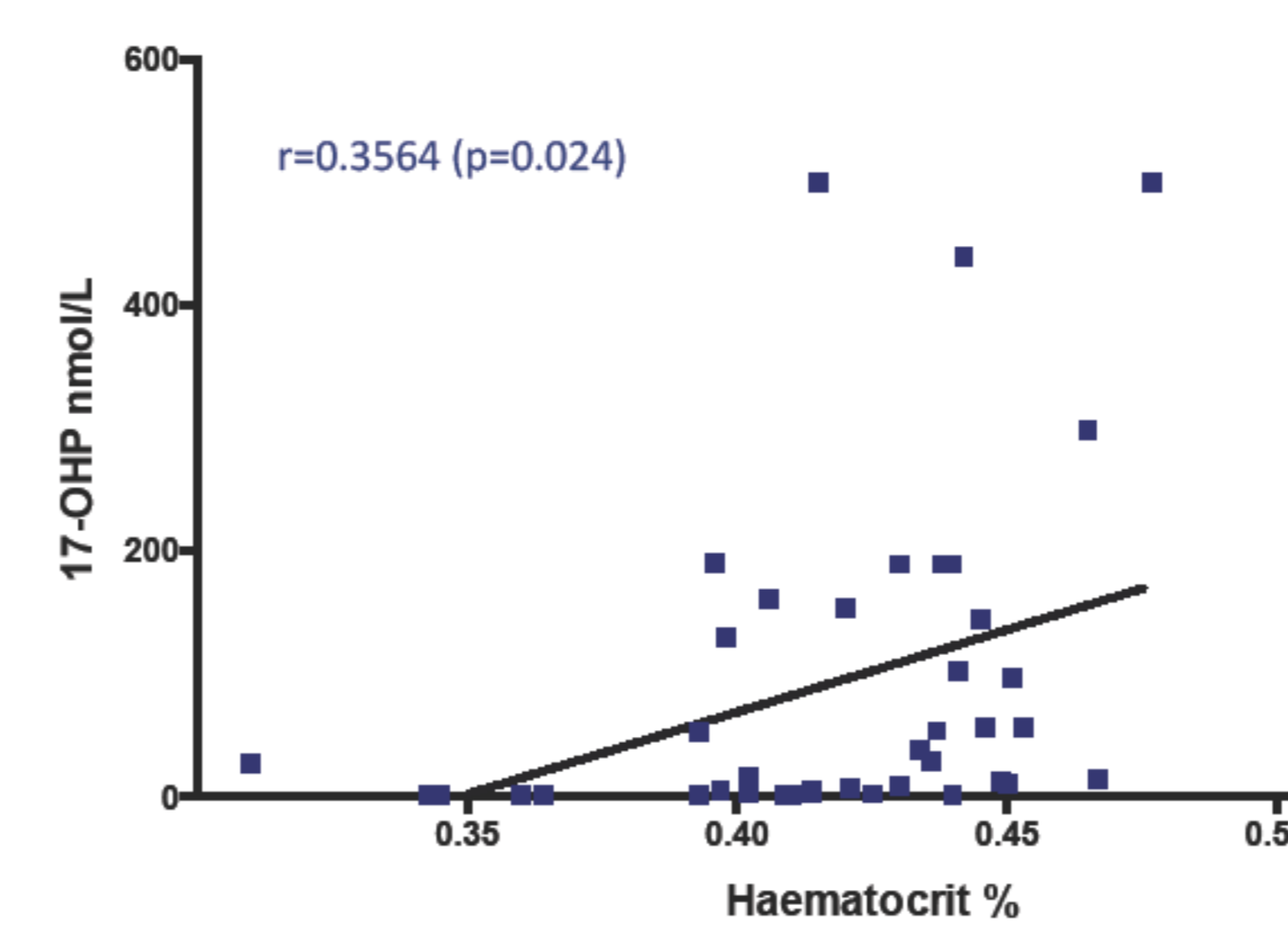
Table: Correlations of Hb and Hct with androgens and 17-OHP in women



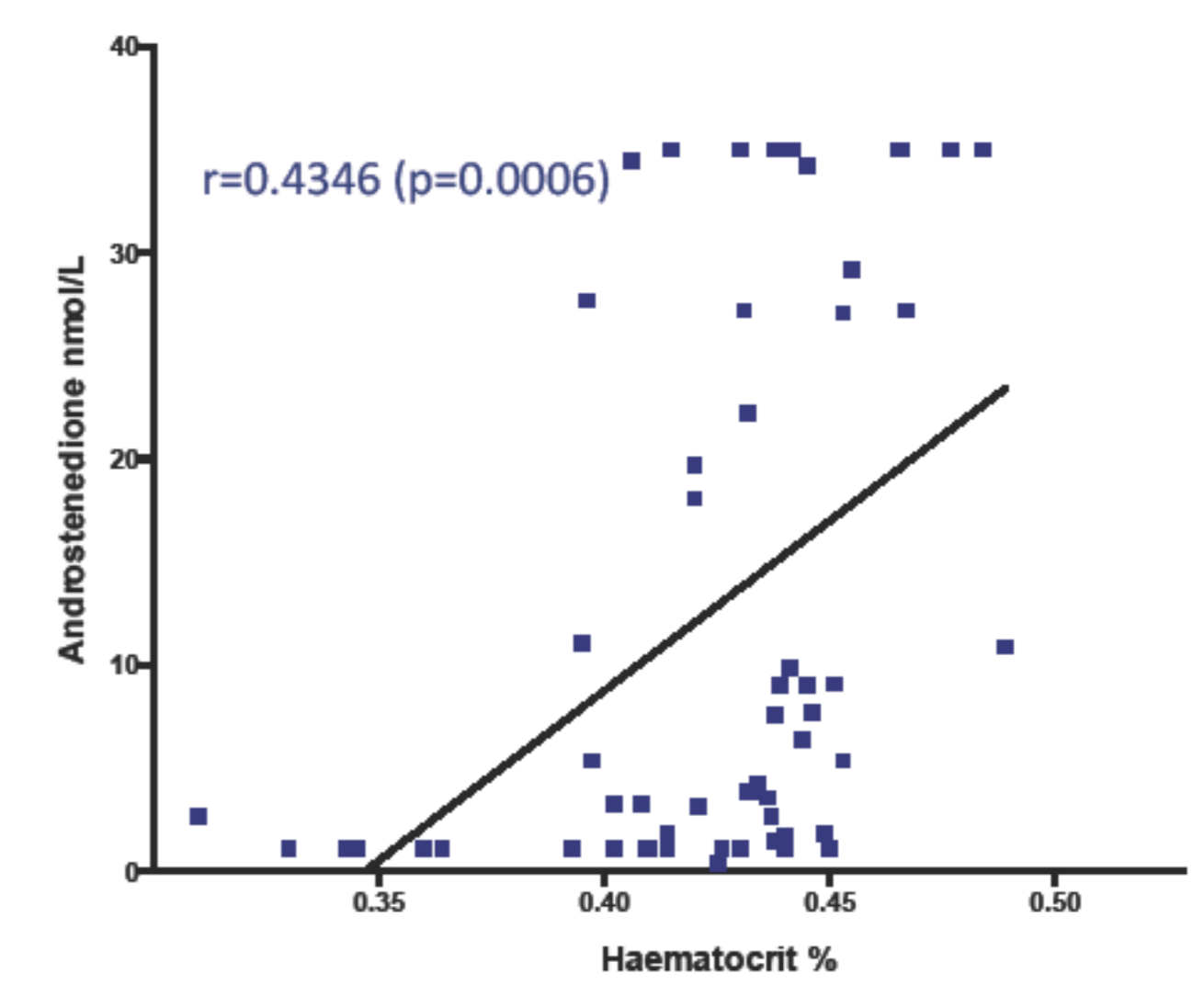
Graph 2 Correlation between 17-OHP and Hb



Graph 3 Correlation between Androstenedione and Hb



Graph 4 Correlation between 17-OHP and Hct



Graph 5 Correlation between Androstenedione and Hct

- There was a difference in Hb and Hct between patients with high, normal and low, androstenedione levels (ANOVA, p<0.01).
- Hct but not Hb was significantly different with high, normal and low Testosterone levels (ANOVA, p<0.01).
- Post hoc analysis showed mean Hb and Hct levels were significantly different between high and low Androstenedione and testosterone subgroups (p=0.001).

Conclusions

- There is a positive correlation between adrenal androgens and erythropoiesis in women with CAH.
- This effect is significant not only at high levels of androgens but also at low levels.
- Suboptimal control of androgens in this group of patients may increase the risk of polycythaemia and anaemia.
- Use of haemoglobin and haematocrit as markers of disease control should be investigated in larger populations of CAH women.

References

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- Marsh, J.C., et al., *Guidelines for the diagnosis and management of acquired aplastic anaemia*. Br J Haematol, 2003. 123(5): p. 782-801.
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