THE CONNECTION BETWEEN SERUM PROLACTIN, TSH AND INSULIN RESISTANCE IN POLYCYSTIC OVARY SYNDROME PATIENTS

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Introduction: both TSH and prolactin serum levels within normal range were previously reported to be associated with metabolic parameters.

Aim: to analyze the connections between serum levels of prolactin, TSH and insulin resistance in polycystic ovary syndrome patients.

Material and methods: 322 PCOS patients (mean age 24.3 ± 5.16 yrs, mean body mass index 28 ± 7.57 kg/m2) with normal serum prolactin and without thyroid dysfunction evaluated between January 2007 and January 2014 were included in the study. Anthropometric, metabolic and hormonal parameters were measured in all the patients. HOMA-IR was calculated as an index of insulin resistance.

Results: HOMA-IR was negatively correlated with serum prolactin ($r = -0,149$, $p = 0.001$) and positively with serum TSH ($r = 0,207$, $p = 0.03$) and with adiposity indices (BMI $p<0.0001$, waist $p<0.0001$, waist-hip ratio $p<0.0001$). In multivariate linear regression both prolactin (beta $= -0.203$, $p = 0.015$) and TSH (beta $= 0.165$, $p<0.05$) were independently associated with HOMA-IR. Several models of multivariate linear regression were built with HOMA-IR as dependent variable and all the parameters associated with HOMA-IR in bivariate analysis as independent variables. In each model one of the adiposity indices (BMI, waist or waist-hip ratios) were included in order to avoid collinearity. In these models the only independent predictor for HOMA-IR was adiposity.

Models of multivariate linear regression with HOMA-IR as dependent variable
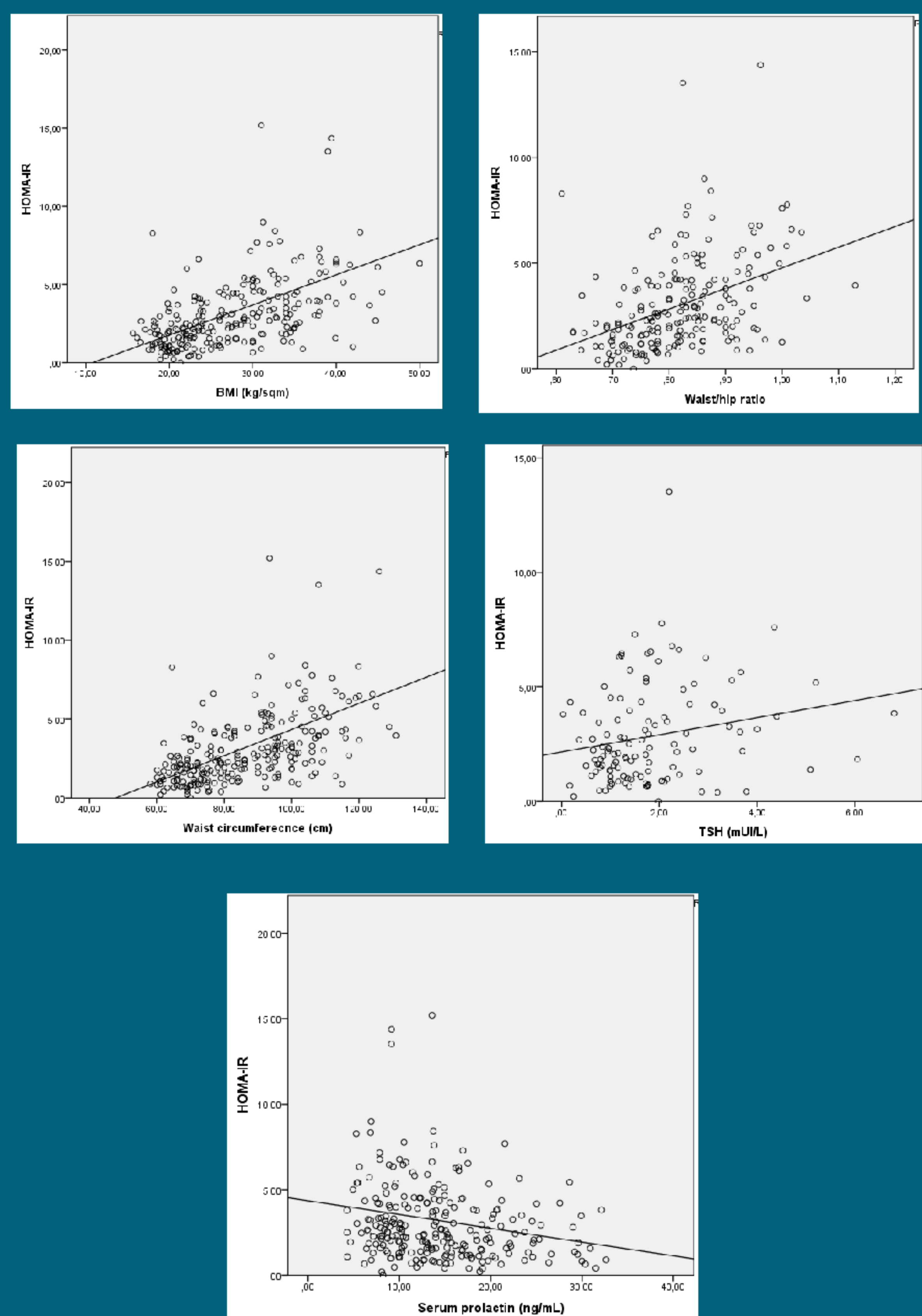
Model 1	B	Std. Error	Beta	P value
Prolactin	-0,036	0,035	-0,094	0,314
Age	-0,039	0,036	-0,099	0,279
Waist/hip ratio	10,553	2,099	0,474	**0,000**
TSH	0,273	0,178	0,136	0,127

Model 2	B	Std. Error	Beta	P value
Prolactin	-0,036	0,027	-0,100	0,183
Age	-0,049	0,030	-0,124	0,103
TSH	0,224	0,133	0,124	0,093
BMI	0,174	0,021	0,615	**0,000**

Model 3	B	Std. Error	Beta	P value
Prolactin	-0,016	0,028	-0,044	0,569
Age	-0,057	0,030	-0,145	0,062
TSH	0,202	0,135	0,112	0,136
Waist circumf	0,075	0,009	0,625	**0,000**

Conclusion: although both TSH and prolactin serum levels were related to insulin resistance, this connection seems to be due to the interplay between adiposity and all these parameters in PCOS patients.