

SERUM GALECTINS ARE INCREASED IN PATIENTS WITH GRAVES' DISEASE HYPERTHYROIDISM

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INTRODUCTION

Patients with autoimmune thyroid disease (AITD) exhibit aberrant immune-regulatory mechanisms. Galectins (Gal) are a family of glycan-binding proteins, which have been involved in immune

regulation. However, the association of Gal with AITD remains unknown. In this study, we evaluated serum Gal-1 and Gal-9 in patients with AITD.

MATERIALS AND METHODS

We studied peripheral blood samples from 31 patients with Graves' disease (GD) (14 with untreated hyperthyroidism, 9 euthyroid with treatment, 8 with iatrogenic hypothyroidism), 26 Hashimoto's thyroiditis (HT) (20 hypothyroid, 6 euthyroid with treatment), 12 non-GD hyperthyroid patients (NG) and 24 healthy controls were studied.

Serum levels of free thyroxine (FT4), TSH, thyroid antibodies (Ab) (anti-thyroglobulin, TgAb, anti-thyroid peroxidase (TPOAb), and TSH receptor antibodies, TSHRab), Gal-1 and Gal-9 were measured on the same day. FT4 was measured by radioimmunoanalysis (RIA); TSH, Tg-Ab, TPO-Ab and TSHR-Ab by immunoradiometric assays; Gal-1 and Gal-9 by ELISA.

Patients were grouped according to clinical diagnosis and thyroidal status.

RESULTS

Serum levels of Gal-1 (ng/mL) (figure 1A) and Gal-9 (pg/mL) (figure 1B) were significantly increased in GD (3.756 and 8.582, respectively), HT (3.085, 9.188) and NG (2.822, 8.983), in comparison to controls (1.508, 7.323), $p < 0.05$. No significant differences in Gal levels were found between the first three groups.

Patients with hyperthyroidism (both GD and NG) had higher Gal-9 levels than euthyroid AITD patients (figure 2), although there were no differences in Gal-1. In fact, in GD, we observed a direct correlation between Gal-9 and FT4 ($r = 0.517$, $p = 0.006$) (figure 3a), and an inverse correlation between Gal-9 and TSH ($r = -0.478$, $p = 0.007$) (figure 3b).

We did not find an association between Gal-9 and Ab levels in either group of AITD, or with the presence of Graves' orbitopathy in patients with GD. Conversely, an association between Gal-1 and TPO-Ab levels was found in HT ($r = -0.512$, $p = 0.038$).

Antithyroid treatment reduced Gal-1 levels in patients with GD (figure 4).

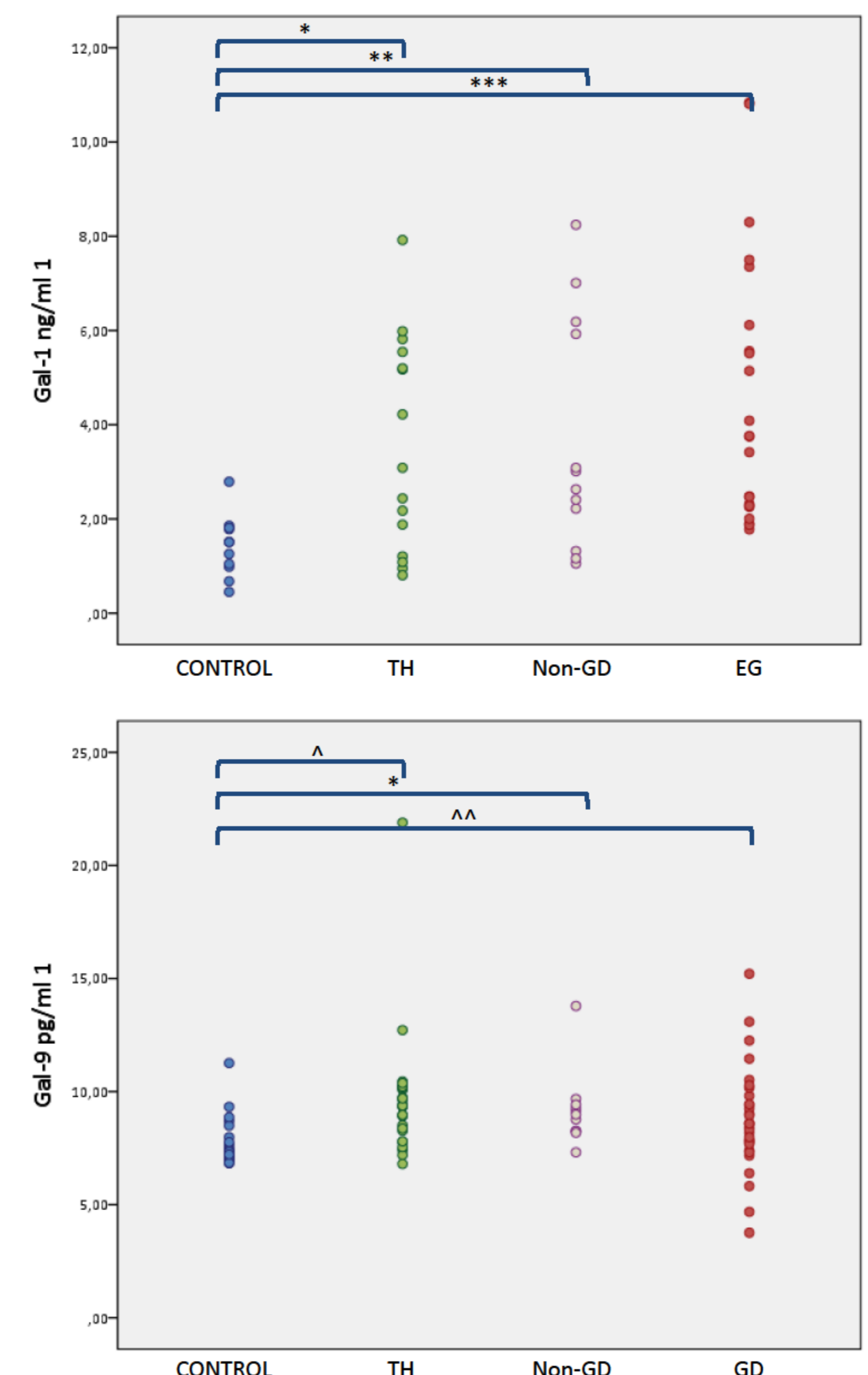


Figure 1. Serum levels of Gal 1 (A) and Gal 9 (B) from patients with HT, GD and non-GD, and controls. Paired comparisons (U-Mann Whitney): * $p = 0.000$; ** $p = 0.013$; *** $p = 0.007$; ^ $p = 0.006$; ^^ $p = 0.001$. Comparison between the 4 groups (Kruskal Wallis): $p = 0.001$ for Gal 1 and $p = 0.000$ for Gal 9.

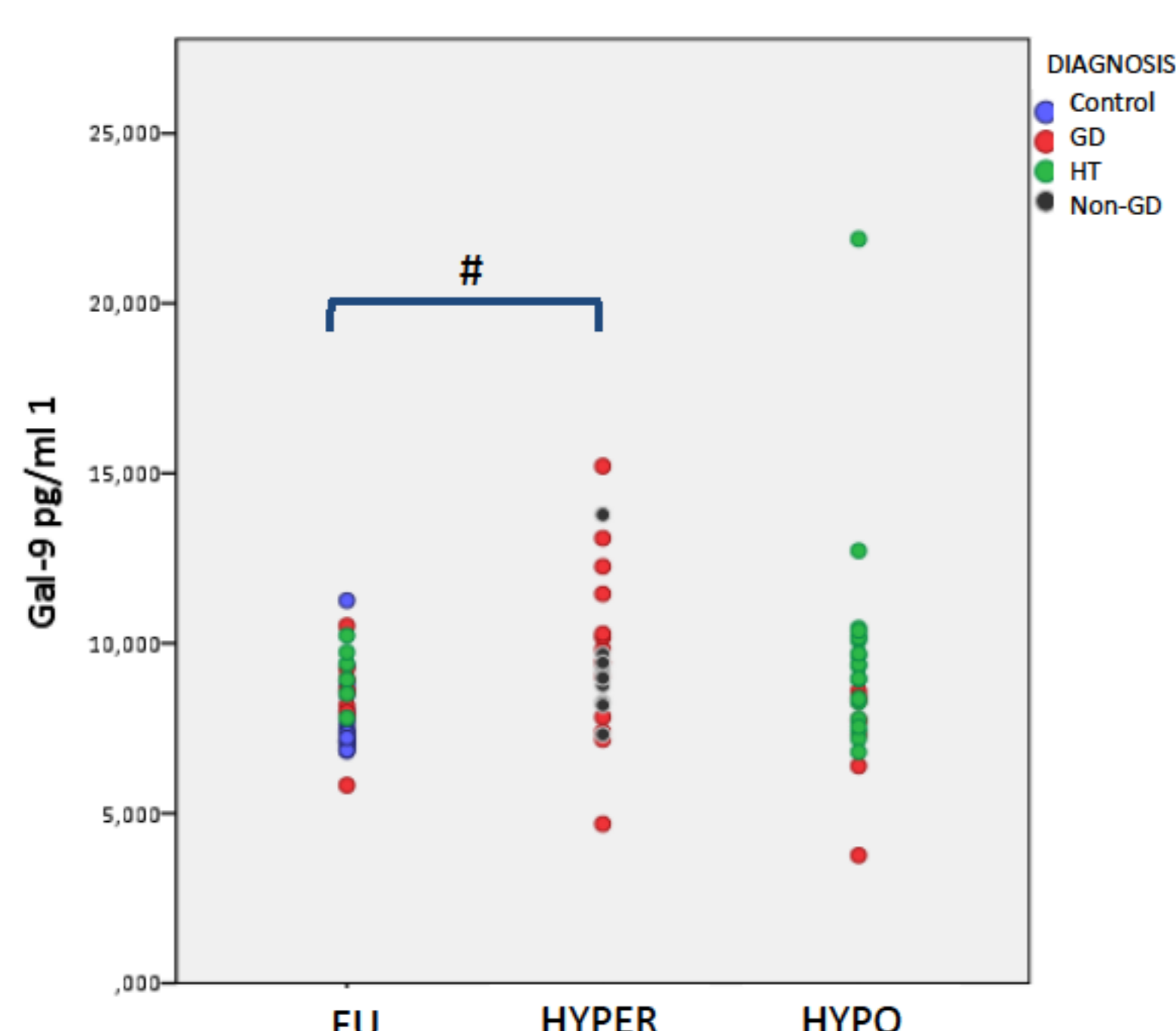


Figure 2. Serum levels of Gal 9 according to biochemical thyroid status. Kruskal Wallis for comparison between the 3 groups $p = 0.004$. Paired comparison EU vs HYPER # $p = 0.001$.

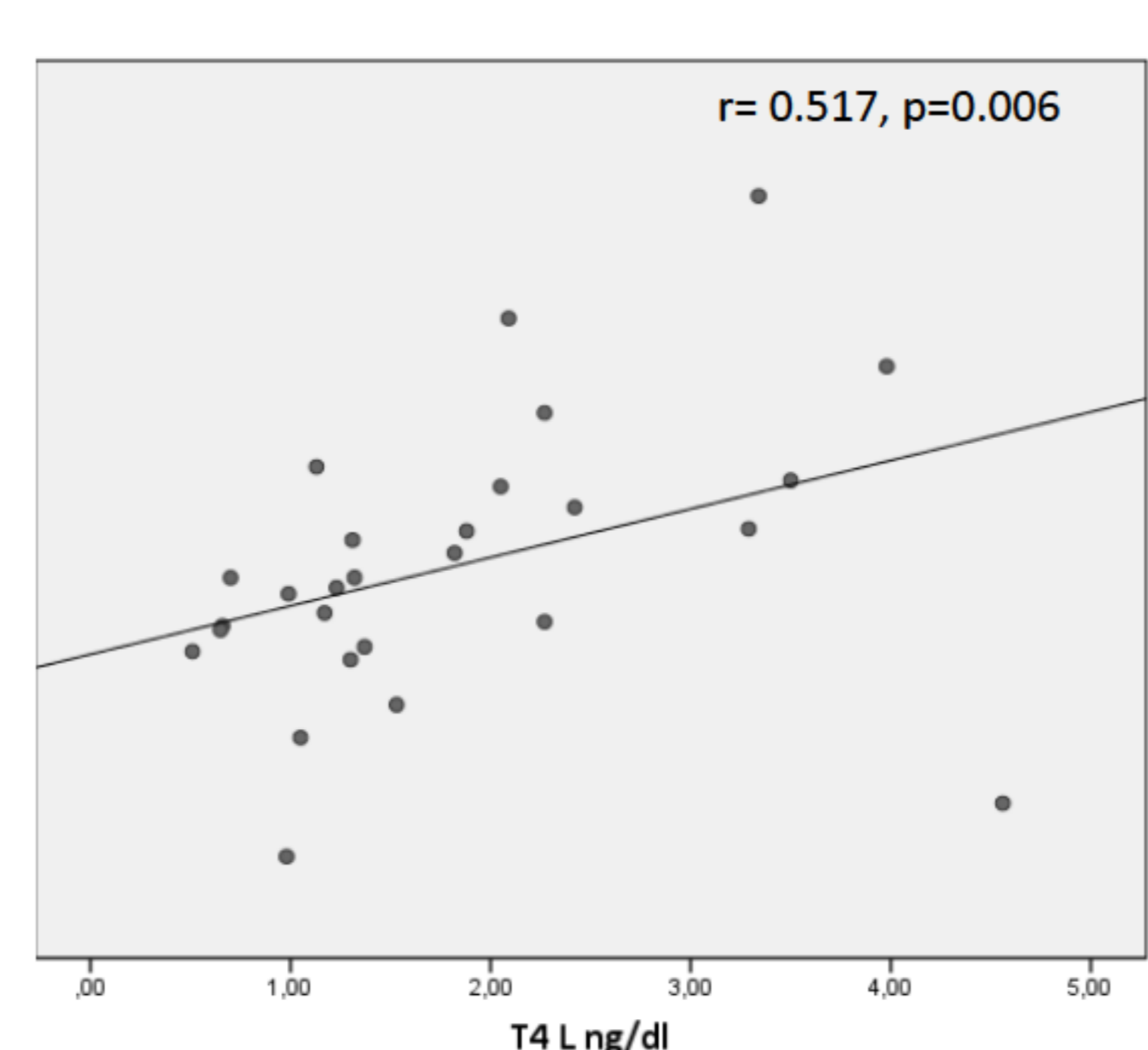


Figure 3. Bivariate correlations (Spearman) of Gal 9 with FT4 (A) and TSH (B) in patients with GD

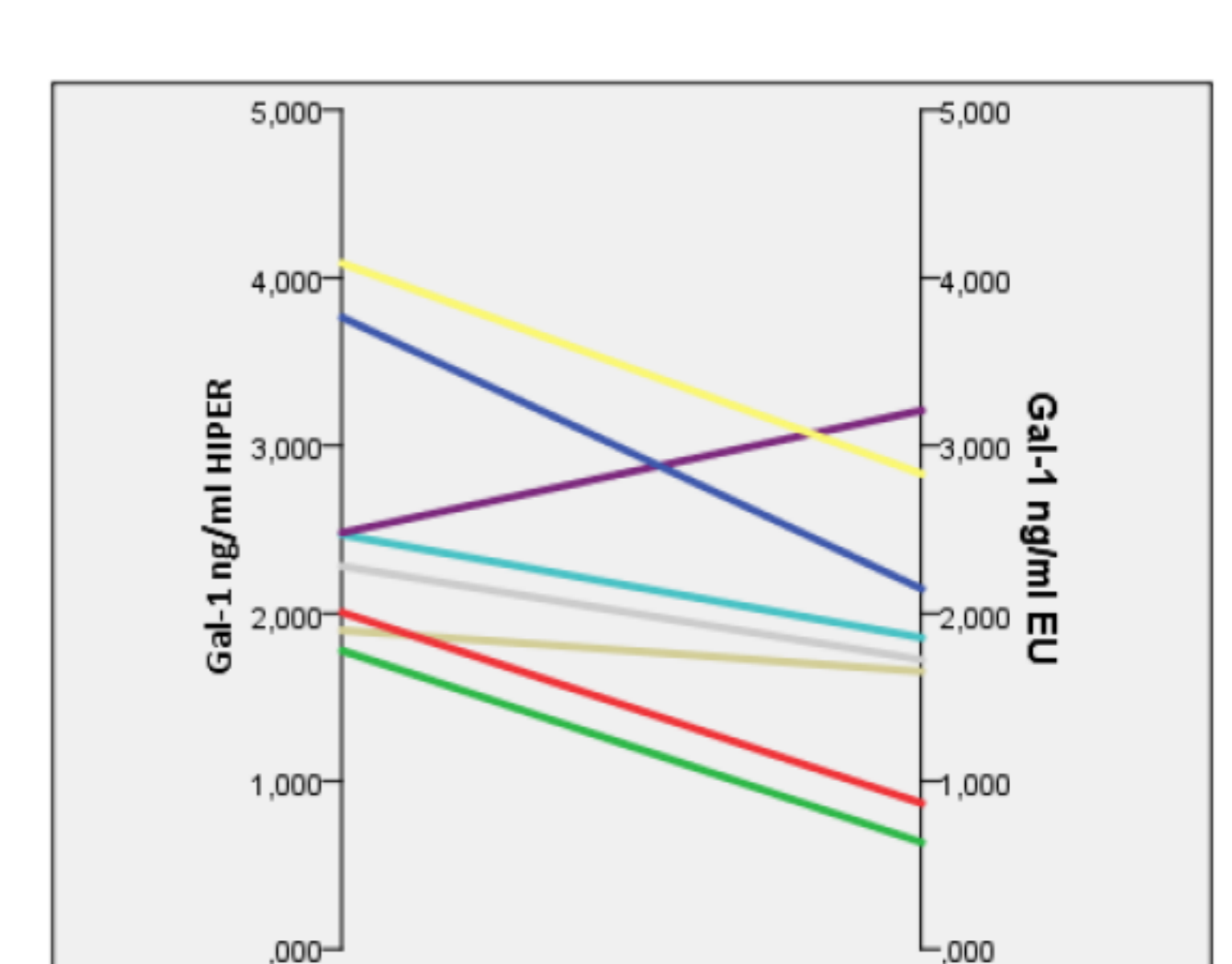
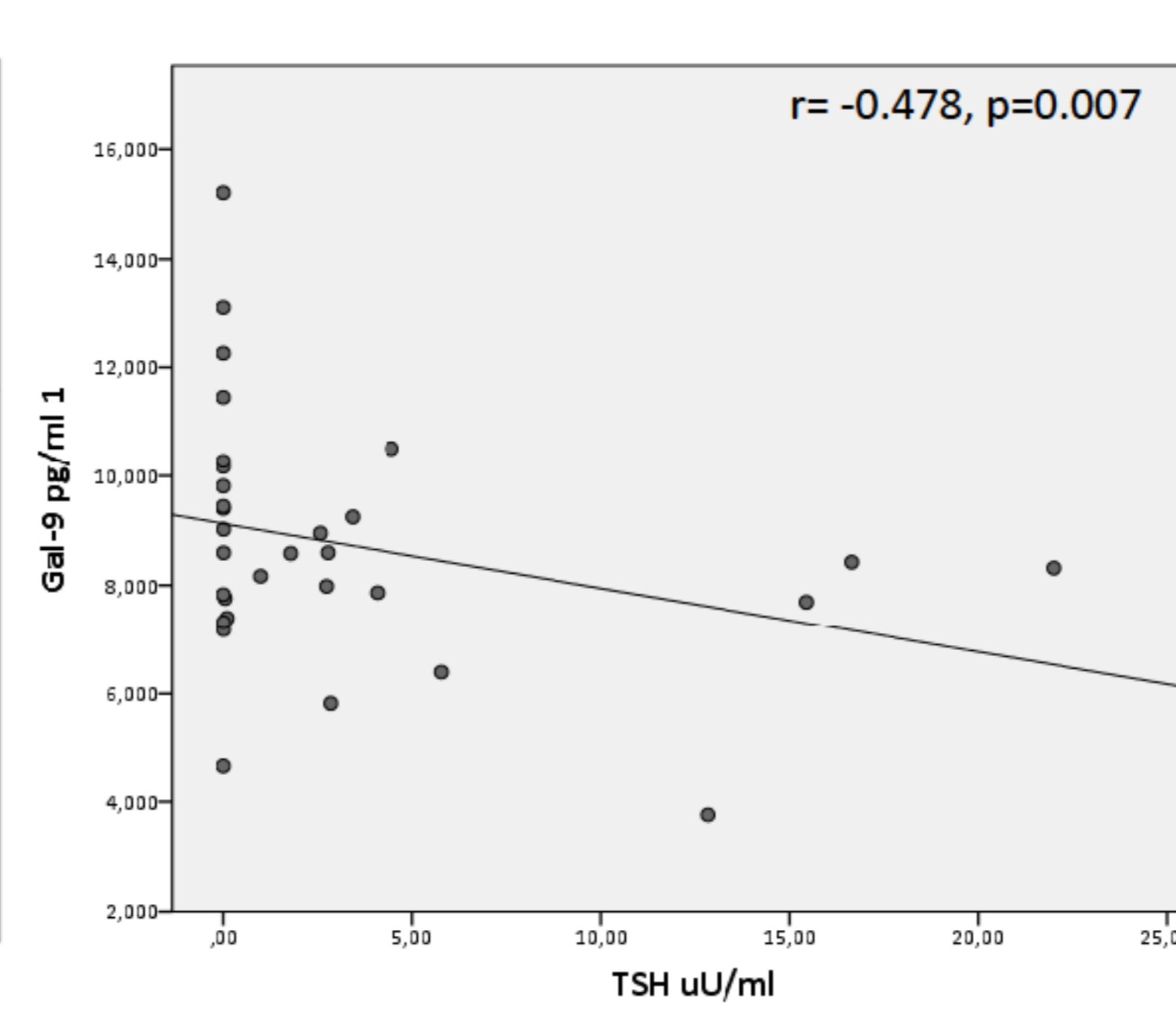


Figure 4. Serum levels of Gal 1 in patients with GD, when in hyperthyroidism (left), and when euthyroid with treatment (right). Wilcoxon's test for related samples $p = 0.05$

CONCLUSIONS

Galectins may be involved in the severity and pathogenesis of AITD, and could potentially be used as a diagnostic and therapeutic marker.

