

# Clinical management of childhood hyperthyroidism: A longitudinal study at a single center

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**Background:** The approach to clinical management of Graves' disease (GD) is debatable. This study aimed to identify predictors of remission in pediatric GD.

**Methods:**

- ✓ A longitudinal study of 36 children and adolescents with Graves' disease followed from 1997 to 2017 at a single pediatric tertiary hospital was performed.
- ✓ Information on clinical and biochemical parameters and treatment with anti-thyroid drugs (ATD) or definitive therapy [radioiodine (RIT) and thyroidectomy] was gathered, with remission being assessed as the main outcome.
- ✓ Analysis was performed using multivariable logistic regression to identify likely predictors of remission, and a Kaplan-Meier survival curve was made to compare outcomes between groups.

**Table 1: Clinical variables and main outcomes comparing patients with GD and GD with Down syndrome.**

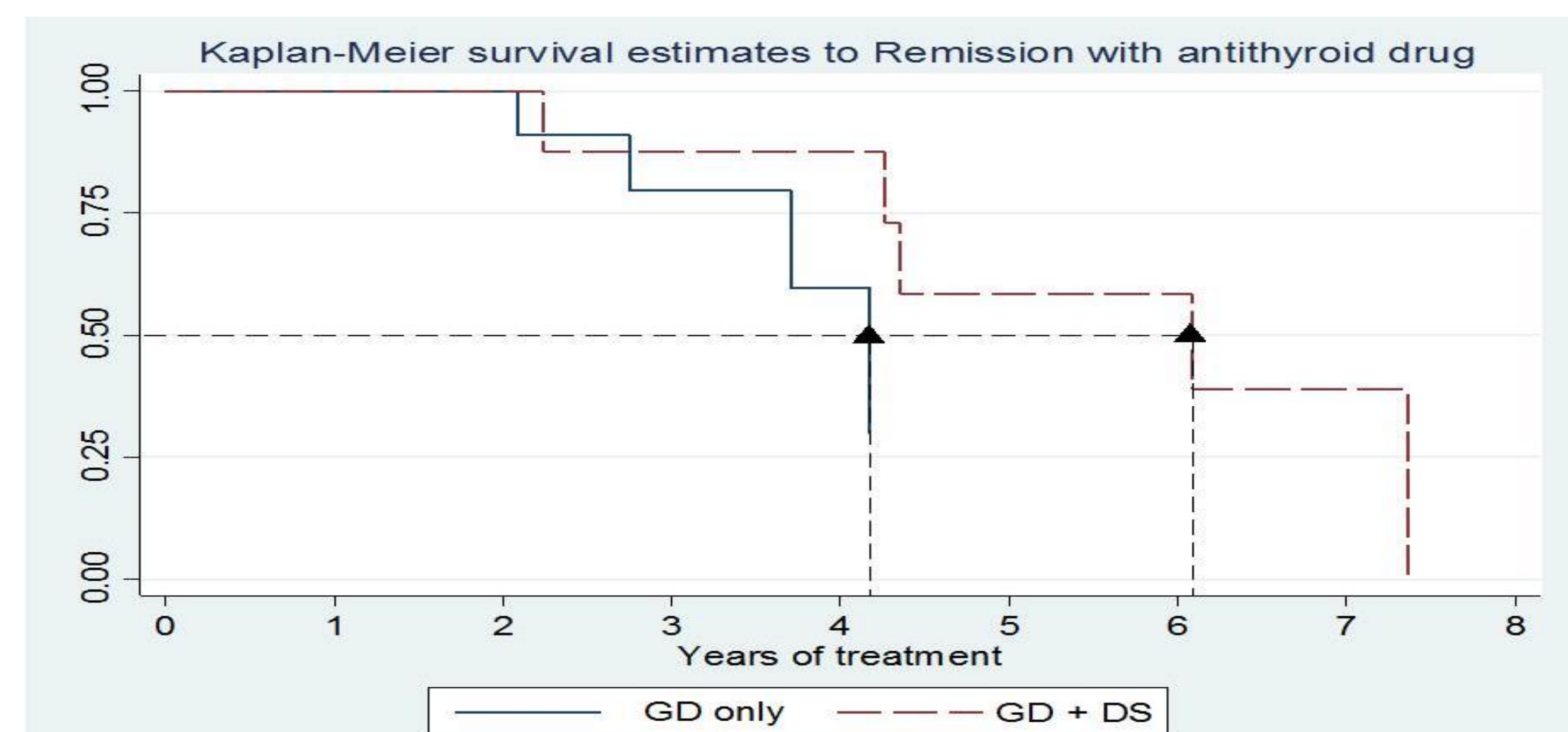
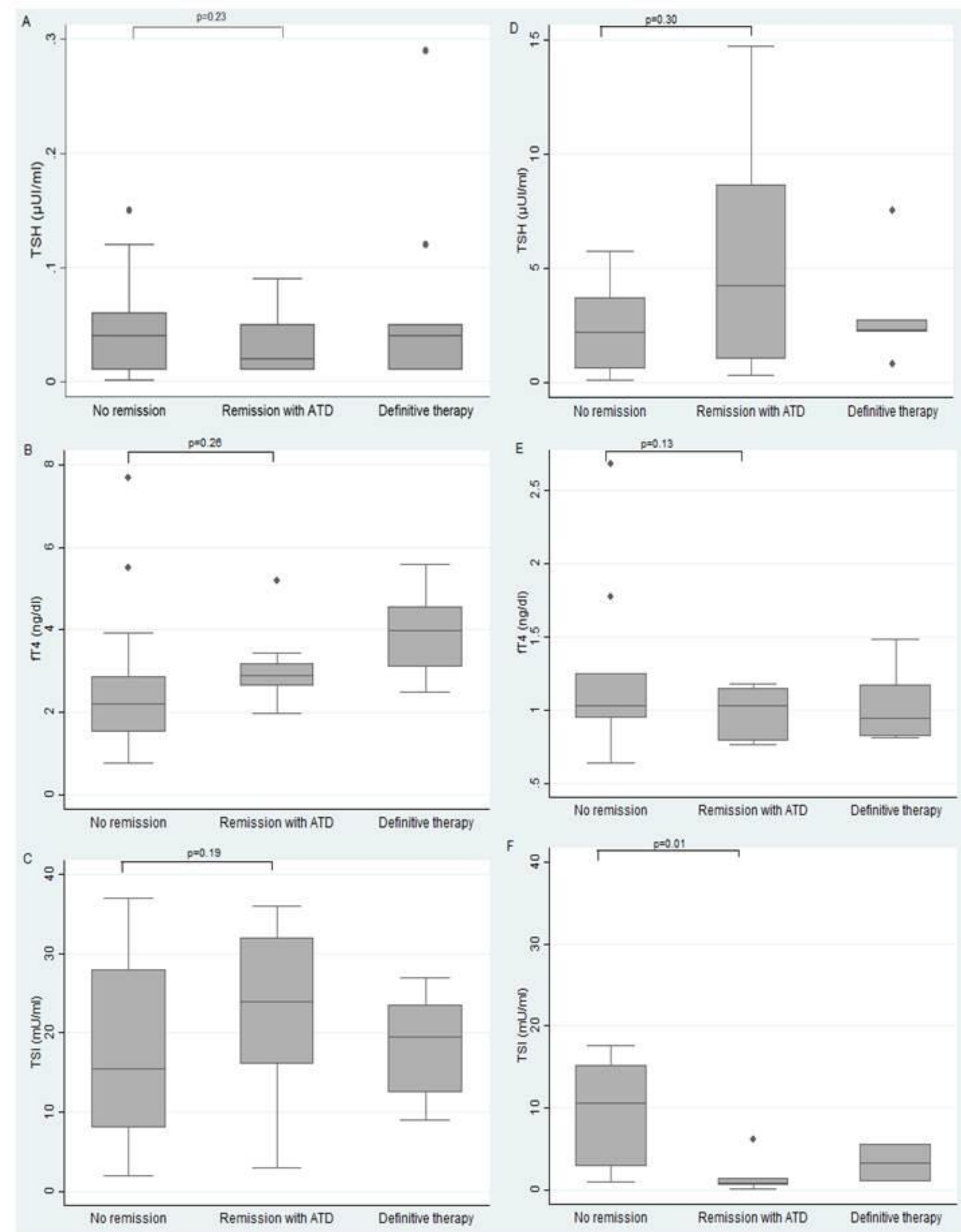
Parameters	Patients with GD (25)	Patients with GD and Down syndrome (11)	P value
Age, years (SD)	12.4 (±3.1)	11.6 (±3.5)	0.25
Female (%)	68	45	0.20
BMI Z-score (SD)	-0.07 (±1.3)	-0.32 (±1.0)	0.29
Puberty (%)	72	63	0.45
Symptoms at onset (%)	88	91	0.64
Goiter (%)	52	27	0.15
Other autoimmune disease (%)	16	36	0.18
Family history of hyperthyroidism (%)	28	18	0.43
TPOAb positivity at onset (%)	88	63	0.11
TGAb positivity at onset (%)	58	40	0.29
TSI normalization (%)	20	27	0.49
Duration of ATD <sup>a</sup> , years (SD)	2.1 (±1.3)	3.6 (±2.2)	0.03
Remission rate <sup>a</sup> (%)	25	45	0.24
Time to remission <sup>a</sup> , years (SD)	2.3 (±1.4)	3.9 (±2.5)	0.03
Relapse rate <sup>a</sup> (%)	15	20	0.65

BMI: Body Mass Index; TSI: Thyroid-stimulating immunoglobulin; TPOAb: antibody against thyroid peroxidase; TGAb: antibody against thyroglobulin; ATD: Anti-thyroid drug.

**Table 2: Multivariable odds ratio [95% CI] for remission according to clinical variables in children with GD.**

Predictor variables	Odds ratio [95% confidence interval]	P value
Female	0.004 [0.00002-0.75]	0.04
Age	0.5 [0.21-1.16]	0.11
Initial ft4	2.8 [0.55-14.4]	0.21
TSI normalization	72.4 [0.28-18412]	0.13
Goiter	2.6 [0.07-90.2]	0.59
Z-BMI	0.6 [0.18-1.82]	0.35

Biochemical variable comparison in 36 children with Graves' disease who achieved remission and those who did not: Serum TSH, free T4 and TSI at onset (figures A, B and C) and at second year of follow-up (figures D, E and F). Box plots show the median, upper and lower hinge values. T bars represent upper and lower adjacent values. Dots represent outside values.



**Conclusion:** Males were more likely to achieve remission. TSI values may normalize in Graves' disease, notably from the second year of treatment. Down syndrome children may benefit from conservative management in GD.