

GP-27-07: Plasmapheresis in thyroid storm caused by exogenous thyroid hormone intake – a case series



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Introduction

Thyroid storm (TS) is a rare and severe form of thyrotoxicosis, characterized by multi-organic dysfunction secondary to a sudden elevation or increased susceptibility to thyroid hormones. Exogenous thyroid hormone intake (ETHI) is a rare and life threatening cause of TS due to a massive and rapid increase in thyroid hormone levels. The cornerstone of treatment is aggressive medical therapy; nevertheless, it might not be sufficient. Plasmapheresis is an extracorporeal technique that can rapidly lower different macromolecules including thyroid hormones. Some small studies have shown that it can be useful as a complementary option to medical therapy as a bridge to surgery in refractory cases of thyroid storm but there are very few series in TS due to ETHI.

Objectives

The aim of this study was to compare the efficacy of plasmapheresis in reducing thyroid hormone levels in TS secondary to exogenous thyroid hormone intake.

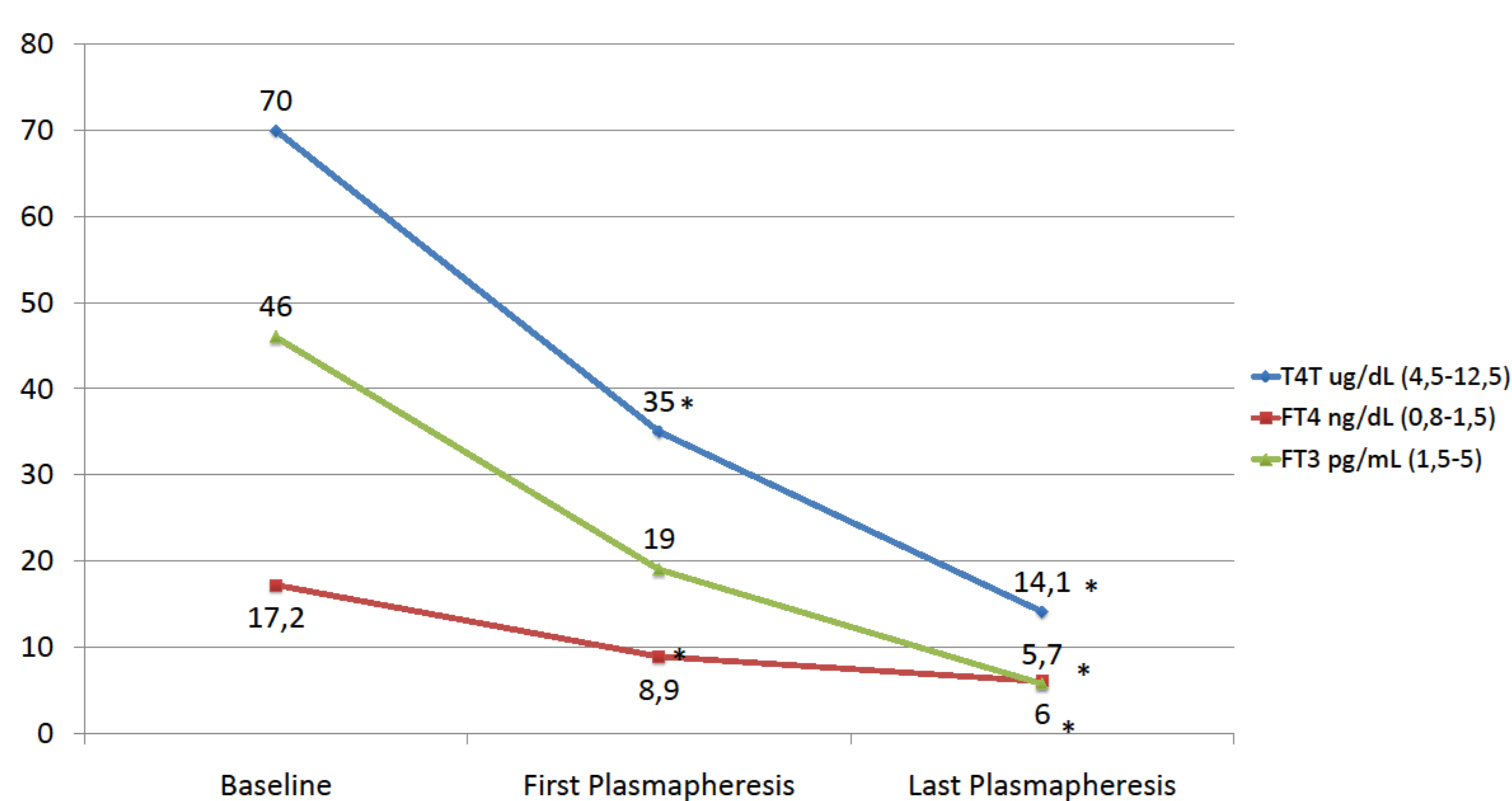
Methods

We retrospectively evaluated all TS cases (Burch and Wartofsky score > 45) caused by ETHI, who presented with progressive worsening of the clinical condition despite medical therapy and were subsequently treated with plasmapheresis between 1991 and 2014 in a tertiary hospital. Patient clinical data, normal thyroglobulin and negative anti-thyroglobulin antibodies ruled out endogenous causes of thyroid storm. Statistical analysis was performed with Wilcoxon test (SPSS v.21).

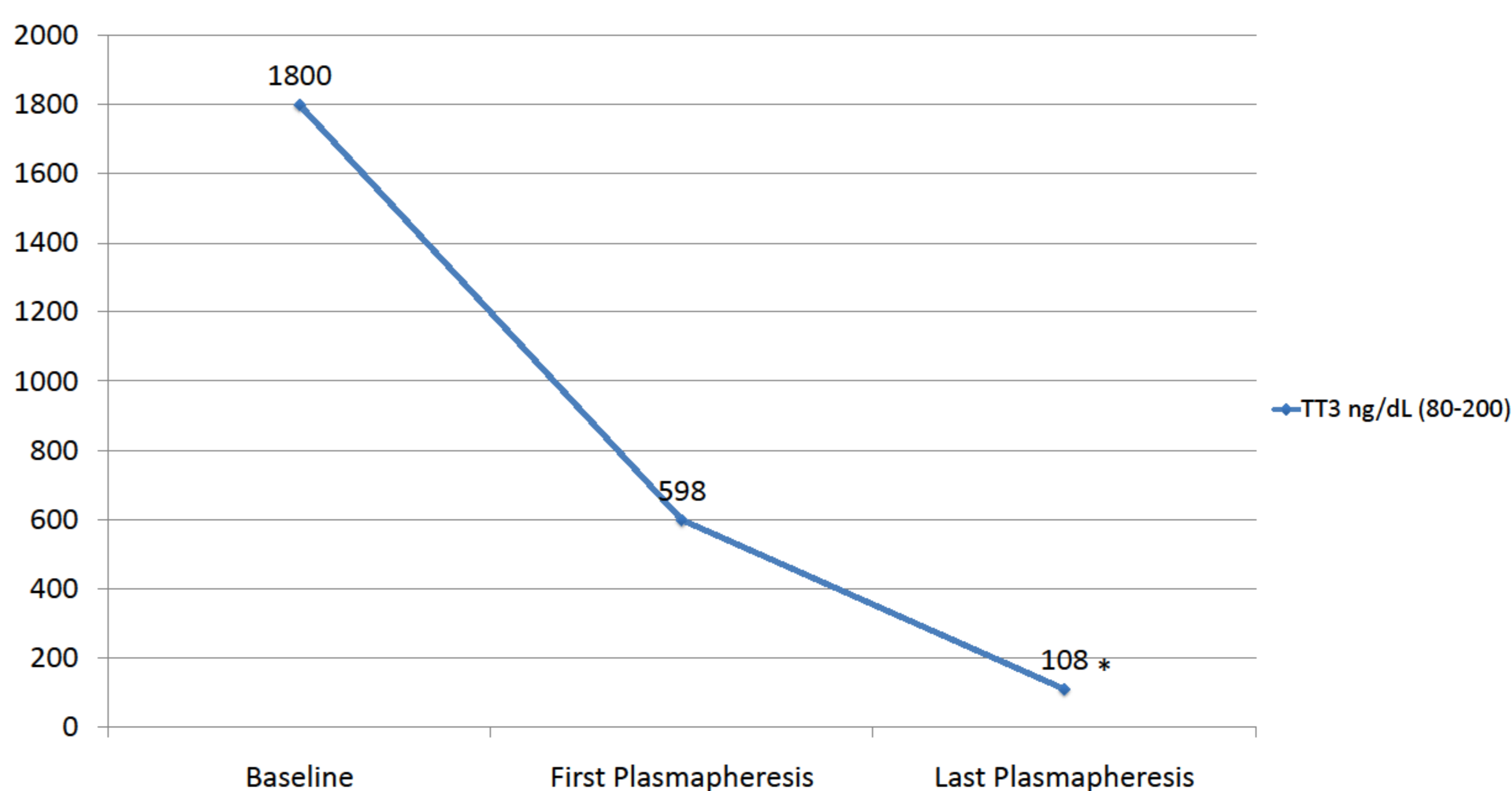
Results

Table 1: Clinical characteristics

Patient	Age (years)	Sex	Cause of ETHI	Initial clinical presentation	Thyroid hormone levels (times upper limit of normal)	Medical therapy	Clinical progression
1	61	Female	Weight loss therapy	Delirium HR: 150 bpm Temperature 38,7	TT4 -3,7x FT4 -9,7x TT3 -3,6x FT3 -4,8x	Propylthiouracil 300 mg 6xd Propranolol 60 mg 4xd Dexamethasone 5 mg 4xd Cholestyramine 4 g 4xd Lugol 8 drops 4xd	Coma Respiratory arrest
2	35	Female	Weight loss therapy	Psychosis HR 140 bpm Temperature 37,3	TT4 -5,6x FT4 -11,5x TT3 -9x FT3 -10x		Acute pulmonary edema
3	37	Female	Weight loss therapy	Extreme lethargy Pedal edema	TT4 -4,2x FT4 -10,9x TT3 -7,7x FT3 -9,2x		Coma Respiratory arrest
4	46	Female	Weight loss therapy	Delirium HR 134 Temperature 37,8	TT4 -5,6x FT4 -30,6x TT3 -9x FT3 -9,8x		Respiratory arrest
5	47	Male	Suicide attemp	Delirium HR 121	TT4 -5,6x FT4 -27,3x TT3 -9x FT3 -9x		Respiratory arrest



Graph 1: Median values of TT4, FT4 and FT3 at baseline and after the first and the last plasmapheresis * p = 0,043



Graph 2: Median values of TT3 at baseline and after the first and the last plasmapheresis *p = 0,043

Conclusions

Our study showed that plasmapheresis induced a significant and rapid decrease in thyroid hormone levels, allowing all patients to recover. No significant side effects were reported. In view of these results plasmapheresis, where available, should be considered as an important second line therapy for refractory TS induced by ETHI and should be started relatively soon in the treatment algorithm.

References

- Burch HB Life threatening thyrotoxicosis Endocrine and Metabolic Medical Emergencies 2014
Akamizu T Diagnostic criteria, clinical features, and incidence of thyroid storm based on nationwide surveys. Thyroid, 22: 661 (2012)