

Macro TSH- a Rare Cause of High Levels of TSH

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Background

Macro TSH is a high molecule weighed complex with low bioactivity that is comprised of TSH and anti-TSH antibodies. Potentiality of macro TSH should be kept in mind in clinically euthyroid and asymptomatic patients with normal free T4 and T3 levels and relatively high TSH levels. Diagnosis of macro TSH is suspected if polyethylene glycol (PEG) precipitable TSH exceeds %75 and confirmed if high molecule weighed TSH is shown with gel filtration chromatography (GFC). Here we represent a case with macro TSH who had initially been treated with levothyroxine for subclinical hypothyroidism.

Case Presentation

7 years, female

- High level of TSH detected in routine control
- No hypothyroid symptoms
- Nothing remarkable in self and family medical history

Physical Examination

BW: 24 kg 50 p, Height: 121 cm 33p

- BP: 100/60 mmHg HR: 82/dk
- Goiter Ø
- Prepubertal

Laboratory

TSH: 19,6 µU/ml, fT4: 1,5 ng/dl

- Anti TPO, anti TG: -
- Thyroid USG: Normal thyroid volume and parenchyma, milimetric colloid cyst

➡ 1 mcg/kg levothyroxine

2nd Month

- TSH: 18 µU/ml, fT4: 1,4 ng/dl

➡ 1,5 mcg/kg levothyroxine

4th Month

- TSH: 9,3 µU/ml, fT4: 1,2 ng/dl

feeling of discomfort after drug intake

Subclinical hypothyroidism?

Macro TSH?

The serum was mixed with %25 PEG in equal quantity to precipitate gamma globulins and quantify free TSH levels. There was %86 precipitation with PEG (meanwhile fT4: 0,95 ng/dl, fT3: 3,55 ng/dl, TSH:39 µU/ml, predicted real TSH level 4,26 µU/ml).

➡ levothyroxine treatment was stopped

At the end of seven months without treatment

- No hypothyroid symptoms
- TSH: 17,3 µU/mL, fT4: 0,73 ng/dL
- PEG precipitable TSH: %99, Ig G bound TSH: %57,7
- More than %90 of TSH was eluted at 150 kDa in GFC which confirmed macro TSH diagnosis (figure-1)

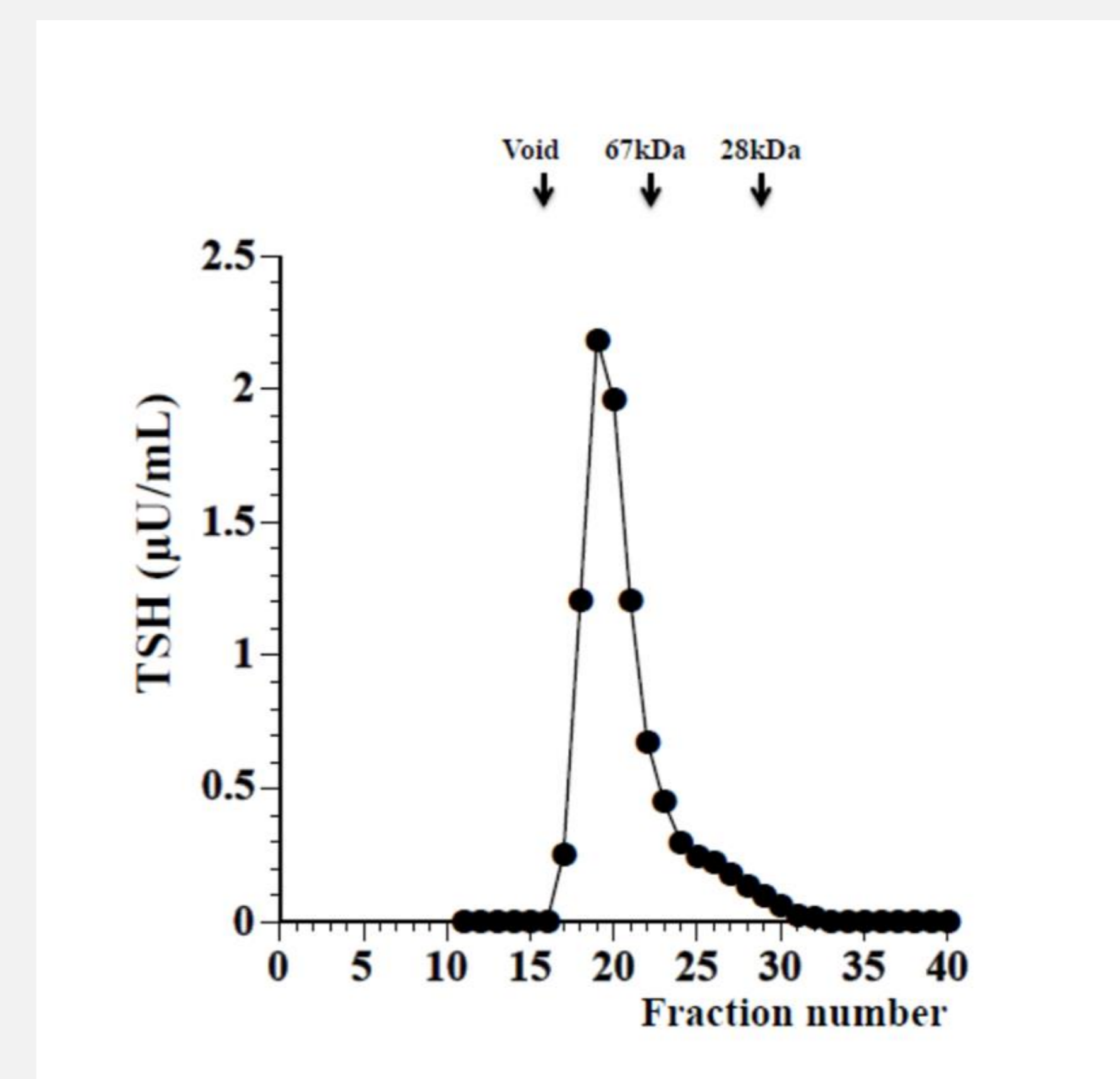


Figure-1 Gel filtration chromatography

Conclusion

In subclinical hypothyroidism cases with TSH levels that are unexpectedly high and unresponsive to levothyroxine treatment, presence of macro TSH should be investigated to prevent unnecessary treatments.