Transient Central Hypothyroidism due to Maternal Graves' disease

Yukie Izumita, Yuki Abe, Shinya Tsukano
Department of Pediatrics, Niigata City General Hospital, Niigata, Japan

Financial Disclosure: Authors have no disclosure

CONTEXT

Maternal Graves' disease (GD) influences the thyroid function of the neonates and may lead not only to thyrotoxicosis but also to hypothyroidism. Because only Thyroid Stimulating Hormone(TSH) is checked for congenital hypothyroidism in most prefectures of Japan, it is difficult to diagnose central hypothyroidism (CH) by newborn screening. We herein describe a case of transient CH due to maternal undiagnosed GD, which could not be diagnosed by the screening.

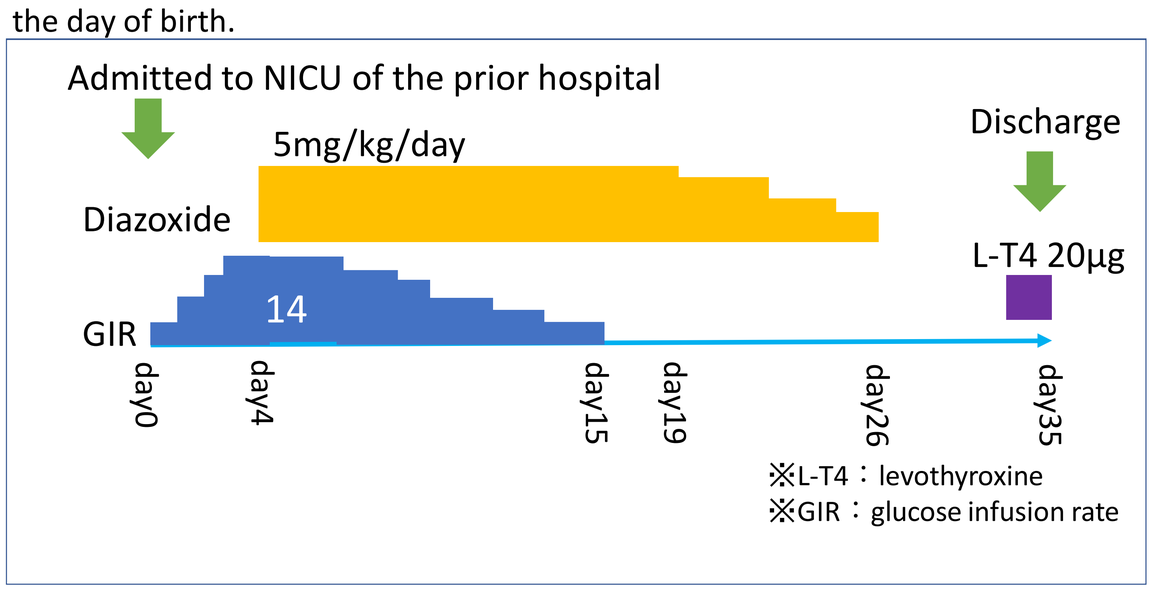
CASE PRESENTATION

Perinatal history

The patient was born at 37w6d of gestation and her birth weight and length were 2320g(-1.2SD) and 43.5cm (-2.1SD) respectively. She was born with NVD and was not in consanguineous family.

Present illness

She developed hypoglycemia and was admitted to NICU of the prior hospital on the day of birth.



She exhibited hypothyroxinemia without elevation of TSH at 34 days old. Her thyroid was proved to be normal both in size and in location by ultrasonography. She underwent 5 μg/kg/day of oral levothyroxine (L-T4).

	Day8	Day34	
fT4	0.9	0.6	(ng/dl)
fT3		2.1	(pg/ml)
TSH	0.06	1.58	(μIU/ml)

With the initial dose, her height and weight had kept sufficient gain and there had been no need to increase L-T4 dose. Thereafter she was referred to our hospital for the treatment of hypothyroidism at the age of 4 months old.

Physical examinations at 4 months old

Body height 57.2cm(-2.4SD), body weight 5935g(+0.1SD), lung no rale, heart no gallop. In terms of physical examination, no abnormality to be noted.
Her psychomotor development was normal.

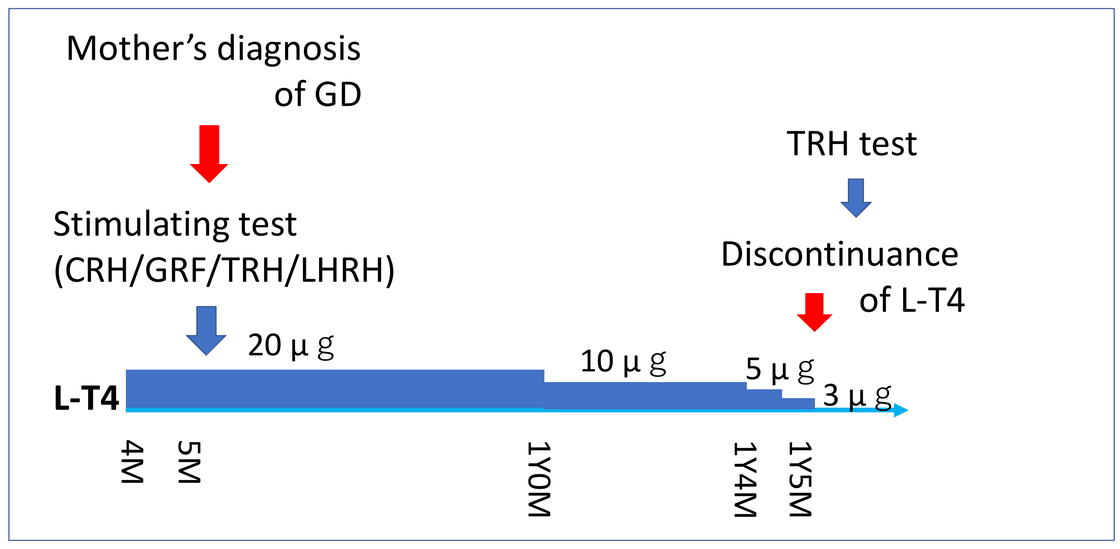
Laboratory data (under the L-T4 supplementation)

Hb	12.3	g/dl	Na	137	mEq/L	IGF-I	73 ng/ml
Ht	37.6	%	K	4.8	mEq/L	Cortisol	11.50 μg/dl
Plt	45万	/μl	Cl	107	mEq/L	ACTH	110 pg/ml
WBC	18600	/μl	Ca	10.4	mg/dl		
ALT	39	IU/L	P	6.3	mg/dl	TSH	0.41 μIU/L
AST	31	IU/L	LH	0.09	mIU/ml	fT3	3.21 pg/ml
ALP	1071	IU/L	FSH	2.49	mIU/ml	fT4	1.28 ng/dl
BUN	8.9	mg/dl	PRL	53.93	ng/ml		
Cr	0.27	mg/dl	HGH	25.0	ng/ml		

We did not need to increase the dose of L-T4. Because Isolated TSH deficiency is rather rare condition, we performed CRH/GRF/TRH/LHRH stimulating test.

CRH/GRF/TRH/LHRH stimulating test	at 5 months old						
	pre	15	30	60	90	120	(min)
TSH	0.031		0.186	0.115	0.067	0.045	(μIU/ml)
LH	<0.09		2.22	2.25	1.54	0.97	(mIU/ml)
FSH	1.57		13.15	19.76	17.77	15.29	(mIU/ml)
PRL	27.24		28.10	24.73	21.55	15.01	(ng/ml)
HGH	3.9		78.8	45.0	23.7	10.5	(ng/ml)
contisl	19.10	21.90	23.10	23.90	21.20	15.10	(μg/dl)
ACTH	51.8	82.8	74.1	62.8	39.9	21.9	(pg/ml)

The stimulating test at 5 months old showed normal pituitary functions except for TSH. We were not able to evaluate TSH because the test was under replacement of L-T4. Her mother was diagnosed as GD when she was 5 months old. The mother's diagnosis and the stimulating test indicated that her CH was transient due to thyrotoxicosis during the pregnancy.



We decreased L-T4 carefully. Her thyroid function remained normal and adverse events such as growth retardation were not observed. She was discontinued the drug at 17 months old successfully. One month later ,we performed TRH stimulating test.

TRH stimulating test	1Y6M					
	pre	30	60	90	120	(min)
TSH	2.5	13.9	8.2	4.3	3.1	(μIU/ml)
PRL	43.7	50.3	25.6	14.2	19.8	(ng/ml)

TRH stimulating test revealed normal reaction of TSH.

DISCUSSION

Our case showed clinical course of transient CH. Her pituitary function test showed the possibility of isolated TSH deficiency, and it is rather rare condition. The diagnosis of her mother's disease indicated the possibility of child's thyrotroph suppression. The mother's objective symptoms were mild, and she thought that her symptoms were effects of pregnancy, which delayed the diagnosis of GD. If her thyroid had been checked when the child's hypothyroidism was noticed, the etiology might have become apparent earlier.

CONCLUSION

Maternal GD may cause transient central hypothyroidism of the child. We recommend that mothers whose neonates have thyroid dysfunction should be routinely evaluated their own thyroid. This may lead to accurate diagnosis of their child's disease.

REFERENCE

1) Nobuo Matsuura, et al. The Mechanisms of Transient Hypothyroxinemia in Infants Born to Mothers with Graves' Disease, • Pediatric Research volume42, pages214–218 (1997)
2)Obrego S, Escobar GMDE, Escobar F, Rey DEL. Is Neuropsychological Development Related to Maternal. 2000;85(11).