

Supplement B: Tyrosine Hydroxylase Deficiency: included patients

Pt NR	Core diagnostic tests	Reference	TML	Prolactin	Urine NT	CSF NT
1	CSF, DNA	[1-4]	x	x	X	x
2	CSF, DNA	[5-7]			X	x
3	CSF, DNA	[5-8]	x		X	x
4	CSF, DNA	[5-8]			X	x
5	CSF, DNA	[5-8]	x		X	x
6	CSF, DNA	[9]		x		
7	CSF, DNA	[9]		x		
8	CSF, DNA	[3, 10, 11]	x	x		x
9	CSF, DNA	[3]			X	
10	CSF, DNA	[12]			X	x
11	CSF, DNA	[13, 14]		x		
12	CSF, DNA	[13, 14]				x
13	CSF, DNA	[13, 14]		x		
14	CSF, DNA	[13-15]		x		x
15	CSF, DNA	[14, 15]		x		x
16	CSF, DNA	[16, 17]				x
17	CSF, DNA	[18]		x	X	x
18	DNA	[19, 20]			X	
19	DNA	[19, 20]			X	
20	CSF, DNA	[21]		x		x
21	CSF, DNA	[22]	x			x
22	CSF, DNA	[14]		x		x
23	CSF, DNA	[14]		x		x
24	CSF, DNA	[23]	x	x	X	
25	DNA	[24]		x		
26	DNA	[24]		x		
27	DNA	[25]			X	

Table Legend:

Core diagnostic tests: diagnostic tests that were reported to confirm TH deficiency. CSF: typical monoamine neurotransmitter profile in cerebrospinal fluid. DNA: molecular diagnosis confirmed.

TML: Translational Metabolic Laboratory, data included from TML database that was not previously reported in the literature.

Prolactin: serum prolactin

Urine NT: measurements of multiple monoamine neurotransmitter metabolites in urine

CSF NT: measurement of monoamine neurotransmitter metabolites in cerebrospinal fluid before and during medical treatment (levodopa with peripheral decarboxylase inhibitor).

Reference list TH deficiency

- [1] C. Brautigam, G.C. Steenbergen-Spanjers, G.F. Hoffmann, C. Dionisi-Vici, L.P. van den Heuvel, J.A. Smeitink, R.A. Wevers, Biochemical and molecular genetic characteristics of the severe form of tyrosine hydroxylase deficiency *Clinical chemistry* 45 (1999) 2073-2078.
- [2] C. Dionisi-Vici, G.F. Hoffmann, V. Leuzzi, H. Hoffken, C. Brautigam, C. Rizzo, G.C. Steenbergen-Spanjers, J.A. Smeitink, R.A. Wevers, Tyrosine hydroxylase deficiency with severe clinical course: clinical and biochemical investigations and optimization of therapy *The Journal of pediatrics* 136 (2000) 560-562.
- [3] G.F. Hoffmann, B. Assmann, C. Brautigam, C. Dionisi-Vici, M. Haussler, J.B. de Klerk, M. Naumann, G.C. Steenbergen-Spanjers, H.M. Strassburg, R.A. Wevers, Tyrosine hydroxylase deficiency causes progressive encephalopathy and dopa-nonresponsive dystonia *Annals of neurology* 54 Suppl 6 (2003) S56-65.
- [4] V. Leuzzi, M. Mastrangelo, M.T. Giannini, R. Carbonetti, G.F. Hoffmann, Neuromotor and cognitive outcomes of early treatment in tyrosine hydroxylase deficiency type B *Neurology* 88 (2017) 501-502.
- [5] C. Brautigam, R.A. Wevers, R.J. Jansen, J.A. Smeitink, J.F. de Rijk-van Andel, F.J. Gabreels, G.F. Hoffmann, Biochemical hallmarks of tyrosine hydroxylase deficiency *Clinical chemistry* 44 (1998) 1897-1904.
- [6] R.A. Wevers, J.F. de Rijk-van Andel, C. Brautigam, B. Geurtz, L.P. van den Heuvel, G.C. Steenbergen-Spanjers, J.A. Smeitink, G.F. Hoffmann, F.J. Gabreels, A review of biochemical and molecular genetic aspects of tyrosine hydroxylase deficiency including a novel mutation (291delC) *Journal of inherited metabolic disease* 22 (1999) 364-373.
- [7] J.F. de Rijk-Van Andel, F.J. Gabreels, B. Geurtz, G.C. Steenbergen-Spanjers, L.P. van Den Heuvel, J.A. Smeitink, R.A. Wevers, L-dopa-responsive infantile hypokinetic rigid parkinsonism due to tyrosine hydroxylase deficiency *Neurology* 55 (2000) 1926-1928.
- [8] L.P. van den Heuvel, B. Luiten, J.A. Smeitink, J.F. de Rijk-van Andel, K. Hyland, G.C. Steenbergen-Spanjers, R.J. Janssen, R.A. Wevers, A common point mutation in the tyrosine hydroxylase gene in autosomal recessive L-DOPA-responsive dystonia in the Dutch population *Hum Genet* 102 (1998) 644-646.
- [9] T. Giovanniello, D. Claps, C. Carducci, C. Carducci, N. Blau, F. Vigevano, I. Antonozzi, V. Leuzzi, A new tyrosine hydroxylase genotype associated with early-onset severe encephalopathy *J Child Neurol* 27 (2012) 523-525.
- [10] R.J. Janssen, R.A. Wevers, M. Haussler, J.A. Luyten, G.C. Steenbergen-Spanjers, G.F. Hoffmann, T. Nagatsu, L.P. Van den Heuvel, A branch site mutation leading to aberrant splicing of the human tyrosine hydroxylase gene in a child with a severe extrapyramidal movement disorder *Ann Hum Genet* 64 (2000) 375-382.
- [11] M. Haussler, G.F. Hoffmann, R.A. Wevers, L-dopa and selegiline for tyrosine hydroxylase deficiency *The Journal of pediatrics* 138 (2001) 451-452.
- [12] B. Ludecke, P.M. Knappskog, P.T. Clayton, R.A. Surtees, J.D. Clelland, S.J. Heales, M.P. Brand, K. Bartholome, T. Flatmark, Recessively inherited L-DOPA-responsive parkinsonism in infancy caused by a point mutation (L205P) in the tyrosine hydroxylase gene *Human molecular genetics* 5 (1996) 1023-1028.
- [13] C.M. Mak, C.W. Lam, T.S. Siu, K.Y. Chan, W.K. Siu, W.L. Yeung, J. Hui, V.C. Wong, L.C. Low, C.H. Ko, C.W. Fung, S.P. Chen, Y.P. Yuen, H.C. Lee, E. Yau, B. Chan, S.F. Tong, S. Tam, Y.W. Chan, Biochemical and molecular characterization of tyrosine hydroxylase deficiency in Hong Kong Chinese *Mol Genet Metab* 99 (2010) 431-433.
- [14] W.L. Yeung, V.C. Wong, K.Y. Chan, J. Hui, C.W. Fung, E. Yau, C.H. Ko, C.W. Lam, C.M. Mak, S. Siu, L. Low, Expanding phenotype and clinical analysis of tyrosine hydroxylase deficiency *J Child Neurol* 26 (2011) 179-187.
- [15] W.L. Yeung, C.W. Lam, J. Hui, S.F. Tong, S.P. Wu, Galactorrhea-a strong clinical clue towards the diagnosis of neurotransmitter disease *Brain Dev* 28 (2006) 389-391.

- [16] M. Ribases, M. Serrano, E. Fernandez-Alvarez, S. Pahisa, A. Ormazabal, A. Garcia-Cazorla, B. Perez-Duenas, J. Campistol, R. Artuch, B. Cormand, A homozygous tyrosine hydroxylase gene promoter mutation in a patient with dopa-responsive encephalopathy: clinical, biochemical and genetic analysis *Mol Genet Metab* 92 (2007) 274-277.
- [17] C. Ortez, S.T. Duarte, A. Ormazabal, M. Serrano, A. Perez, R. Pons, M. Pineda, Z. Yapici, E. Fernandez-Alvarez, R. Domingo-Jimenez, P. De Castro, R. Artuch, A. Garcia-Cazorla, Cerebrospinal fluid synaptic proteins as useful biomarkers in tyrosine hydroxylase deficiency *Mol Genet Metab* 114 (2015) 34-40.
- [18] D.E.L. P, M.C. Nassogne, A.H. van Gennip, A.C. van Cruchten, T. Billatte de Villemeur, M. Cretz, C. Stoll, J.M. Launay, G.C. Steenberger-Spante, L.P. van den Heuvel, R.A. Wevers, J.M. Saudubray, N.G. Abelung, Tyrosine hydroxylase deficiency unresponsive to L-dopa treatment with unusual clinical and biochemical presentation *Journal of inherited metabolic disease* 23 (2000) 819-825.
- [19] P. Rondot, M. Ziegler, Dystonia--L-dopa responsive or juvenile parkinsonism? *Journal of neural transmission. Supplementum* 19 (1983) 273-281.
- [20] R.J. Swaans, P. Rondot, W.O. Renier, L.P. Van Den Heuvel, G.C. Steenbergen-Spanjers, R.A. Wevers, Four novel mutations in the tyrosine hydroxylase gene in patients with infantile parkinsonism *Ann Hum Genet* 64 (2000) 25-31.
- [21] K. Szentivanyi, H. Hansikova, J. Krijt, K. Vinsova, M. Tesarova, E. Rozsypalova, P. Klement, J. Zeman, T. Honzik, Novel mutations in the tyrosine hydroxylase gene in the first Czech patient with tyrosine hydroxylase deficiency *Prague Med Rep* 113 (2012) 136-146.
- [22] M.M. Verbeek, G.C. Steenbergen-Spanjers, M.A. Willemsen, F.A. Hol, J. Smeitink, J. Seeger, P. Grattan-Smith, M.M. Ryan, G.F. Hoffmann, M.A. Donati, N. Blau, R.A. Wevers, Mutations in the cyclic adenosine monophosphate response element of the tyrosine hydroxylase gene *Annals of neurology* 62 (2007) 422-426.
- [23] D.I. Zafeiriou, M.A. Willemsen, M.M. Verbeek, E. Vargiami, A. Ververi, R. Wevers, Tyrosine hydroxylase deficiency with severe clinical course *Mol Genet Metab* 97 (2009) 18-20.
- [24] J.N. Goswami, N. Sankhyan, P.D. Singhi, An Indian Family with Tyrosine Hydroxylase Deficiency *Indian Pediatr* 54 (2017) 499-501.
- [25] B. Feng, G. Sun, Q. Kong, Q. Li, Compound heterozygous mutations in the TH gene in a Chinese family with autosomal-recessive dopa-responsive dystonia: A case report *Medicine (Baltimore)* 97 (2018) e12870.