

Supplement A: AADC deficiency: included patients

Pt NR	Core diagnostic tests reported	References	TML	Prolactin	Blood NT	Urine NT	CSF NT	CSF GT
1	CSF, AADC	[1, 2]				x**		
2	CSF, AADC, DNA	[2-4]	x	x	x	x**	x	
3	CSF, DNA	[5]			x			
4	CSF, AADC	[6]			x			
5	CSF, AADC, DNA	[7, 8]		x	x			
6	CSF, AADC, DNA	[8, 9]		x		x	x	
7	CSF, AADC, DNA	[10, 11]		x		x		x
8	CSF, AADC, DNA	[2, 12-16]	x			x**	x	
9	CSF, AADC, DNA	[2, 3, 12-16]	x			x**	x	
10	CSF, AADC, DNA	[2, 3, 12-16]	x			x**	x	
11	CSF, AADC, DNA	[3, 13, 15, 17]				x**	x	
12	CSF, AADC, DNA	[13, 17, 18]	x	x		x**		
13	CSF, AADC, DNA	[19]		x				
14	CSF, AADC, DNA	[20-23]			x	x	x	
15	CSF, AADC, DNA	[20-23]			x	x	x	
16	CSF, AADC, DNA	[11, 24]					x	x
17	CSF, AADC, DNA	[11, 24]					x	x
18	CSF, AADC, DNA	[14, 25]				x	x	
19	CSF, DNA	[26]		x		x**		
20	CSF, DNA	[27, 28]				x**		
21	CSF, DNA	[29]				x**		
22	CSF, AADC, DNA	[30]		x	x	x		
23	CSF, AADC, DNA	[30]		x	x	x		
24	CSF, AADC	[31]			x			
25	CSF, AADC, DNA	[14]				x		
26	CSF, AADC, DNA	[32]				x		
27	CSF, AADC, DNA	[14]				x		
28	CSF, AADC, DNA	[33]				x		
29	CSF, AADC, DNA	[15, 33]				x		
30	CSF, AADC, DNA	[2, 13, 15]			x	x**		
31	CSF, AADC, DNA	[2, 13, 15]	x			x**		
32	CSF, AADC, DNA	[2, 13, 15]	x			x	x	
33	CSF, AADC, DNA	[2, 13, 15]	x		x	x**	x	
34	CSF, AADC, DNA	[2]		x				
35	CSF, DNA	[2]		x		x		
36	CSF, AADC	[2]		x				
37	CSF, DNA	[2]		x				
38	CSF, AADC	[2]		x				
39	CSF, AADC	[2]		x				
40	CSF, AADC	[2]		x				
41	CSF, DNA	[2]		x				
42	CSF, DNA	[2]		x				
43	CSF, DNA	[2]		x				
44	CSF, DNA	[2]		x				
45	CSF	[2]		x		x		

Pt NR	Core diagnostic tests reported	References	TML	Prolactin	Blood NT	Urine NT	CSF NT	CSF GT
46	CSF	[2]		X		x		
47	DNA	[15]				x		
48	DNA	[15]				x		
49	DNA	[15]	x		x	x**		
50	DNA	[15]				x		
51	DNA	[15]				x		
52	DNA	[15]				x		
53	DNA	[15]				x		
54	DNA	[15]				x		
55	DNA	[15]				x		
56	DNA	[34]				x**		
57	CSF, AADC, DNA	[8]				x		
58	CSF, AADC, DNA	[8]				x		
59	CSF, AADC, DNA	[8]				x		
60	CSF, AADC, DNA	[8]				x		
61	DNA	[8]				x		
62	CSF, DNA	[8]				x		
63	CSF, AADC, DNA	[8]				x		
64	CSF, AADC, DNA	[8]				x		
65	CSF, AADC, DNA	[11, 35]					x	x
66	DNA	[36]		x	x*			
67	DNA	[36]		x	x*			
68	DNA	[36]		x	x*			
69	DNA	[36]		x	x*			
70	CSF, DNA	[37]			x*			
71	CSF, DNA	[38]			x*			
72	CSF, DNA	[38]			x*			x
73	CSF, DNA	[38]			x*			x
74	CSF, DNA	[38]			x*			x
75	CSF, DNA	[38]			x*			x
76	CSF, DNA	[38]			x*			x
77	CSF, DNA	[38]			x*			x
78	CSF, DNA	[38]			x*			x
79	CSF, DNA	[38]			x*			x
80	CSF, DNA	[38]			x*			x
81	CSF, AADC, DNA	[11]						x
82	CSF, AADC, DNA	[11]						x
83	DNA	[39]		x				
84	DNA	[39]		x	x*			
85	DNA	[39]			x*			
86	DNA	[39]			x*			
87	DNA	[39]			x*			
88	DNA	[40]			x*	x		
89	DNA	[40]			x*	x		
90	DNA, AADC, CSF	[41]			x*			
91	DNA, AADC, CSF	[41]			x*			
92	DNA, AADC, CSF	[41]			x*			
93	DNA, AADC, CSF	[41]			x*			
94	DNA, AADC, CSF	[41]			x*			
95	DNA, AADC, CSF	[41]			x*			
97	DNA, AADC, CSF	[41]			x*			

Table Legend:

Core diagnostic tests: diagnostic tests that were reported to confirm AADC deficiency. CSF: typical monoamine neurotransmitter profile in cerebrospinal fluid. AADC: low aromatic l-amino acid decarboxylase enzyme activity. DNA: molecular diagnosis confirmed.

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

Prolactin: serum prolactin reported.

Blood NT: measurements of monoamine neurotransmitter metabolites in blood. *: only 3-OMD measurements available (DBS or plasma)

Urine NT: measurements of monoamine neurotransmitter metabolites in urine. **:measurements of multiple metabolites performed. In the patients without asterix, only dopamine or VLA was reported.

CSF NT: measurement of monoamine neurotransmitter metabolites in cerebrospinal fluid before and during medical treatment

CSF GT: measurement of monoamine neurotransmitter metabolites in cerebrospinal fluid before and after gene therapy.

Reference list AADC-deficiency

- [1] J.E. Abdenur, N. Abeling, N. Specola, L. Jorge, A.B. Schenone, A.C. van Cruchten, N.A. Chamoles, Aromatic l-aminoacid decarboxylase deficiency: unusual neonatal presentation and additional findings in organic acid analysis *Mol Genet Metab* 87 (2006) 48-53.
- [2] L. Brun, L.H. Ngu, W.T. Keng, G.S. Ch'ng, Y.S. Choy, W.L. Hwu, W.T. Lee, M.A. Willemsen, M.M. Verbeek, T. Wassenberg, L. Regal, S. Orcesi, D. Tonduti, P. Accorsi, H. Testard, J.E. Abdenur, S. Tay, G.F. Allen, S. Heales, I. Kern, M. Kato, A. Burlina, C. Manegold, G.F. Hoffmann, N. Blau, Clinical and biochemical features of aromatic L-amino acid decarboxylase deficiency *Neurology* 75 (2010) 64-71.
- [3] N.G. Abeling, C. Brautigam, G.F. Hoffmann, P.G. Barth, R.A. Wevers, J. Jaeken, A. Fiumara, A. Knust, A.H. van Gennip, Pathobiochemical implications of hyperdopaminuria in patients with aromatic L-amino acid decarboxylase deficiency *Journal of inherited metabolic disease* 23 (2000) 325-328.
- [4] N.G. Abeling, A.H. van Gennip, P.G. Barth, C.A. van, M. Westra, F.A. Wijburg, Aromatic L-amino acid decarboxylase deficiency: a new case with a mild clinical presentation and unexpected laboratory findings *Journal of inherited metabolic disease* 21 (1998) 240-242.
- [5] M. Alfadhel, R. Kattan, Aromatic amino Acid decarboxylase deficiency not responding to pyridoxine and bromocriptine therapy: case report and review of response to treatment *Journal of central nervous system disease* 6 (2014) 1-5.
- [6] I.A. Anselm, B.T. Darras, Catecholamine toxicity in aromatic L-amino acid decarboxylase deficiency *Pediatr Neurol* 35 (2006) 142-144.
- [7] J.B. Arnoux, L. Damaj, S. Napuri, V. Serre, L. Hubert, M. Cadoudal, G. Simard, I. Ceballos, L. Christa, P. de Lonlay, Aromatic L-amino acid decarboxylase deficiency is a cause of long-fasting hypoglycemia *The Journal of clinical endocrinology and metabolism* 98 (2013) 4279-4284.
- [8] M.A. Spitz, M.A. Nguyen, S. Roche, B. Heron, M. Milh, P. de Lonlay, L. Lion-Francois, H. Testard, S. Napuri, M. Barth, S. Fournier-Favre, L. Christa, C. Vianey-Saban, C. Corne, A. Roubertie, Chronic Diarrhea in L-Amino Acid Decarboxylase (AADC) Deficiency: A Prominent Clinical Finding Among a Series of Ten French Patients *JIMD reports* 31 (2017) 85-93.
- [9] M. Barth, V. Serre, L. Hubert, Y. Chaabouni, N. Bahi-Buisson, M. Cadoudal, D. Rabier, S.N. Tich, M. Ribeiro, D. Ricquier, A. Munnich, D. Bonneau, P. de Lonlay, L. Christa, Kinetic analyses guide the therapeutic decision in a novel form of moderate aromatic Acid decarboxylase deficiency *JIMD reports* 3 (2012) 25-32.
- [10] S. Ito, T. Nakayama, S. Ide, Y. Ito, H. Oguni, Y.I. Goto, M. Osawa, Aromatic l-amino acid decarboxylase deficiency associated with epilepsy mimicking non-epileptic involuntary movements *Dev Med Child Neur* 50 (2008) 876-878.
- [11] K. Kojima, T. Nakajima, N. Taga, A. Miyauchi, M. Kato, A. Matsumoto, T. Ikeda, K. Nakamura, T. Kubota, H. Mizukami, S. Ono, Y. Onuki, T. Sato, H. Osaka, S.I. Muramatsu, T. Yamagata, Gene therapy improves motor and mental function of aromatic l-amino acid decarboxylase deficiency *Brain : a journal of neurology* 142 (2019) 322-333.
- [12] Y.T. Chang, R. Sharma, J.L. Marsh, J.D. McPherson, J.A. Bedell, A. Knust, C. Brautigam, G.F. Hoffmann, K. Hyland, Levodopa-responsive aromatic L-amino acid decarboxylase deficiency *Annals of neurology* 55 (2004) 435-438.
- [13] M.M. Verbeek, P.B. Geurtz, M.A. Willemsen, R.A. Wevers, Aromatic L-amino acid decarboxylase enzyme activity in deficient patients and heterozygotes *Mol Genet Metab* 90 (2007) 363-369.
- [14] C. Manegold, G.F. Hoffmann, I. Degen, H. Ikonomidou, A. Knust, M.W. Laass, M. Pritsch, E. Wilichowski, F. Horster, Aromatic L-amino acid decarboxylase deficiency: clinical features, drug therapy and follow-up *Journal of inherited metabolic disease* 32 (2009) 371-380.
- [15] T. Wassenberg, M.A. Willemsen, P.B. Geurtz, M. Lammens, K. Verrijp, M. Wilmer, W.T. Lee, R.A. Wevers, M.M. Verbeek, Urinary dopamine in aromatic L-amino acid decarboxylase deficiency: the unsolved paradox *Mol Genet Metab* 101 (2010) 349-356.
- [16] C. Brautigam, R.A. Wevers, K. Hyland, R.K. Sharma, A. Knust, G.F. Hoffman, The influence of L-dopa on methylation capacity in aromatic L-amino acid decarboxylase deficiency: biochemical findings in two patients *Journal of inherited metabolic disease* 23 (2000) 321-324.

- [17] A. Fiumara, C. Brautigam, K. Hyland, R. Sharma, L. Lagae, B. Stoltenborg, G.F. Hoffmann, J. Jaeken, R.A. Wevers, Aromatic L-amino acid decarboxylase deficiency with hyperdopaminuria. Clinical and laboratory findings in response to different therapies *Neuropediatrics* 33 (2002) 203-208.
- [18] M. Mastrangelo, C. Caputi, S. Galosi, M.T. Giannini, V. Leuzzi, Transdermal rotigotine in the treatment of aromatic L-amino acid decarboxylase deficiency *Movement disorders : official journal of the Movement Disorder Society* 28 (2013) 556-557.
- [19] K. Gucuyener, C.S. Kasapkara, L. Tumer, M.M. Verbeek, Aromatic L-Amino acid decarboxylase deficiency: A new case from Turkey with a novel mutation *Annals of Indian Academy of Neurology* 17 (2014) 234-236.
- [20] K. Hyland, P.T. Clayton, Aromatic amino acid decarboxylase deficiency in twins *Journal of inherited metabolic disease* 13 (1990) 301-304.
- [21] K. Hyland, R.A. Surtees, C. Rodeck, P.T. Clayton, Aromatic L-amino acid decarboxylase deficiency: clinical features, diagnosis, and treatment of a new inborn error of neurotransmitter amine synthesis *Neurology* 42 (1992) 1980-1988.
- [22] R. Pons, B. Ford, C.A. Chiriboga, P.T. Clayton, V. Hinton, K. Hyland, R. Sharma, V. De, D.C., Aromatic L-amino acid decarboxylase deficiency: clinical features, treatment, and prognosis *Neurology* 62 (2004) 1058-1065.
- [23] K.J. Swoboda, J.P. Saul, C.E. McKenna, N.B. Speller, K. Hyland, Aromatic L-amino acid decarboxylase deficiency: overview of clinical features and outcomes *Annals of neurology* 54 Suppl 6 (2003) S49-S55.
- [24] S. Ide, M. Sasaki, M. Kato, T. Shiihara, S. Kinoshita, J.Y. Takahashi, Y.I. Goto, Abnormal glucose metabolism in aromatic l-amino acid decarboxylase deficiency *Brain Dev* (2009).
- [25] G.C. Korenke, H.J. Christen, K. Hyland, D.H. Hunneman, F. Hanefeld, Aromatic L-amino acid decarboxylase deficiency: an extrapyramidal movement disorder with oculogyric crises *Eur J Paediatr Neurol* 1 (1997) 67-71.
- [26] H.C. Lee, C.K. Lai, K.C. Yau, T.S. Siu, C.M. Mak, Y.P. Yuen, K.Y. Chan, S. Tam, C.W. Lam, A.Y. Chan, Non-invasive urinary screening for aromatic L-amino acid decarboxylase deficiency in high-prevalence areas: a pilot study *Clinica chimica acta; international journal of clinical chemistry* 413 (2012) 126-130.
- [27] W.T. Lee, J.H. Lin, W.C. Weng, S.S. Peng, Microstructural changes of brain in patients with aromatic L-amino acid decarboxylase deficiency *Hum Brain Mapp* 38 (2017) 1532-1540.
- [28] S. Camargos, A.J. Lees, A. Singleton, F. Cardoso, DYT16: the original cases *Journal of neurology, neurosurgery, and psychiatry* 83 (2012) 1012-1014.
- [29] L.K. Lee, K.M. Cheung, W.W. Cheng, C.H. Ko, H.H. Lee, C.K. Ching, C. Mak, A rare cause of severe diarrhoea diagnosed by urine metabolic screening: aromatic L-amino acid decarboxylase deficiency *Hong Kong medical journal = Xianggang yi xue za zhi / Hong Kong Academy of Medicine* 20 (2014) 161-164.
- [30] C. Dionisi-Vici, G.F. Hoffmann, V. Leuzzi, H. Hoffken, C. Brautigam, C. Rizzo, G.C. Steebergen-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.
- [31] A. Maller, K. Hyland, S. Milstien, I. Biaggioni, I.J. Butler, Aromatic L-amino acid decarboxylase deficiency: clinical features, diagnosis, and treatment of a second family *J Child Neurol* 12 (1997) 349-354.
- [32] L. Brun, L.H. Ngu, W.T. Keng, G.S. Ch'ng, Y.S. Choy, W.L. Hwu, W.T. Lee, M.A. Willemsen, M.M. Verbeek, T. Wassenberg, L. Regal, S. Orcesi, P. Accorsi, D. Tonduti, H. Testard, J.E. Abdenur, S. Tay, G.F. Allen, S. Heales, I. Kern, K. Kato, A. Burlina, C. Manegold, G. Hoffmann, N. Blau, Laboratory diagnosis, treatment, and follow-up of 78 patients with aromatic l-amino acid decarboxylase deficiency *JIMD* 33 (2010) S164.
- [33] S.K. Tay, K.S. Poh, K. Hyland, Y.W. Pang, H.T. Ong, P.S. Low, D.L. Goh, Unusually mild phenotype of AADC deficiency in 2 siblings *Mol Genet Metab* 91 (2007) 374-378.
- [34] T. Wassenberg, L.A. Monnens, B.P. Geurtz, R.A. Wevers, M.M. Verbeek, M.A. Willemsen, The paradox of hyperdopaminuria in aromatic L-amino Acid deficiency explained *JIMD reports* 4 (2012) 39-45.

- [35] K. Kojima, R. Anzai, C. Ohba, T. Goto, A. Miyauchi, B. Thony, H. Saitsu, N. Matsumoto, H. Osaka, T. Yamagata, A female case of aromatic l-amino acid decarboxylase deficiency responsive to MAO-B inhibition *Brain Dev* 38 (2016) 959-963.
- [36] Y.H. Chien, P.W. Chen, N.C. Lee, W.S. Hsieh, P.C. Chiu, W.L. Hwu, F.J. Tsai, S.P. Lin, S.Y. Chu, Y.J. Jong, M.C. Chao, 3-O-methyldopa levels in newborns: Result of newborn screening for aromatic l-amino-acid decarboxylase deficiency *Mol Genet Metab* 118 (2016) 259-263.
- [37] W.L. Hwu, Y.H. Chien, N.C. Lee, M.H. Li, Natural History of Aromatic L-Amino Acid Decarboxylase Deficiency in Taiwan *JIMD reports* 40 (2018) 1-6.
- [38] Y.H. Chien, N.C. Lee, S.H. Tseng, C.H. Tai, S.I. Muramatsu, B.J. Byrne, W.L. Hwu, Efficacy and safety of AAV2 gene therapy in children with aromatic L-amino acid decarboxylase deficiency: an open-label, phase 1/2 trial *Lancet Child Adolesc Health* 1 (2017) 265-273.
- [39] W. Dai, D. Lu, X. Gu, Y. Yu, A.R.D. Mainland Chinese League of, Aromatic L-amino acid decarboxylase deficiency in 17 Mainland China patients: Clinical phenotype, molecular spectrum, and therapy overview *Mol Genet Genomic Med* 8 (2020) e1143.
- [40] B. Monteleone, K. Hyland, Case report: discovery of 2 gene variants for aromatic L-amino acid decarboxylase deficiency in 2 African American siblings *BMC Neurol* 20 (2020) 12.
- [41] H. Brennenstuhl, D. Kohlmüller, G. Gramer, S.F. Garbade, S. Syrbe, P. Feyh, S. Kolker, J.G. Okun, G.F. Hoffmann, T. Opladen, High throughput newborn screening for aromatic L-amino-acid decarboxylase deficiency by analysis of concentrations of 3-O-methyldopa from dried blood spots *Journal of inherited metabolic disease* (2019).