CENTOGENE
THE RARE DISEASE COMPANY

Spinocerebellar Ataxia

Clinical Features

Spinocerebellar ataxias (SCA) are a group of hereditary neurological disorders characterized by slowly progressive ataxia accompanied by cerebellar degeneration. Ataxia is gait imbalance associated with limb incoordination and loss of fine and gross motor control. [1-4]

The most common types of SCA are caused by nucleotide repeat expansions in genes, with the onset and severity of disease depending on the repeat size. Within the same gene, larger expansions can cause a more severe and earlier-onset disease, while shorter expansions cause later-onset disease with a milder phenotype.

More than 40 different genes are known to cause SCA which cause autosomal-dominant, autosomal-recessive, and X-linked spinocerebellar ataxias.[5-25]

Major clinical findings specific for ataxia include the following:[1,2,4,5]

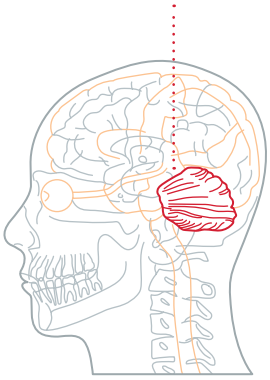
- Gait imbalance and uncoordinated walk (ataxia)
- Dysarthria (abnormal speech)
- Abnormal involuntary eye movements (gaze palsies, slowed saccades, ocular "stare", blepharospasm, ptosis)
- Classic cerebellar signs (like dysmetria, dysdiadochokinesia, intention tremor, etc.)

Less common clinical symptoms:[1,4,5]

- Peripheral neuropathy
- Seizures
- Hearing loss
- Visual loss with retinopathy
- Cognitive decline, dementia, learning difficulties

CEREBELLUM

Part of the brain that fine tunes motor movements



Where/When to use

SCA testing should be considered in cases of:

- Presence of ataxia, cerebellar dysarthria
- Presence of cerebellar atrophy in cerebral magnetic resonance imaging (MRI)
- Individuals with a positive family history of SCA

Testing Strategy

To confirm/establish the diagnosis, the following testing strategy is recommended:

STEP 1: Repeat-expansion analysis of common autosomal dominant genes (Ataxia Repeat Expansion Panel)
STEP 2: NGS panel with CNV analysis of genes associated with spinocerebellar ataxia (Ataxia Panel)
STEP 3: Whole exome sequencing or whole genome sequencing if no mutation is identified by panel testing

Alternatively: Combine step1 and 2 with our comprehensive testing that includes NGS panel with CNV and repeat expansion expansion analysis (Ataxia Comprehensive Panel)

CENTOGENE's Testing Options

CENTOGENE offers the following panels designed for molecular diagnostics of different subtypes of ataxias:

Ataxia Repeat Expansion Panel

ATN1, ATXN1, ATXN10, ATXN2, ATXN3, ATXN7, ATXN8OS, BEAN1, CACNA1A, FXN, NOP56, PPP2R2B, TBP

Includes repeat expansion analysis

Ataxia Panel

ABCB7, ABHD12, ABHD5, ACADVL, ACO2, AFG3L2, AHI1, ALDH5A1, AMACR, ANO10, AP1S2, APTX, ARL13B, ARL6, ARSA, ATCAY, ATM, ATN1, ATP13A2, ATP1A3, ATP2B3, ATP8A2, B9D1, BBS1, BBS12, BSCL2, BTD, C12orf65, C19orf12, CA8, CACNA1A, CACNB4, CAMTA1, CASK, CC2D2A, CCDC88C, CEP290, CEP41, CHMP1A, CLCN2, CLN5, CLN6, CLPP, COASY, COQ2, COQ8A, COQ9, COX20, CP, CPLANE1, CSPP1, CWF19L1, CYP27A1, DARS2, DLAT, DNAJC19, DNAJC5, DNMT1, EIF2B1, EIF2B2, EIF2B3, EIF2B4, EIF2B5, ELOVL4, ELOVL5, EXOSC3, FA2H, FBXL4, FGF14, FLVCR1, FTL, FXN, GALC, GBA, GBA2, GFAP, GJB1, GJC2, GOSR2, GRID2, GRM1, GSS, HEPACAM, HEXB, HIBCH, INPP5E, ITM2B, ITPR1, KCNA1, KCNC3, KCND3, KCNJ10, KIF1A, KIF1C, KIF5A, KIF7, LAMA1, LMNB1, LRPPRC, MARS2, MKS1, MLC1, MRE11, MTFMT, MTPAP, MTTP, NDUFAF6, NDUFS1, NDUFS2, NDUFS4, NDUFS7, NDUFV1, NPC1, NPC2, NPHP1, NUBPL, OFD1, OPA1, OPA3, OPHN1, PANK2, PAX6, PDHX, PDSS1, PDSS2, PDYN, PEX10, PEX2, PEX7, PHYH, PLA2G6, PLP1, PNKD, PNKP, PNPLA6, POLG, POLR3A, POLR3B, PRICKLE1, PRKCG, PRRT2, RARS2, RPGRIP1L, RRM2B, RUBCN, SACS, SCN2A, SETX, SIL1, SLC16A2, SLC17A5, SLC1A3, SLC20A2, SLC25A46, SLC2A1, SLC52A3, SLC9A6, SPG11, SPG7, SPR, SPTBN2, STUB1, SYNE1, TCTN2, TGM6, TMEM216, TMEM237, TMEM240, TMEM67, TPP1, TSEN2, TSEN34, TSEN54, TTBK2, TTC19, TTPA, TUBB4A, TWNK, UBA5, VAMP1, VLDLR, VRK1, WDR81, WFS1, WWOX, ZFYVE26

NGS sequencing with CNV analysis. No repeat expansion analysis is included in the panel.

Ataxia Comprehensive Panel

ABCB7, ABHD12, ABHD5, ACADVL, ACO2, AFG3L2, AHI1, ALDH5A1, AMACR, ANO10, AP1S2, APTX, ARL13B, ARL6, ARSA, ATCAY, ATM, ATN1, ATP13A2, ATP1A3, ATP2B3, ATP8A2, ATXN1, ATXN10, ATXN2, ATXN3, ATXN7, ATXN8OS, B9D1, BBS1, BBS12, BEAN1, BSCL2, BTD, C12ORF65, C19orf12, CA8, CACNA1A, CACNB4, CAMTA1, CASK, CC2D2A, CCDC88C, CEP290, CEP41, CHMP1A, CLCN2, CLN5, CLN6, CLPP, COASY, COQ2, COQ8A, COQ9, COX20, CP, CPLANE1, CSPP1, CWF19L1, CYP27A1, DARS2, DLAT, DNAJC19, DNAJC5, DNMT1, EIF2B1, EIF2B2, EIF2B3, EIF2B4, EIF2B5, ELOVL4, ELOVL5, EXOSC3, FA2H, FBXL4, FGF14, FLVCR1, FTL, FXN, GALC, GBA, GBA2, GFAP, GJB1, GJC2, GOSR2, GRID2, GRM1, GSS, HEPACAM, HEXB, HIBCH, INPP5E, ITM2B, ITPR1, KCNA1, KCNC3, KCND3, KCNJ10, KIF1A, KIF1C, KIF5A, KIF7, LAMA1, LMNB1, LRPPRC, MARS2, MKS1, MLC1, MRE11, MTFMT, MTPAP, MTTP, NDUFAF6, NDUFS1, NDUFS2, NDUFS4, NDUFS7, NDUFV1, NOP56, NPC1, NPC2, NPHP1, NUBPL, OFD1, OPA1, OPA3, OPHN1, PANK2, PAX6, PDHX, PDSS1, PDSS2, PDYN, PEX10, PEX2, PEX7, PHYH, PLA2G6, PLP1, PNKD, PNKP, PNPLA6, POLG, POLR3A, POLR3B, PPP2R2B, PRICKLE1, PRKCG, PRRT2, RARS2, RPGRIP1L, RRM2B, RUBCN, SACS, SCN2A, SETX, SIL1, SLC16A2, SLC17A5, SLC1A3, SLC20A2, SLC25A46, SLC2A1, SLC52A3, SLC9A6, SPG11, SPG7, SPR, SPTBN2, STUB1, SYNE1, TBP, TCTN2, TGM6, TMEM216, TMEM237, TMEM240, TMEM67, TPP1, TSEN2, TSEN34, TSEN54, TTBK2, TTC19, TTPA, TUBB4A, TWNK, UBA5, VAMP1, VLDLR, VRK1, WDR81, WFS1, WWOX, ZFYVE26

NGS sequencing with CNV analysis and repeat expansion analysis for: ATN1, ATXN1, ATXN10, ATXN2, ATXN3, ATXN7, ATXN8OS, BEAN1, CACNA1A, FXN, NOP56, PPP2R2B, TBP

Why CENTOGENE?

- Provide a comprehensive testing solution
- Repeat expansions, sequencing, del/dup
- Use of CentoMD®, the largest mutation database of rare diseases, for interpretation of sequence variants and improved diagnoses
- Highest international standards in both our established Cambridge-based and Rostock-based labs

Billing policies*

- In-network with Medicare and Tricare
- CENTOGENE's Assistance Program helps limit out-of-pocket costs to patients

* Applicable only in the USA

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