Title: PNPO Deficiency *GeneReview* Table 1
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Date: June 2022

Note: The following information is provided by the authors listed above and has not been reviewed by *GeneReviews* staff.

Table 1. Research Data on PLP Measurement, Biochemical Abnormalities in PNPO Deficiency, and Stability of PLP in Plasma Samples and Oral Solutions Used in Treatment

Interested readers are referred to the following citations that provide research data on:

- Pyridoxal 5'-phosphate (PLP) measurement in individuals with PNPO deficiency [Footitt et al 2013, Ware et al 2014, Levtova et al 2015, Mathis et al 2016];
- Stability of PLP in plasma samples [Midttun et al 2005] and in oral solutions [Mohamed-Ahmed et al 2017];
- Secondary changes of neurotransmitters and amino acids in cerebrospinal fluid (CSF) [Mills et al 2005].

Decreased concentration of PLP in CSF and plasma – when measured prior to administration of pyridoxine (PN) or PLP – is nonspecific, but suggests a genetic defect in vitamin B_6 metabolism.

Note: (1) PLP is a photosensitive compound and can rapidly degrade in solution; therefore, samples for PLP measurement should be protected from light. PLP can also degrade when stored at higher temperatures and on repeated freeze thawing [Midttun et al 2005, Mohamed-Ahmed et al 2017]. (2) Concentrations of PLP in CSF in one individual was reported as normal [Levtova et al 2015].

An abnormal B_6 vitamer profile – that is, elevated pyridoxamine (PM), pyridoxamine 5'-phosphate (PMP), and pyridoxine 5´-phosphate (PNP) while on treatment [Footitt et al 2013, Ware et al 2014] and elevated plasma ratio of PM / pyridoxic acid (PA) prior to, or while receiving, vitamin B_6 supplementation [Mathis et al 2016] – is indicative of PNPO deficiency.

Biochemical changes in CSF, plasma, and urine prior to treatment with PN or PLP that are indicative of reduced activity of PLP-dependent enzymes (e.g., PLP is a cofactor for aromatic acid decarboxylase [AADC]) may include:

- Decreased CSF concentrations of homovanillic acid (HVA), 5-hydroxyindoleacetic acid (5-HIAA), and 3-methoxy-4-hydroxyphenylglycol and raised concentrations of 3-methoxytyrosine (also known as 3-O-methyl-DOPA), 5-hydroxytryptophan, L-dopa, and vanillactic acid (VLA);
- Increased CSF concentrations of glycine, taurine, threonine, and histidine, and low CSF concentrations of arginine;

- Elevated plasma concentrations of threonine and glycine, and low plasma concentrations of arginine;
- Increased concentrations of urinary VLA and HVA.

Note: These biochemical abnormalities may only be present transiently in some affected individuals, may be absent in others [Hoffmann et al 2007], and can normalize on treatment with PN or PLP.

References

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