



Hyposerotonergic™ conditions occur when serotonin concentrations are not enough, low, inadequate, depleted, deficient, or suboptimal on a modified normal diet.™

Hypodopaminergic™ conditions occur when dopamine concentrations are not enough, low, inadequate, depleted, deficient, or suboptimal on a modified normal diet.™

Hypoglutathionemia™ conditions occur when glutathione concentrations are not enough, low, inadequate, depleted, deficient, or suboptimal on a modified normal diet.™

- Giving only *serotonin precursors* can deplete dopamine and glutathione.™
- Giving only *dopamine precursors* can deplete dopamine and glutathione.™
- Giving only *glutathione or glutathione precursors* can deplete serotonin and dopamine.™

The centrally acting monoamines (monoamines) are serotonin, dopamine, norepinephrine, and epinephrine.

A **hyposerotonergic condition** or state often accompanies migraine (see the right column).

After diagnosing a migraine, formulate a differential diagnosis to rule out accompanying issues, including a hyposerotonergic condition or state.

Consider using an empirical trial of the hyposerotonergic-hypodopaminergic condition starting point protocol.

Management of the hyposerotonergic condition or state which may accompany migraine requires establishing serotonin concentrations higher than are possible with modification of the normal diet.

"Generally, it was stated that migraine patients have low platelet 5-HT, a sign of hyposerotonergic status of migraine."

Panconesi A. Serotonin and migraine: a reconsideration of the central theory J Headache Pain (2008) 9:267-276

"The low platelet serotonin in migraine almost certainly reflects reduced concentrations of the amine in other parts of the body"

Anthony, M. et al. Journal of Neurology, Neurosurgery, and Psychiatry 1989;52:182-184

"In addition, patients with migraine have low plasma serotonin between migraine attacks"

Lin, Y. et al. Association of Suicide Risk with Headache Frequency Among Migraine Patients with and without Aura Frontiers in Neurology March 2010 Vol 10 Article 228

"In the current study, we identified low levels of serum serotonin in migraine patients"

Ren, C. et al. Biochemical and Biophysical Research Communications Volume 496, Issue 2, 5 February 2018, Pages 267-273

"It has been suggested that migraine might be characterized as a symptom of chronic low serotonin levels or, alternately, a dysregulation of the serotonin system"

Pergolizzi, J. et al. Red wine triggers may lead to better understanding of migraine headache: a narrative review J. Wine Research 2019, VOL. 30, NO. 1, 15-30

"Accordingly, although plasma levels of 5-HT (serotonin) do not necessarily reflect brain 5-HT levels, migraine has been considered a syndrome of chronically low brain 5-HT levels."

Deen, M. et al. High bradlin serotonin levels in migraine between attacks: A 5-HT4 receptor binding PET study NeuroImage Clinical 18 (2018) 97-102