

Medications to Avoid When Alternatives are Available for Mitochondrial Disorders

Drug Category	Drug	Action	Symptoms
Anticonvulsants	Valproate (Depakote)	Sequesters carnitine; decreases fatty acid oxidation, Krebs, ETC activity and oxidative- phosphorylation; complex IV inhibition	Hepatopathy
Psychotropics			
a.Antidepressants	Amitriptyline (Elavil)	Causes autonomic dysfunction	
	Amoxapine		
	Fluoxetine (Prozac)		
	Citalopram (Cipramil)		
b.Antipsychotics	Chlorpromazine (Thorazine)		
	Fluphenazine (Prolixin)		
	Haloperidol (Haldol)		
	Risperidone (Risperdol)		
c.Barbituates	Phenobarbital	Reduces mito protein synthesis; dec # and size of mitochondria	
	Secobarbital (Seconal)	Inhibits NADH dehydrogenase (complex I)	
	Butalbital (Fiorinal)		
	Amobarbital (Amytal)		
	Pentobarbital (Nembutal)		
d.Anxiety meds	Alprazolam (Xanax)		
	Diazepam (Valium, Diastat)		
Cholesterol meds	Statins	Reduce endogenous coenzyme Q10	Myopathy
	Bile acids-cholestyramine	Inhibits ETC	
	Ciprofibrate	Inhibits complex I	
	Fenofibrate		
Analgesic/anti- inflammatory	ASA (Aspirin)	Inhibits ETC and uncouples oxidative-phosphorylation	Reye syndrome (hepatic failure)
	Acetaminophen (Tylenol)	Increases oxidative stress	Hepatopathy
	Indomethacin (Indocin)		
	Naproxen (Aleve)		
	Diclofenac		
Antibiotics	Tetracycline, minocycline	Inhibit beta-oxidation; inhibit mito protein synthesis	
	Chloramphenicol	Inhibits mito protein synthesis	
	Aminoglycosides	Impair mtDNA translation	Hearing loss; cardiac toxicity; renal toxicity
	Linezolid (Zyvox)		Lactic acidosis, optic and peripheral neuropathy
Anti-arrhythmic	Amiodarone	Inhibits beta-oxidation	
Steroids		Reduce transmembrane mito potential	Reports of deterioration in Kearns-Sayre syndrome
Anti-viral	Interferon	Impairs mtDNA transcription	
Anti-retroviral	Zidovudine	Impairs mtDNA replication which causes mtDNA depletion; decreases complex I and IV activity	Carnitine deficiency; lactic acidosis; lipodystrophy; neuropathy; myopathy; hepatic dysfunction
Cancer meds	Doxorubicine (Adriamycin)		
	Cis-platinum	Impairs mtDNA transcription	Hearing loss; cardiac toxicity; renal toxicity
	Tamoxifen		
Diabetes meds	Metformin	Inhibits oxidative-phosphorylation; enhanced glycolysis	Lactic acidosis
Beta-blockers		Causes oxidative stress	Decreased exercisetolerance
Immunizations		No scientific data on oxidative phosphorylation adverse effects	
Anesthetics		Causes oxidative stress	Decreased exercisetolerance
	Propofol	reduce the mitochondrial membrane potential, and impair ATP production rates	Propofol related infusion syndrome: metabolic acidosis, cardiac failure with conduction abnormalities, kidney failure and rhabdomyolysis
IV Induction Agent		Use volatile anesthetics with lower predisposition to malignant hyperthermia (eg sevoflurane)	
Volatile Anesthetics			
Muscle Relaxants		Use agents that minimize predisposition to malignant hyperthermia	