Isovaleric acidemia

Genetics

-IVD (Isovaleryl-CoA dehydrogenase)

-AR

Clinical findings/Dysmorphic features

-Metabolic ketoacidosis, “sweaty feet” odor, dehydration, hyperammonemia, ketonuria, vomiting, hypoglycemia, FTT

-Can be mild, but decompensations can have hyperammonemia, coma, death

-50%: onset few days after birth; poor feeding, vomiting, szs, energy lack; can progress to coma

-50%: onset childhood; may come and go over time; often triggered by infection or by eating increased amount of protein-rich foods

Etiology

-1 in 250,000 in the US

Pathogenesis

-IVD breaks down BCAA leucine; third step in processing leucine (essential amino acid)

-Isovaleric acid and related compounds build up to toxic levels --> damaging the brain and NS

Genetic testing/diagnosis

-Plasma acylcarnitine analysis confirms the increased C5; urine organic acid analysis will show isovalerylglycine; urine acylglycine and acylcarnitine analysis may also be informative

Others

-Low-leucine / low-protein diet and use medical foods

-Glycine and L-carnitine --> removal of isovaleric acid from body

-Neonate with acidosis, ketonuria, hyperammonemia, neutropenia and thrombocytopenia