13.5: Other Routes

Other Routes of Excretion

Several minor routes of excretion occur including mother's milk, sweat, saliva, tears, and semen.

Excretion into Breast Milk

Excretion into milk can be important since toxicants can be passed with milk to the nursing offspring. In addition, toxic substances can pass from cow's milk to people. Toxic substances are excreted into milk by simple diffusion. Both basic substances and lipid soluble compounds can be **excreted into milk (**The National Library of Medicine's **LactMed** is a resource for information on drugs, dietary supplements, and herbs that pass into breast milk.).

Basic substances can be concentrated in milk since milk is more acidic (pH approximately 6.5) than blood plasma. Since milk contains 3–4% lipids, lipid soluble xenobiotics can diffuse along with fats from plasma into the mammary gland and thus can be present in mother's milk. Substances such as lead, mercury, Bisphenol A (BPA), and phthalates that are chemically similar to calcium can also be excreted into milk along with calcium.

Did you know?

Volatile organic compounds (VOCs) found in indoor air can also be found in breast milk.

Examples include MTBE (methyl tert-butyl ether), chloroform, benzene, and toluene. For benzene, toluene, and MTBE, the levels in breast milk followed the indoor air concentrations. However, the infant average daily dose by inhalation exceeded ingestion rates by 25-to-135 fold. Thus, the amount of VOC exposure from indoor air in nonsmoking households is much greater than the VOC exposure from breast milk. Strategies to lessen infant VOC exposure should focus on improving indoor air quality.

Excretion into All Other Body Secretions or Tissues

Excretion of xenobiotics in **all other body secretions or tissues** (including the saliva, sweat, tears, hair, and skin) are of only minor importance. Under conditions of great sweat production, excretion in sweat may reach a significant degree. Some metals, including cadmium, copper, iron, lead, nickel, and zinc, may be eliminated in sweat to some extent. Xenobiotics that passively diffuse into saliva may be swallowed and absorbed by the gastrointestinal system. The excretion of some substances into saliva is responsible for the unpleasant taste that sometimes occurs with time after exposure to a substance.

Knowledge Check

1) The following are minor routes of excretion:

a) Sweat and saliva
b) Urinary excretion, fecal excretion, and exhaled air

Answer

Sweat and saliva - **This is the correct answer.**
Several minor routes of excretion exist, primarily via mother's milk, sweat, saliva, tears, and semen. The main routes of excretion are via urine, feces, and exhaled air.