Therapeutic hypothermia: Consequences

Indications: Protection of brain, spinal cord and heart of post-ischemic and post-traumatic injury.

Consequences of hypothermia:

1. Decreased metabolic rate (decreased cerebral metabolism and O2/glucose consumption
2. Increased membrane stability – (decreased permeability of cell membrane, blood brain barrier and blood vessel wall = decreased edema formation)
3. Prevent of mitigate Ca++ influx into cells, decreased accumulation of excitatory neurotransmitter glutamate in extracellular space
4. Decreased intracellular acidosis
5. Increased lactate, glycerol, fatty acids and ketonic acids = (increased extracellular acidosis)
6. Decreased immune system, with an inhibition of neutrophil and macrophage function, suppression of inflammatory reactions and inhibition of the release of pro-inflammatory cytokines = **increased risk of infection**
7. Prevention or mitigation of reperfusion-related DNA injury, lipid peroxidation and leukotriene production as well as a decrease in the production of nitric oxide
8. Decreased reperfusion injury and free radical production
9. Increased risk of bleeding = **impaired coagulation**
10. Slows cardiac conduction and can provoke arrhythmias, including bradycardia and QT interval prolongation
11. Insulin resistance
12. Cold diuresis = hypovolemia, hypokalemia, hypomagnesemia

Question:

An induced temperature of 33 C is expected to:

a. Increased peripheral edema
b. Induce hyperkalemia
c. Increase urine output
d. Decrease risk of infection

Answer: C – Cold diuresis with hypokalemia, hypovolemia and hypomagnesemia is expected during hypothermia