relative to body mass, decreased subcutaneous fat, and limited thermoregulation (Caglar and Quan, 2016). The temperature of the liquid plays an important role in developing hypoxemia. Cold water decreases metabolic demands and activates the diving reflex, which causes blood to be shunted away from the periphery to vital organs (i.e., the brain and heart). However, prolonged submersion in cold liquids can impair cognition, coordination, and muscle strength that ultimately results in loss of consciousness, decreased cardiac output, and cardiac arrest (Caglar and Quan, 2016).

Therapeutic Management

With rapid treatment, some children can be saved. Resuscitative measures should begin at the scene, and the victim should be transported to the hospital with maximum ventilatory and circulatory support. In the hospital, intensive care is implemented and continued according to the patient's needs.

In general, management of the victim with a submersion injury is based on the degree of cerebral insult. The first priority is to restore oxygen delivery to the cells and prevent further hypoxic damage. A spontaneously breathing child does well in an oxygen-enriched atmosphere; the more severely affected child requires endotracheal intubation and mechanical ventilation. Blood gases and pH are monitored frequently as a guide to oxygen, fluid, and electrolyte therapies. Seizures may occur due to hypoxia and cerebral edema.

All children who have a submersion injury should be observed for at least 6 to 8 hours for observation. Almost half of asymptomatic or minimally symptomatic alert children experience complications (e.g., respiratory compromise, cerebral edema) during the first 4 to 8 hours after the incident (Caglar and Quan, 2016). Aspiration pneumonia is a common complication that occurs approximately 48 to 72 hours after the episode. Bronchospasm, alveolocapillary membrane damage, atelectasis, abscess formation, and acute respiratory distress syndrome are other complications that occur after aspiration of fluid.

Prognosis

The best predictors of a good outcome are length of submersion less than 5 minutes and the presence of sinus rhythm, reactive pupils, and neurologic responsiveness at the scene. The worst prognoses—