# Steroid Usage in the Emergency Room Lenore M. Bacek, DVM, MS, DACVECC

**Abstract:** Steroid usage is a controversial topic, specifically in the emergency setting. There are several specific situations where steroid usage is appropriate while there are many circumstances in which they are not indicated.

# Keywords: steroids, emergency room

## Text:

Steroid usage in the emergency room is a controversial topic and a point of sometimes heated discussion. They can be life-saving in certain situations but can also cause detrimental effects if not used with proper case selection and at proper dosing.

Specific disease situations in which steroid therapy is indicated include hypoadrenocorticism (Addison's disease/Addisonian Crisis), upper airway obstruction, allergic airway disease, immune-mediated disease such as immune-mediated hemolytic anemia, and anaphylaxis.

Corticosteroid	Prednisone	Physiologic	Anti-	Immunosuppressive	frequency
	equivalent	dose	inflammatory	dose	
			dose		
Prednisone	NA	0.25 mg/kg	0.5-1 mg/kg	2 -4 mg/kg	q 12-24h
Dexamethasone	7-10 x	0.025	0.05-0.1	0.2-0.3 mg/kg	q 24h
		mg/kg	mg/kg		
Methylprednisolone	1.25 x	0.2 mg/kg	0.4-0.8 mg/kg	1.6-3.2 mg/kg	q 12-24h

#### Addison's disease/Addisonian crisis/hypoadrenocorticism

Hypoadrenocorticism is a fairly uncommon but often serious disease in dogs. It can be challenging to diagnose and present with similar clinical signs to other more common disease processes such as gastroenteritis or kidney failure. Dogs in an Addisonian crisis typically present with signs of hypovolemic shock including decreased mentation, poor pulse quality, prolonged capillary refill time and cool extremities. There may also be a history of gastrointestinal signs such as vomiting and/or diarrhea. Common blood work abnormalities such as hyponatremia, hyperkalemia and a lack of a stress leukogram are typically present.

Dogs presenting in an Addisonian crisis require emergency management including intravenous fluid therapy until perfusion parameters improve, gastrointestinal support and, ultimately, steroid therapy. Ideally, an adrenocorticotropic-hormone (ACTH) stimulation test should be performed before initiating steroid therapy. However, if this is not possible, dexamethasone can be given without affecting the results.

Once the diagnosis is confirmed, steroids should be initiated at higher than physiologic doses with the goal being to taper to physiologic levels. Mineralocorticoid replacement should be administered in dogs with electrolyte abnormalities (typical Addison's disease).

# **Upper Airway Obstruction**

Upper airway disease, such as tracheal collapse, brachycephalic airway disease and laryngeal paralysis, produces a characteristic stridorous/sterterous noise as well as cyanosis and possible hyperthermia. Animals with upper airway disease are often worsened by stressful activities or exercise.

Emergency management includes sedation, such as butorphanol and/or acepromazine, oxygen, and cooling measures if necessary. A single dose or short-term course of steroid therapy at anti-inflammatory doses can reduced inflammation and clinical signs of upper airway disease.

# **Allergic Airway Disease**

Allergic airway disease, such as feline asthma, is a restrictive disease of the lower airways combined with excess mucus production. These patients commonly present with coughing, wheezing and possible respiratory distress with an expiratory component due to air-trapping. Diagnosis includes ruling out other causes of respiratory distress. Typically, bronchial or bronchointerstitial changes are seen on thoracic radiographs as well as possible lung hyperinflation.

Patients presenting with lower airway disease can also benefit from similar treatment as upper airway obstruction including oxygen and sedation. Anti-inflammatory doses of steroids may help reduce lower airway inflammation. Other therapies such as bronchodilators may be indicated as well.

#### **Immune-Mediated Disease**

Immune-mediated diseases such as immune-mediated hemolytic anemia (IMHA) or immunemediated thrombocytopenia (ITP) are a fairly common reason for emergency presentation. Patients with IMHA may present with minimal clinical signs or in a life-threatening hemolytic crisis. Owners may notice icteric or pale mucous membranes, pigmenturia, lethargy and collapse/weakness. Blood work findings include anemia, spherocytes, auto-agglutination, and hyperbilirubinemia.

Patients with ITP may present with bleeding from any site. Owners may notice dark stool (melena), hematuria, bruising, or collapse/weakness if there is a concurrent blood loss anemia. Blood work findings including severe thrombocytopenia (typically < 20,000/L) and a possible anemia most commonly from blood loss.

Diagnostics should be performed to rule out any secondary causes of the immune-mediated disease including imaging, infectious disease testing, and possibly bone marrow aspirates. Once a diagnosis is confirmed, immunosuppressive steroid therapy should be initiated. At this dose of steroids, side effects are common. Once the disease is in remission (normal hematocrit, normal platelet count), a steroid taper can be initiated.

## **Other Possible Indications**

A single anti-inflammatory dose may be used in situations such as significant cerebral edema secondary to intra-cranial disease. This may be helpful in specific situations where owners decline further diagnostics/therapies.

Steroids may also be beneficial in cases of critical illness-related corticosteroid insufficiency (CIRCI) which may occur in cases of septic shock. These cases are rare and typically have been volume loaded and started on vasopressor therapy before initiating steroid therapy.

## No Indication for Steroid Therapy

Steroids are not indicated or recommended for the treatment of trauma, head trauma, hypovolemic or hemorrhagic shock. In human medicine, a large trial of traumatic brain injury patients showed increased mortality in this population. Also, there has been no survival benefit demonstrated when steroids are used in hypovolemic or hemorrhagic shock.

## Conclusion

Steroids are appropriate in the management of a few disease presenting to the emergency room. It is important to choose the appropriate formulation as well as dosage to prevent unnecessary side effects.

#### **References Available on Request**