Available online at www.sciencedirect.com
ScienceDirect
Theriogenology 70 (2008) 515–534
Theriogenology
www.theriojournal.com

Reproductive emergencies in camelids

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Abstract

Emergencies in theriogenology practice go beyond just saving the life of the patient, but also preserving its reproductive abilities. Camelid emergency medicine is a relatively new field. This paper discusses the most common reproductive emergencies, their diagnosis, treatment, and prognosis in male and female camelids. The conclusions drawn are based primarily on clinical observations by the authors over the last 25 years. Special consideration is given to peculiarities of the species, particularly in the choice of obstetrical manipulations and therapies.

Keywords: Camelid; Pregnancy; Infertility; Neonatology; Emergency

1. Introduction

In theriogenology practice, emergencies are defined not only in terms of concerns for the welfare of the patient, but also for its future reproductive life. The challenge often faced with reproductive emergencies is how to preserve the life of the patient and maximize the chance to maintain reproductive ability. In camelids, this is even more important, as assisted reproductive technologies have either not yet been perfected (semen preservation, in vitro embryo production, nuclear transfer) or are not allowed (embryo transfer) by some breed registries. In the case of pregnant females, which constitute the majority of reproductive emergencies, the life and welfare of the neonate must also be considered. The objective of the present paper is to review the most common reproductive emergencies in male, female, and neonatal camelids. This review draws primarily on the clinical experience of the authors, as there are very limited controlled studies regarding clinical reproduction and emergency care in camelids.

2. Reproductive emergencies in the male

Although many disease processes that present as emergencies may have some severe repercussions on the reproductive process in the male, our review will be limited to diseases and accidents with sudden onset that are directly linked to the urogenital system. Reproductive emergencies in the male camelid are primarily due to sudden onset of visible abnormalities in the external genitalia. These abnormalities can be summarized as acute scrotal or preputial swelling, preputial prolapse or paraphymosis, and post-surgical emergencies [1–3]. In camels, preputial swelling is also a primary clinical sign of acute trypanosomiasis, a disease with high morbidity and mortality in many countries where camel breeding is important [3].

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doi:10.1016/j.theriogenology.2008.04.024

2.1. General approach to examination of the male for reproductive emergency

As with any other emergency, accurate body weight, body condition score, physical examination, degree of dehydration, baseline complete blood count (CBC), blood biochemistry, and urinalysis should be part of the initial evaluation. Immediate placement of an intravenous catheter is indicated in severely compromised or recumbent animals. Ultrasonography of the urogenital organs should also be conducted.

2.2. Acute scrotal swelling

Testicular thermoregulation is very important for normal spermatogenesis in camelids. Therefore, compromised testicular thermoregulation in these animals should considered serious, as the effect on spermatogenesis can be long lasting or permanent. Acute scrotal swelling is generally due to heat stress, trauma, or a local or systemic infectious process. Testicular torsion and scrotal hernia are commonly considered as differential diagnoses in other large animal species, but have never been encountered in camelids in our practice [2].

2.3. Heat stress

Scrotal and preputial edema and development of severe hydrocele are features of heat stress in the male llama and alpaca [2]. This syndrome is relatively common in the USA. Factors predisposing to heat stress include prolonged high ambient temperature and humidity, inadequate shade, long fleece, dark coat color, and obesity. The risk for heat stress is exacerbated by stresses such as transportation, exercise, fighting, and breeding [4,5]. Hyperthermia results from impaired evaporative cooling, particularly under hot and humid conditions [5]. Scrotal edema may be the first clinical sign in the male. The exact pathophysiology of the scrotal and ventral abdominal edema is not well understood. Contributing factors may include inability of the pampiniform plexus and testicular artery to cope with the fluid turnover, or vascular thermal injury resulting in impaired wall permeability and extravasation of intravascular proteins, electrolytes, and fluid into the interstitium.

Many cases may resolve spontaneously, but leave the male infertile for various intervals, usually lasting from 2 months to years [2]. Spermatogenesis (sperm production and semen quality) was severely impaired in llamas housed at an ambient temperature of 29 °C for 4 weeks [6]. These temperatures, relatively common in summer months in many countries outside the native range of South American camelids, can result in infertility due to decreased sperm numbers, decreased motility, and increased abnormalities. The heat index (ambient temperature × humidity) would cause even more severe changes in hot and humid summers [6].

In advanced cases, other clinical signs appear and include hyperthermia, increased salivation, anorexia, depression, ataxia, muscular weakness, dehydration, ketosis/hepatic lipidosis, and dyspnea/hyperpnea [4,5]. These animals generally display an inflammatory or stress leukogram. Anemia may be secondary to hemolysis. Serum biochemical abnormalities may include hypophosphatemia, hypocalcaemia, hypomagnesaemia, hyponatremia, hypochloridemia, hypo- or hyperkalemia, hyperglycemia, and elevated serum AST and CPK concentrations. Serum glucose concentration >300 mg/dL has been associated with a poor prognosis. Severe electrolyte imbalances and damage to the thermoregulatory center in the hypothalamus will be the end point of the disease progress in nontreated animals, leading to multi-organ damage or failure and increased mortality [4,5].

Stabilization of the heat-stressed animal should include urgent cooling of the core body temperature to the normal range (shearing, spraying the ventral abdomen with cold water, fan), and fluid therapy to rehydrate the animal and correct metabolic abnormalities. Intravenous isotonic sodium bicarbonate solution may be required to treat metabolic acidosis. Maintenance fluid rates are 30–40 and 80–120 mL/kg/day in adults and crias, respectively. Pulmonary edema is a serious risk if fluids are administered too fast (>20 mL/kg/h). Palliative therapies against other complications should include nasal oxygen insufflation in hypoxemic patients, nonsteroidal anti-inflammatory drugs (NSAIDs; e.g. flunixin meglumine), antioxidants (vitamin E and selenium), and broad-spectrum antibiotics. Steroids such as dexamethasone may be indicated in advanced cases, but should not be used in females in the second half of pregnancy. Therapeutic diuresis with furosemide is indicated in animals with respiratory distress due to pulmonary edema.

Heat stress is best prevented by timely shearing, adequate hydration (clean, cool water) and providing shade and cooling mechanisms such as sprinklers, a pond, or wading pool. Prevention of obesity and reduction of stresses of long transportation, handling and breeding during the hottest part of the day also reduce the risk for heat stress. The primary indicator of heat stress risk is not only the ambient temperature, but