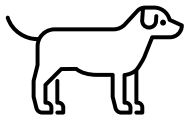
THE ROLE OF HYDROCORTISONE IN CANINE SEPTIC SHOCK

DR.SSA FRANCESCA BUZZURRA – 39°CICLO

SUPERVISOR: PROF. MASSIMO GIUNTI

CO-SUPERVISOR: PROF. FRANCESCO DONDI

Septic Shock



Septic shock = infection + SIRS + refractory hypotension; high mortality rate (> 60%)

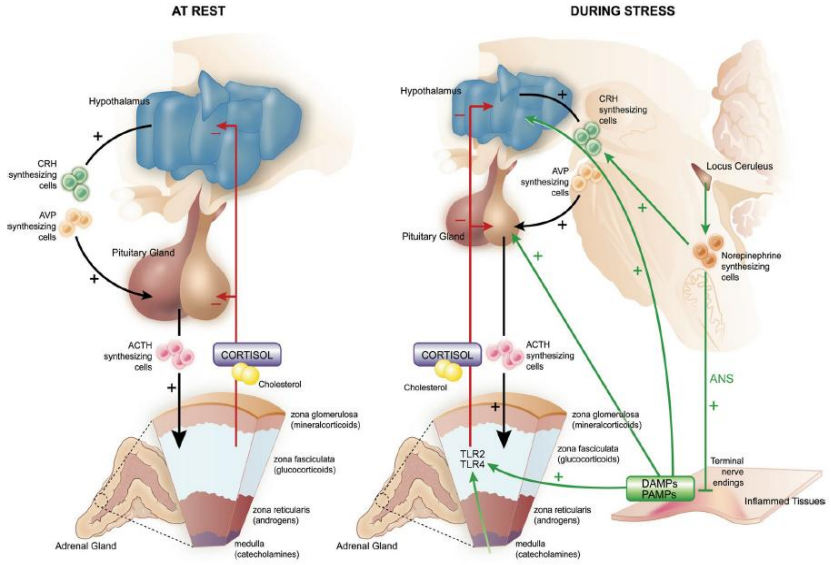
Treatment:

1. Fluid resuscitation
2. Antimicrobial therapy
3. Hemodynamic support (vasopressors and/or inotropes)
4. Adjunctive drugs (corticosteroids)

Critical Illness-Related Corticosteroid Insufficiency

Inadequate cellular corticosteroid activity relative to the degree of physiological stress or exogenous ACTH

1. Decreased ACTH secretion or adrenal responsiveness
2. Altered cortisol-binding protein levels
3. Tissue resistance due to altered glucocorticoid receptors



Clinical signs: hypoglycemia, refractory hypotension to fluids/vasopressors

Hydrocortisone

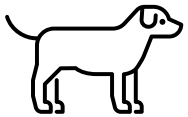
Balanced glucocorticoid and mineralocorticoid activities

1. Restoring vascular responsiveness to catecholamines
2. Modulating the inflammatory response
3. Supporting energy metabolism and maintaining blood glucose during critical illness

Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

Suggesting low-dose hydrocortisone (200 mg/day) only in refractory septic shock

Evidence in veterinary medicine remains limited: high-dose corticosteroids may worsen outcomes, whereas **low-dose ("physiologic") therapy** appears safer.



J Vet Emerg Crit Care (San Antonio). 2021 May;31(3):371-379. doi: 10.1111/vec.13037. Epub 2021 Feb 17.

Retrospective evaluation of the use of hydrocortisone for treatment of suspected critical illness-related corticosteroid insufficiency (CIRCI) in dogs with septic shock (2010-2017): 47 cases

April M Summers [1], Christine Culler [2], Page E Yaxley [3], Julien Guillaumin [4]

Vet J. 2021 Jul:273:105677. doi: 10.1016/j.tvjl.2021.105677. Epub 2021 Apr 16.

Critical illness-related corticosteroid insufficiency in dogs with systemic inflammatory response syndrome: A pilot study in 21 dogs

M Marchetti [1], A Pierini [2], G Favilla [1], V Marchetti [1]

Review. Vet Clin North Am Small Anim Pract. 2011 doi: 10.1016/j.cvsm.2011.03.021. Epub 2011 May 20.

Critical illness-related corticosteroid insufficiency in small animals

Linda G Martin [1]

J Vet Emerg Crit Care (San Antonio). 2025 Jan-Feb;35(1):58-64. doi: 10.1111/vec.13444. Epub 2025 Jan 20.

Retrospective evaluation of dexamethasone for treatment of suspected critical illness-related corticosteroid insufficiency in dogs with septic shock (2017-2022): 60 cases

Destinee Gardiner [1], Bradley Harris [2]

PhD project aim

Prospective randomized study on a population of dogs in septic shock

To evaluate the role of hydrocortisone in canine septic shock:

1. Mortality rate
2. Vasopressor dose and duration of administration
3. Duration of hypotension
4. Length of hospitalization

Population – inclusion criteria

Dogs with septic shock, defined by hypotension (mean arterial pressure < 65 mmHg) associated with confirmed or suspected infection

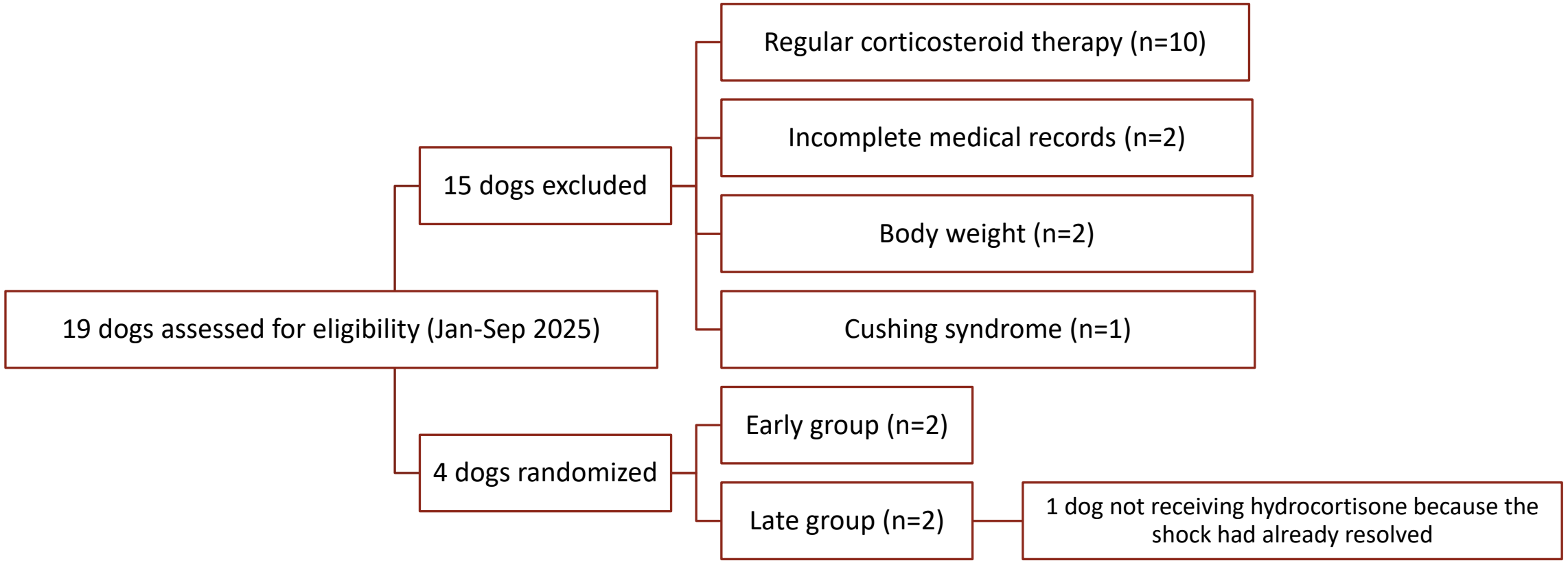
Physical examination data (Canine $APPLE_{fast}$ score)

Clinicopathological data (indexes of organ injury/dysfunction)

Microbiological examination/culture

Exclusion criteria: previous steroid therapy, diagnosis of hypo-/hyperadrenocorticism

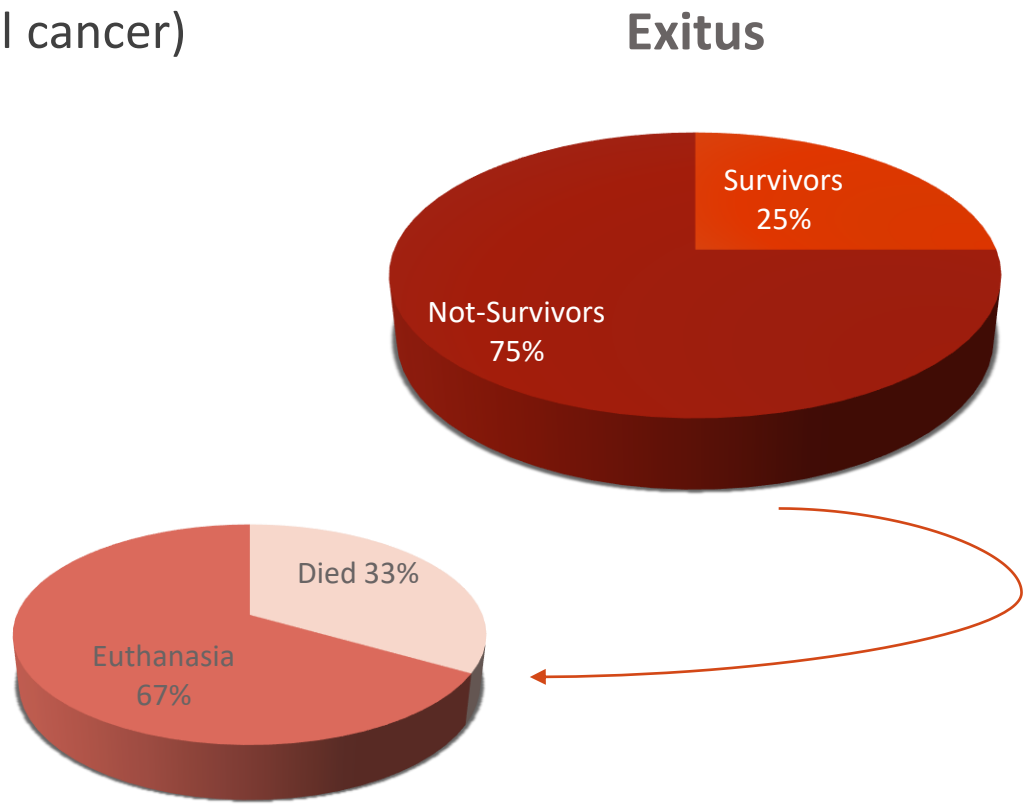
Preliminary data



Preliminary data

4/19 enrolled dogs:

- Source of infection: 100% gastrointestinal (2/4 intestinal cancer)
- 50% positive blood cultures
- Time septic shock: 8.5 hours (4-17 hours)
- No rescue therapy (epinephrine, vasopressin)
- Exitus:
  - 25% (1/4) dog discharged (not received HC)
  - 75% (3/4) dogs not survived
    - 33% (1/3) died
    - 66% (2/3) euthanasia for poor prognosis



THANK YOU

FRANCESCA.BUZZURRA2@UNIBO.IT