DICLOFENAC: A PAST AND FUTURE THREAT FOR VULTURES
Jaume A. Badia Boher – Biologia Ambiental – Juny 2015

Introduction

Dicalfenac is a painkiller veterinary medicine highly toxic to many vulture species. Between 1992 and 2007, this drug caused a catastrophic decline in vulture populations across the Indian subcontinent. Dicalfenac has recently been approved in Spain.

Vultures ingest dicalfenac when they feed on cattle that were previously treated with this drug. Dicalfenac concentration in cattle carcases can be lethal to vultures for up to 7 days after the treatment (Fig. 1).

Objectives

- To analyze the reasons and consequences of the great vulture decline across the Indian subcontinent, caused by dicalfenac.
- To assess the risk that the recent dicalfenac approval for veterinary use can pose to vulture populations in Spain.

The Indian Vulture Crisis

What happened?

- 1994: Dicalfenac approval
- Affected species: Gyps bengalensis, Gyps tenuirostris, Gyps indicus (Fig. 2)
- Conservation status:
  - 1992: Least Concern
  - 2000: Critically Endangered
  - Decline rate (1992 – 2007): 99% (Fig. 3)

Why were the death rates so high?

Due to 3 principal causes:
1. Dicalfenac is often applied to cattle soon before their death
2. Vultures identify new carcasses very rapidly (mean: 30 minutes)
3. Vultures eat high quantities of carrion → high risk of ingesting lethal doses

Demographic model: if 0.13-0.75% of cattle carcases were contaminated by lethal doses of dicalfenac, all three vulture species would die out (Fig. 4).

2006: Dicalfenac ban

- 2006: A new vulture-safe veterinary painkiller is accepted: meloxicam.
- 2009: Substantial decrease in the level of dicalfenac contamination since ban.
- 2011: Vulture populations have stopped decreasing and may even have started growing (Fig. 5).

The cost of vulture decline

The Indian Vulture crisis led to:
- Increase in feral dog population → high increase of human rabies cases
- Increase in uneaten carcases in the field
  - Water, wind and soil pollution
  - Infectious disease outbreaks (e.g. anthrax)
- Higher expenditure in vulture conservation and reintroduction projects

Estimated economic impact (India): 13.100 – 14.600 million euros

What could happen in Spain?

Current context

Spain holds 95% of Europe’s vultures

- 2013: Dicalfenac approval. Directions for use:
  - It can’t be injected to cattle likeable to be consumed by vultures.
  - It must be injected under veterinary supervision.

Exposure ways

- Cattle carcasses disposed of in the open air → regulated.
- Dead cattle carried to carcass dumps → usually in a few hours after death.
- Impossible use as illegal vulture poison.

Diclofenac effect to Spanish vultures

Based on: - Feeding ecology of different taxa
  - Toxicity data (if available)

Griffon vulture (G. fulvus)
  - Confirmed high sensitivity to dicalfenac
  - They eat big quantities of carrion

Expected decrease: HIGH

Egyptian vulture (N. percnopterus)
  - Suspected high sensitivity to dicalfenac
  - They eat small amounts of carrion

Expected decrease: MILD

Black vulture (A. monachus)
  - Unknown sensitivity to dicalfenac
  - They eat mainly bones (low-contaminated)
  - They feed on carcasses long after their death

Expected decrease: MILD

Bearded vulture (G. barbatus)
  - Unknown sensitivity to dicalfenac
  - They eat mainly bones (low-contaminated)

Conclusion

1) Dicalfenac made Indian vultures face extinction in less than a decade.
2) Data show vulture extinction is possible with a very low proportion of poisoned carcases → high risk in Spain!
3) Spanish vulture decline is not expected to be as fast as Indian decline. Gyps fulvus could be the most affected species.
4) Precautionary approach should be applied → dicalfenac should be immediately banned in Spain.
5) European Medicines Agency could establish dicalfenac withdrawal soon.

Bibliography