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Vulture and NSAID

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Abstract

By consuming carcasses, preventing the transmission of illness, and maintaining a healthy environment, vultures play a significant part in the ecology. They are considered obligate scavengers with a very minimal likelihood of spreading disease. The number of vultures has drastically decreased in India since the middle of the 1990s, with three resident Gyps species (White-rumped vulture, Long-billed vulture, and Slender-billed vulture) experiencing a loss of over 97%. Diclofenac was the main culprit to decline in the population of vultures. Diclofenac is a nonsteroidal anti-inflammatory Drug (NSAID) that reduces inflammation and pain in a few different medical diseases. Diclofenac was responsible for kidney failure and visceral gout. The Indian government outlawed the administration of diclofenac in veterinary medicine in May 2006. Unfortunately, the restriction was not extended far enough, and sick animals were treated with human diclofenac. One problem is that alternative medications like meloxicam, which have been examined for vulture safety, are substantially more expensive than the human equivalent of diclofenac.

Keywords: Diclofenac, Meloxicam, NSAIDs, Vulture

Introduction

The four species of vultures that are native to Asia have such severe population declines throughout the 1990s that the designation "Critically Endangered" has been granted to them. The veterinary usage of the diclofenac was the only or primary factor in the severe reduction in Gyps vulture population. Since the veterinary diclofenac prohibition, the population loss of Gyps vultures has stopped or at least slowed, but there has not been a significant recovery in India, in contrast to a

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notable recovery in Nepal. In addition to growing veterinary use of other NSAIDs, such as aceclofenac, nimesulide, ketoprofen, and flunixin, all of which are harmful to vultures, illegal veterinary use of diclofenac has continued in India. Meloxicam, another NSAID, has already been proven to be safe for vultures, and its use in veterinary medicine has increased as a secure substitute.

Effects of Various NSAIDs on Vulture

S. No.	Drug Name	Threat / Safety	Effects
1.	**Diclofenac**	Confirmed Toxic	Kidney failure that is associated with diclofenac is brought on by a reduction in renal prostaglandin production. In 85% of the identified dead vultures, there was evidence of visceral gout, an accumulation of uric acid on the surfaces of internal organs and tissues. Before weakening and dropping out of trees, vultures display the habit known as "neck drooping" for several weeks. Due to the limited vial size of diclofenac - three millimeters - trying to obtain enough dosages to use for cattle currently works out to be much more expensive than medication like tolfenamic acid.
2.	**Aceclofenac**	Confirmed Toxic	Gets converted into diclofenac within hours. Aceclofenac, a prodrug of diclofenac, behaves in domestic water buffalo in a similar manner to that of domestic cattle and putting vultures at risk.
3.	**Ketoprofen**	Confirmed Toxic	High levels of toxicity cause death within 48 hours of ingestion. Bangladesh banned ketoprofen in February 2021.
4.	**Nimesulide**	Confirmed Toxic	Cause visceral gout and renal failure in vulture within 30 hours of ingestion.
5.	**Flunixin**	Toxic	Shown to be toxic to Gyps vulture in Italy and Spain with dead wild birds showing gout and flunixin in tissue. But not fully safety tested in vulture.
6.	**Meloxicam**	Confirmed Safe	It does not act as rapidly after the initial injection and lacks antipyretic qualities. Meloxicam is safe for vulture. It is not toxic like diclofenac. Even at doses greater than the estimated maximum amount of exposure in wild birds, meloxicam was shown not to harm captive Gyps vultures and not increase their blood serum uric acid level.
7.	**Tolfenamic acid**	Confirmed Safe	It is equally priced to other medications in this class and is made by several Indian producers. Tolfenamic acid is the second safe NSAID after meloxicam for vultures. It contains better antipyretic property.

Hollow promises and small victories

The nation has also signed the "Convention on Migratory Species" Multi-species Action Plan to Conserve African-Eurasian Vultures, which acknowledges NSAIDS as a significant threat to

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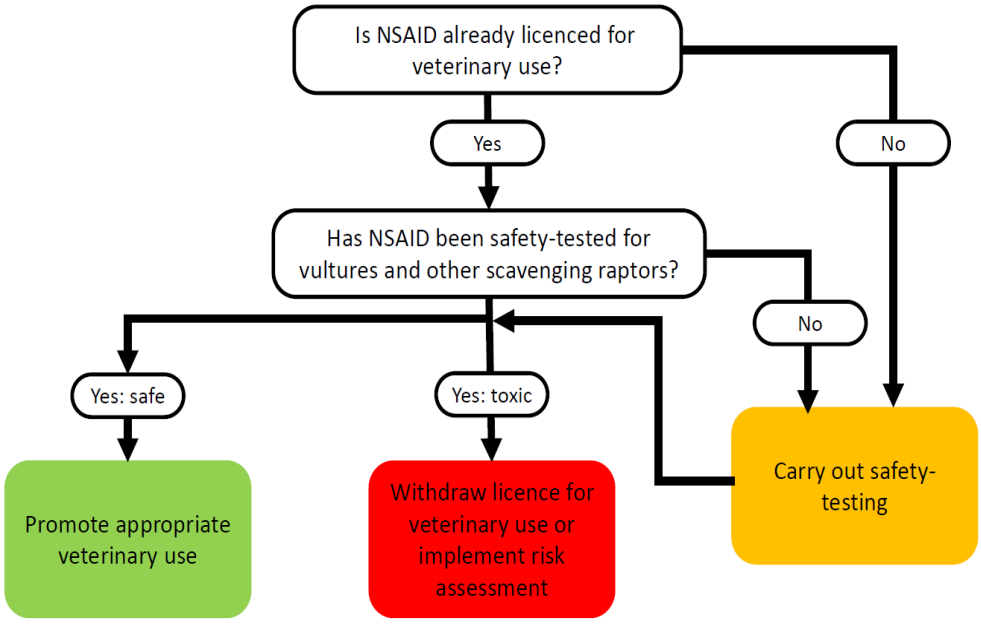
vultures in India. On the ground, however, not much appears to have changed. Nilgiri, Erode, and Coimbatore districts in Tamil Nadu were the first to outlaw the use of ketoprofen in veterinary medicine in 2015. To boost the number of Indian vultures, the Indian government established Project Vulture in 2006. In May 2006, the Indian government made the use of diclofenac in veterinary medicine illegal. Since vultures are sluggish breeders and only lay one egg per year, which has a survival rate of roughly 60%, the impact of the ban will be realized over time.

proposed process for making decision



Current requirement

- All currently approved veterinary NSAIDs must undergo safety testing on vultures.
- Refusal of NSAIDs for use in veterinary medicine after it was discovered that they were poisonous to vultures, invoking section 26A of the Indian Drugs & Cosmetics Act.
- The promotion of meloxicam as a vulture-safe veterinary medicine through educational and awareness campaigns.
- As a preliminary step, they must ensure that aceclofenac, nimesulide, ketoprofen, flunixin, and carprofen are not supplied to the government veterinary services and diclofenac is eliminated from the vultures' food supply through stricter enforcement and monitoring.
- Maintain captive breeding operations for vultures in preparation for their release back into the wild once the environment has been made sufficiently secure and a monitoring system with tracking devices has been set up for the birds.

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- An efficient system is in place to gather dead vultures, analyze them, and report on the factors that led to their demise.
- Veterinary ketoprofen should be prohibited since vultures have been found to be poisoned by it. Already ban in some district of Tamil Nadu.

Conclusion

A little more than 10% of cattle carcasses during 2005–2006 contained diclofenac residue. According to India's second National Vulture Conservation Action Plan (2020–25), published by MoEF&CC, this decreased to around 2% by 2013, except in Rajasthan, where it continued to exceed over 5%. If the incidence of diclofenac in carcasses falls to less than 1%, vulture populations are deemed safe. Lack of awareness and dearth of veterinarians with training, and a profusion of quack physicians who recommend drug overdoses are other issues. Meloxicam and tolfenamic acid are safe for vulture but lack of potent antipyretic property in Meloxicam makes difficult choice as NSAID. Tolfenamic acid appeared to be the more effective analgesic in studies comparing its efficacy to that of meloxicam in easing pain and discomfort related to surgically castrating piglets. Additionally, there is proof that it can increase cattle conception rates.

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