Diclofenac and other Non-steroidal Anti-inflammatory Drugs: Are Vultures in the Iberian Peninsula at Risk?

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Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) for veterinary use that caused the decline of vulture populations in South Asia in the 1990's. Although veterinary regulations exist in Europe, the licensing of this drug may pose serious concerns for vulture health and the important ecosystem services they provide. This could be especially pronounced in the Iberian Peninsula, which holds 95% of Europe's vulture population. Our goal was to assess the risk of NSAIDs exposure to vultures. To uncover exposure pathways from the use of NSAIDs in livestock to the consumption of their carcasses by vultures at the muladares, we conducted surveys targeting veterinarians and muladares managers, and a literature review. Concurrently, we analyzed drug residues from vultures and livestock carcasses collected in the field. We found 99 relevant scientific articles evaluating the effects of NSAIDs on Old World vultures between 2003 and 2019. Surveys showed that 18% of veterinarians regularly prescribed diclofenac to food animals, and 32% of them did not consider risks to other animals when using NSAIDs. From the muladares managers surveyed, 65% were aware that diclofenac was harmful to vultures. Residue analyses of livestock showed a 3.3% of carcasses containing NSAIDs (1.31% flunixin, 0.65% ketoprofen, 0.65% meloxicam, and 0.65% diclofenac), and 4.4% of vultures presented NSAID residues (2.5% flunixin, 1.3% meloxicam, and 0.63% nimesulide). Results of this risk assessment may guide government and veterinary authorities to institute new management and policy changes regarding veterinary NSAID use with the goal of protecting vultures in the Iberian Peninsula.