





Use of Neutersol in the Galapagos

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INTRODUCTION

Isabela is the largest island in the Galapagos archipelago and has the greatest diversity of endemic animal species. In addition to a human population of 1500, the island is colonized by invasive domestic species, including cats and dogs, which are believed to threaten the native wildlife via predation, competition, and infectious diseases.

A novel partnership between the animal welfare group Animal Balance and the Galapagos National Park Service (PNG) was undertaken to control the cat and dog population on the archipelago via sterilization. In the first campaign, volunteers from the United States joined those from the islands to carry out an intensive sterilization campaign during the month of May 2004 on Isla Isabela. Isabela is the largest island in the Galapagos archipelago and has the greatest diversity of endemic animal species as well as a human population of 1,500 residents who primarily inhabit the fishing village of Puerto Villamil. In this village, the dog population freely roams the sandy streets and beaches of the village. Most dogs are friendly and associated with a family residence where they return at night. Some cats also appear to associate with a human residence or business, but others appear to be strays, and some were clearly feral. For the most part, both dogs and cats live outdoors and it is unusual for any animals to be confined in any way. The climate in May is hot (80-90 ºF) and humid. The terrain in the village is primarily desert with sand and lava rock outcroppings. Active volcanoes and rain forest are present in the highlands.

Equipment and supplies for the project were brought in by ship, and a temporary sterilization clinic was established in a building provided by the PNG. The clinic had electricity and running water and was capable of providing both injectable and isoflurane anesthesia and sterile surgery. In addition to surgical sterilization, testicular injection of zinc gluconate (Neutersol) was included as a treatment option for male dogs in the temporary clinic. Supplies were also transported to farms in the highlands where Neutersol was administered on site. The advantages of Neutersol in this environment included less technical administration compared to surgery, no need for anesthesia or surgery packs, and greater acceptance by the residents compared to castration.

METHODS

During the month of May, 80 cats (38 females and 42 males) and 237 dogs (76 females and 161 males) were sterilized. Of the male dogs, 64 were surgically castrated and 97 were treated with Neutersol.

In the U.S., Neutersol is approved only for use in puppies 3-10 months of age with testicles measuring 10-27 mm in width. Injection technique is critical when using Neutersol since leakage or injection of nontarget tissues can result in severe tissue damage. Two of the individuals administering the Neutersol had extensive previous experience, whereas 6 other individuals had not previously used the drug.

In this project, dogs of all ages and sizes were treated. Neutersol doses for dogs with testicles measuring greater than 27 mm were generally truncated at 1.0 ml/testicle (the highest approved dose). Doses for dogs with testicles measuring less than 10 mm were administered 0.1 ml/testicle. A total of 17% of dogs received small doses (0.1-0.2 ml), 31% received medium doses (0.3-0.7 ml), and 52% dogs received large doses (0.8-1.1 ml). Some dogs were sedated with medetomidine. Use of Neutersol was simple, quick, and well-excepted by the dogs, which rarely showed signs of injection pain. Dogs were released to their caretakers at the end of the day. No attempts were made to confine the dogs or to prevent licking or chewing of the injection site.

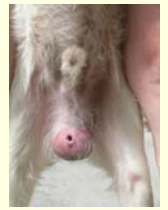

Figure 1 -- Neutersol was administered on-site at the farms in the highlands. In the village, Neutersol was administered in the temporary veterinary clinic. The dose of Neutersol was determined by measurement of testicles with calipers.

RESULTS

Moderate to severe complications associated with sterilization included partial or complete dehiscence of 11 surgical skin incisions (9 spays, 2 castrations) and 4 necrotizing Neutersol injection site reactions. Mild complications such as incisional or injection site swelling were not consistently recorded. Although the complication rate was approximately 4-5% for both surgery and Neutersol, the severity of the Neutersol reactions was more severe and required extensive surgical debridement. All 4 dogs with severe Neutersol reactions were large mature dogs and received a high dose of the drug (0.8-1.0 ml). These reactions occurred following administration by both experienced and novice individuals. All dogs made a full recovery following surgical and antibiotic treatment of incisional dehiscences and injection site reactions.

Figure 2 -- The sequence of events during adverse reactions to Neutersol injection began with local swelling, followed by development of draining tracts, and finally sloughing of necrotic tissue. These images show the spectrum of early to late lesions in 4 dogs with injection site reactions.






CONCLUSIONS

Neutersol has been used successfully in large-scale sterilization clinics in the United States and in third world counties. Although severe reactions have been reported to occur occasionally, they are not expected to occur at the rate observed in the Galapagos project.

Possibilities for the higher than expected rate of complications include improper injection technique, improper post-treatment management, and characteristics unique to the Galapagos dogs or their environment. In this project, dogs were returned to their free-roaming environment within hours of treatment. They were physically active and were not restrained from bothering the injection sight. A few dogs were observed to be breeding in the days following treatment. The hot environment may have contributed to vasodilation and tissue perfusion alterations that contributed to local toxicity of the drug.

The low cost, ease of use, and cultural acceptance of a sterilization technique that does not require removal of the testicles make Neutersol a valuable option for large-scale use. Further investigation is indicated to determine how to avoid the adverse reactions observed in this project.

ANIMAL BALANCE