

THE TOXICITY OF NITROXYNIL IN CATTLE

การศึกษาพิษของยาถ่ายพยาธิไนโตรไซนิล

Vichitr Sukhapesna

วิจิตร สุขเพสน์

Veterinary Research & Education Division, Department of Livestock Development,
Ministry of Agriculture and Cooperatives, Bangkok Metropolis 10400.

กองวิชาการ กรมปศุสัตว์ กระทรวงเกษตรและสหกรณ์ กท. 10400

บทคัดย่อ

ศึกษาพิษของยาถ่ายพยาธิไนโตรไซนิลที่ฉีดเข้าใต้หนังในลูกโคและโครุ่นพันธุ์ไทย และพันธุ์ลูกผสม ขนาดของยาที่ลูกโคและโครุ่นสามารถทนทานได้คือ 50 มิลลิกรัมต่อน้ำหนักตัว 1 กิโลกรัม ขนาดของยาที่ทำให้ลูกโคและโครุ่นตายคือตั้งแต่ 55 มิลลิกรัมต่อกิโลกรัมขึ้นไป ขนาดของยาตั้งกล่าวนี้ทำให้สัตว์ตายภายใน 24 ถึง 28 ชั่วโมง และสัตว์จะแสดงอาการป่วยให้เห็นด้วยยาถ่ายพยาธิไนโตรไซนิลขนาด 10 มิลลิกรัมต่อน้ำหนักตัว 1 กิโลกรัม ไม่มีผลต่อการผสมติด นอกจากนี้ยังสามารถให้ยาถ่ายพยาธิไนโตรไซนิลติดต่อกันโดยเว้นระยะห่างกัน 1 เดือนในแม่โคที่ตั้งท้องได้จนถึง 8 เดือน

Abstract

The toxicity of nitroxynil in the native and crossbred calves and yearling cattle was determined by administered subcutaneously in the dosage of 40, 45, 50, 55 and 60 mg/kg body weight. The maximum tolerated dosage was 50 mg/kg body weight in calves and yearling cattle. The lethal dosages were 55 and 60 mg/kg body weight in calves and yearling

cattle respectively. The toxic doses caused the animals death in 24 to 28 hours with clinical signs.

Furthermore, the dosage of 10 mg/kg body weight, nitroxylin had no effect on fertility, embryos or foetuses. The drug could be administered repeatedly at 1 month interval to the pregnant cows up to 8 months of gestation.

Introduction

Nitroxylin (4 cyano-2-iodo-6-nitrophenol) is highly effective against *Fasciola* in livestock (Roy and Reddy, 1969; Sukhapesna, 1978 and 1980). The drug has also been reported to be highly effective against some important gastrointestinal nematodes, such as *Haemonchus*, *Mecistocirrus* and *Oesophagostomum* (Sukhapesna, 1980 and 1981).

The maximum tolerated dose of 40 mg of nitroxylin per kg body weight in sheep and calves produced the symptoms of increasing in heart, respiratory and metabolic rates (Davis *et al.*, 1966). Therefore, the purpose of this experiment was to study the maximum tolerated dose of nitroxylin both in calves and yearling cattle in certain conditions in the northeastern part of Thailand. Effect of nitroxylin on the breeding performance and on the foetuses in pregnant cows at various gestation period was also studied.

Materials and Methods

Study the toxicity of nitroxylin

Nitroxylin of 34% concentration was used in calves (3 to 6 months old) and yearling cattle (1 to 2 years old) in this study. They are Thai native or crossbred cattle, raised together with their dams and grazed along the roadside and paddy fields during the day and housed at night.

Twenty-eight calves and 28 yearling cattle were allotted into 6 groups, depending on age and body weight. Forty-eight animals were used in groups 1,2,3 and 6 of 12 each

(6 calves and 6 yearling cattle). The other 8 animals were used in groups 4 and 5 of 4 each (2 calves and 2 yearling cattle). Subcutaneous administrations were given to each group as follows:

Group 1: Gave 40 mg/kg body weight.

Group 2: Gave 45 mg/kg body weight.

Group 3: Gave 50 mg/kg body weight.

Group 4: Gave 55 mg/kg body weight.

Group 5: Gave 60 mg/kg body weight.

Group 6: Untreated

Each animal was kept in the stall for 5 days after administered the drug for observing the side effects or toxicosis which might be produced in the treated animals.

Study the effect of nitroxylin on fertility and on foetuses

Twenty Thai native cows were used to study the effect of nitroxylin on breeding performance or on fertility. The other 50 pregnant cows (25 Thai native and 25 crossbred cows) at various gestation period were used to study the effect of nitroxylin on embryos or foetuses. The animals were taken care in the same manner as the previous experiment. Each animal was administered with nitroxylin at a dosage of 10 mg/kg body weight. The drug was also administered repeatedly at 1 month interval until the cows gave delivery. Effect of nitroxylin on breeding performance and on foetuses was observed from all the treated cows.

Results

Study the toxicity of nitroxylin

The toxicity of nitroxylin in calves and yearling cattle is presented in Table 1. The data indicates that the maximum tolerated in calves and yearling cattle was 50 mg/kg b. wt. None of the calves and yearling cattle died while treated with nitroxylin at

the doses of 40, 45 and 50 mg/kg b. wt. Although some animals produced clinical signs such as dullness, anorexia, hyperpnea and hyperthermia after 1 to 2 days of administration. All calves and yearling cattle died after receiving nitroxylinil at the doses of 55 and 60 mg/kg b. wt. Deaths from toxicity of the drug occurred between 24 to 28 hours after the treatment. In case of animals died from the acute toxicity of nitroxylinil, the animals exhibited the following clinical signs such as anorexia, hyperpnea, dullness, weakness, emaciation, incoordination, lied down, dyspnea, trying to breathe by mouth, salivation, and the yellowish fluid flowing from the nostrils and ears in some cases and death.

Animals in untreated group were all alive.

Table 1. Acute toxicity of nitroxylinil administered subcutaneously to calves and yearling cattle.

Dosage (mg/kg b. wt.)	Number of deaths per number treated	
	Calves	Yearling cattle
Group 1 40	0/6	0/6
Group 2 45	0/6	0/6
Group 3 50	0/6	0/6
Group 4 55	2/2	2/2
Group 5 60	2/2	2/2
Group 6 Untreated	0/6	0/6

At necropsy findings, the yellowish crystalline deposits were found subcutaneously at the site of injection. Carcasses were very anemic. Mucous membranes, subcutaneous tissues, muscles, tendons and most internal organs were pale and yellow in appearance. Hydrothorax and hydroperitonia in some cases were found. Inflammation lesions were present in the lungs. Excessive air bubbles in the trachea and bronchi were also found in some cases.

Study the effect of nitroxylin on fertility and on foetuses

The effect of nitroxylin on fertility and foetuses is present in Table 2. The results indicated that nitroxylin had no effect on fertility. All treated cows were pregnant

Table 2. Effect of nitroxylin at a dose of 10 mg/kg body weight on fertility or foetuses.

Number of treated cows	Number of injection (s)*	Initial injection	Number of pregnancy	Number of calves after birth	
				Survive	Death
10	1	1 month before mating	10/10	—	—
10	2	2 months before mating	10/10	—	—
10	6-7	2-3 months of pregnancy	10	0	0
10	4-5	4-5 months of pregnancy	10	0	0
10	2-3	6-7 months of pregnancy	10	0	0
10	1-2	8-9 months of pregnancy	7	3	3
10	Untreated		10/10	9	1

* At 1 month interval.

after mated and gave birth of healthy calves but 3 out of 10 calves born from the treated pregnant cows at 8 or 9 months of gestation period were dead a few days after birth. These calves looked healthy at birth but they could not get up to suck milk from their dams since they were born. That was the cause of death of the calves. One out of 10 calves born from the untreated pregnant cows was also dead a few days after birth with similar symptoms.

Discussion

The results show that nitroxylinil at the dose of 10 mg/kg b. wt. had no adverse effect on fertility because all treated cows were pregnant. The drug could be administered repeatedly to the pregnant cows up to 8 months of gestation. Thus, it supported the findings of Davis *et al.* (1966), Lucas (1967), and Roy and Reddy (1969) that nitroxylinil had no effect on reproductive performance in sheep, cattle and buffaloes.

The effect of nitroxylinil on foetuses in cows at 8 months of pregnancy or more was questioned because the calves were born in healthy condition but they could not suck colostrum and milk from their dams. Moreover similar situation was also found in a calf born from a untreated cow. Mineral deficiency may involved the weakness of the calves more than by the effect of the drug because they were fed with grass and rice straw only.

References

Davis, M., J.M.S. Lucas., J. Rosenbaum, and D.E. Wright. 1966.

4-cyano-2-iodo-6-nitrophenol : a new fasciolicide. *Nature* 211 : 882-883.

Lucas, J.M.S. 1967. 4-cyano-2-iodo-6-nitrophenol, *M & B* 10, 755.

I. Activity against experimental fascioliasis in rabbits, sheep and calves.

British Vet. J. 123 : 198-211.

Roy, R.M., and N.R. Reddy. 1969. Studies on the activity of nitroxylin against *Fasciola gigantica* in naturally infected buffaloes, cattle and sheep. Vet. Rec. 85 : 85-87.

Sukhapesna, V. 1978. Anthelmintic activity of rafoxanide and nitroxylin against *Fasciola* spp. in buffaloes. Thai J. Agric. Sci. 11 (1) : 31-36.

Sukhapesna, V. 1980. Anthelmintic activity of nitroxylin against *Fasciola gigantica* in cattle. J. Parasitol. Trop. Med. Assoc. 3 (2) : 55-60.

Sukhapesna, V. 1981. Anthelmintic activity of nitroxylin against *Fasciola gigantica* in swamp buffaloes. Thai Vet. Med. Assoc. 32 (2) : 155-160.



แพคเกจรวมโรค ครอบคลุม

ภัย

ในยุคที่เงินตราราคาต่ำ

จึงต้องมีไฟส์ดำเข้าหาหน้า

ความตะกละโกงกินมวชวชน

ต่างเปิดฉากโกงกินกันอลวน

ภัยมนุษย์เออลันบนบาทโลก

ภัยความโศกเนืองนองทั่วทองถนน

ภัยกิเลสเออคร่าเข้าตาคน

ภัยความจนใครจะเห็นว่า เป็นภัย ?

แจ้งวิเวก ชลาลัย

ไทยรัฐ 1 ธันวาคม 2527

ของใหม่ ออกใหม่เดือนสิงหาคม

พิเศษลดราคา 100% ชดเชยค่าจัดส่ง

เขื่อนห้วยคั่นกม. 10