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CASE REPORT

Treatment of Bovine Skin Papillomatosis with Gasoline

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ABSTRACT

In this study, the curative efficacy of gasoline as a petroleum product in skin papillomatosis of cattle has been investigated. A total of 20 cattle with papillomatosis were divided into two groups (control and experimental). The gasoline was sprayed on the animals in the experimental group twice a day for 15 days. During the application period, some parameters of the animals in the control and experimental groups were measured at intervals of three days. In addition, after the application, the lesions were monitored at 7-days intervals during 50 days. Fifty days later, the animals in the control group did not recover while the animals in the experimental group recovered at the rate of 90%. As a result of the research, it has been concluded that gasoline is effective on skin papillomatosis in cattle.

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INTRODUCTION

Skin papillomatosis is a benign tumoral disease characterized by hyperplasia of skin tissue in all mammals and birds, especially cattle. The cause of the disease is Bovine papilloma virus (BPV), which is among the DNA viruses. Six subtypes (BPV-Type 1, 2, 3, 4, 5, 6) are isolated (Alçığır and Timurkan, 2018). Twelve serotypes of BPV were initially determined by studies (Shruthi *et al*., 2018), this number has reached fourteen (Kale *et al*., 2018) as a result of further research, or even twenty-three according to the latest information (Bassi *et al*., 2019). The disease is most common in cattle. The first remarkable symptom of the disease is wart-like reproduction that occurs on the skin (Shruthi *et al*., 2018). Depending on the cause of the disease, these reproductions can turn into malignant tumors (Kale *et al*., 2019). Under regular conditions, this disease is caused by Bovin Papilomavirus 1 (BPV-1) and Bovin Papilomavirus 2 (BPV-2), which are subtypes of papillomavirus. Bovine Papillomatovirus can cause fibroblastic tumors by infecting horses as well as cattle However, it is accepted that the main virus-carriers are cattle (Shruthi *et al*., 2018).

As is known, gasoline is a petroleum product and it is a mixture containing various hydrocarbons in its structure. Gasoline is called simple, unleaded and premium gasoline according to their chemical structure. Simple gasoline consists of pentane, hexane, heptane and octane as a chemical structure (Doğan, 2016). Many studies have been carried out about octane, which is one of the chemical contents of gasoline. In the research, it is used as a herbicide in the fight against weeds in order to increase the yield in agricultural production, especially potato, wheat, rice, corn and cotton (Huang *et al*., 2019).

There are reports that skin papillomatosis, which causes economic damage in cattle, is treated empirically with gasoline in Ardahan and Iğdır region. It is known that aldehyde derivatives, into which hydrocarbons contained in gasoline are transformed as a result of metabolism, have a toxic effect against cells (Doğan, 2016). This strengthens the idea that gasoline may have an effect on papillomas. In the literature reviews, it is not seen that in Turkey and other countries the gasoline is used in papillomatosis. In this study, the aim is to investigate the effectiveness of gasoline in the treatment of skin papillomatosis in cattle.

MATERIALS AND METHODS

This study has been approved by the Ethics Committee of Kafkas University (decision dated 19.11.2019 and numbered KAU-HAYDEK/2019-145) and Ministry of Agriculture and Forestry (letter dated 04.12.2019 and numbered 3702958).

The study included a total of 20 cattle in different sexes and races. The 6-24 months cattle were raised in local enterprises in the Ardahan and diagnosed with papillomatosis. Animals with papillomatosis were divided into two groups, 10 control and 10 experimental groups. During the experiment, the animals were kept under equal conditions in terms of care and nutrition (fodder and tap water as ad libitum). The gasoline was sufficiently sprayed to wet the papillomas of the cattle in experimental group twice a day in the morning and evening. This procedure was continued for fifteen days. During the application, the animals in the control and experimental groups were examined by starting from day 0 and their respiratory, pulse, body temperature and rumen movements were counted at three days intervals. Likewise, blood samples were taken at intervals of three days and some hematological controls (hematocrit, hemoglobin and leukocyte cell counts) were performed. Total leukocyte and formula leukocyte count were performed with hematocrit micro method in Thoma lame with white blood reconstitution pipette and the amount of hemoglobin was determined by Sahli method (Aktümsek and Zengin, 2011). Following the application that lasted for fifteen days, the animals were monitored for fifty days at one-week intervals. The number of animals that showed clinical recovery during this period was noted.

Statistical analysis: Microsoft Windows SPSS 10.0 computer program was used in the statistical evaluation of the data obtained as a result of the research. The normal distribution state was checked with the Shapiro-Wilk test. As the data showed normal distribution at the end of the test, the comparison of the parameters between the groups was done with unpaired t test. The obtained results were presented as mean and standard deviation (SD) and evaluated statistically. In the study, $P<0.05$ was considered statistically significant.

RESULTS

During the study period, general examinations and some blood parameters of the animals belonging to the control and experimental groups were at normal levels and the relevant data are presented in Table 1 and 2. The recovery status of papilloma lesions in animals in both groups is shown in Fig. 1. The number of recovered animals in both control and treated groups is shown in Table 3. Our results show that the animals in the control group did not recover while the animals in the experimental group recovered at the rate of 90%.

Fig. 1: Papilloma status before treatment and after treatment in control and treatment groups. (a, b: before and after treatment, d, e: before and after treatment and c, f: uncured animals in control group).

Table 1: General examination findings during the application of cattle

Parameters	Groups	Day 0	Day 3	Day 6	Day 9	Day 12	Day 15
Rumen/5 min.	Control	7.7±1.49	8.0±1.63	7.9±1.66	7.4±1.5	7.3±1.82	7.8±1.75
	Experimental	7.7±1.41	8.1±1.19	7.2±1.54	7.9±1.37	7.6±2.22	7.7±1.76
Pulse/ min.	Control	72.0±5.8	70.4±4.35	71.1±7.54	69.9±4.14	70.9±8.15	70.6±8.27
	Experimental	71.2±6.28	71.0±4.02	69.4±5.81	69.9±3.57	69.9±7.65	70.4±4.35
Respiration/min.	Control	16.1±2.92	15.8±2.1	15.7±2.05	14.8±1.87	17.6±5.16	16.0±4.35
	Experimental	15.5±2.22	15.6±1.64	15.9±1.96	15.5±1.71	17.9±4.62	16.1±1.52
Fever / ^{0}C	Control	38.34±0.26	38.16±0.30	38.2±0.35	38.3±0.25	38.38±0.26	38.50±2.86
	Experimental	38.37±0.26	38.44±0.39	38.29±0.26	38.43±0.36	38.42±0.28	38.34±0.24

Table 2: Blood parameters of control and treatment groups

Parameters	Groups	Day 0	Day 3	Day 6	Day 9	Day 12	Day 15
Neutrophils (%)	Control	37.0±1.33	35.20±3.11	34.0±3.33	30.9±3.54	30.10±4.30	32.70±4.13
	Experimental	37.30±1.33	35.80±2.29	34.60±2.63	31.3±4.71	30.30±4.27	30.40±3.86
Eosinophils (%)	Control	6.10±1.85	6.0±1.24	6.0±1.24	6.9±1.19	6.20±2.04	6.60±2.01
	Experimental	5.60±1.50	6.30±1.49	6.20±1.31	6.0±1.69	7.0±1.33	6.40±2.06
Basophils (%)	Control	0±0	0±0	0±0	0±0	0±0	0±0
	Experimental	0±0	0±0	0±0	0±0	0±0	0±0
Monocytes (%)	Control	3.90±1.19	3.80±1.13	4.0±1.56	5.5±1.43	5.40±1.07	5.20±1.03
	Experimental	4.20±0.91	4.20±1.31	4.90±1.91	6.0±1.15	6.0±1.15	6.0±1.24
Lymphocytes (%)	Control	46.10±2.13	45.5±3.10	41.0±6.46	46.1±3.14	46.70±3.88	45.0±3.16
	Experimental	46.4±1.89	44.4±2.50	40.0±3.91	45.10±3.24	45.50±2.46	44.50±2.54
Hematocrit (%)	Control	34.60±2.71	34.8±1.03	33.9±2.84	33.8±2.97	34.70±3.05	34.80±2.34
	Experimental	34.0±2.30	35.10±0.99	34.50±3.02	34.70±3.59	34.20±2.69	34.60±2.36
Hemoglobin (gr)	Control	9.50±1.43	10.30±1.56	9.80±1.22	9.40±1.07	10.30±0.94	9.70±1.15
	Experimental	9.90±1.52	9.60±1.34	10.00±1.24	10.10±1.37	9.80±1.22	9.40±0.84
WBC (/mm^3)	Control	7975.30±360.85	7975.3±360.85	8139.50±435.96	8080.3±493.72	7870.70±537.83	8684.10±595.51
	Experimental	8315.40±376.96	8315.40±376.96	8135.6±535.03	8060.60±665.42	8157.30±649.64	8900.0±580.47

Table 3: Number of recovered Animals by time

Groups	Day					
	15	22	29	36	43	50
Control (n=10)	0	0	0	0	0	0
Treatment (n=10)	0	1	2	3	1	2

DISCUSSION

As it is known, the immune system is of great importance for living things against diseases. Stimulation of the immune system in the treatment of this disease can give positive results. It has been suggested that autogenous vaccination, autohemotherapy, strengthening the immune system (levamisole and ivermectin) and direct application of some pomades on lesions are effective against jaw papilloma (Kale *et al*., 2018). It is seen that autohemotherapy method is used in the treatment of breast papilloma. In this method, 10 ml of 20 ml of blood taken from the patient's own vein is injected subcutaneously from the mid-lateral surface of the neck, and the remaining 10 ml of blood is intramuscularly injected from the gluteal region. When this application is repeated once a week and for four weeks, the lesions are reported to heal completely at the end of the sixth week (Nehru *et al*., 2017). It is suggested that podophyllin resin obtained from the roots of the plant named Podophyllum peltatum, used in the treatment of papillomatosis in humans, treats breast papillomas in dairy cattle when administered with autogenous vaccination. No recurrence has been observed at the end of this treatment. Therefore, it is reported that the application can be used safely in treatment (Kale *et al*., 2019). In the treatment of common papillomas on the body surface, it is known that 100% improvement occurs in 45 to 90 days when antiomalin is administered with 15 ml at 5 times and with an interval of 48 hours (Vijayasarathi *et al*., 2018).

As can be understood from the above studies, the treatment of skin papillomatosis in cattle is carried out by various researchers with different applications. No studies on the use of gasoline in the treatment of this disease have been found in literature reviews. In this study, it has been determined that the gasoline sprayed to cover the papillomas twice a day for 15 days stopped the growth of the papillomas, also necrotized the lesions, and as a result, the lesions were dried and disappeared. During the application and follow-up period, vital functions (respiration, circulation, body temperature, some blood parameters and rumen movements) were determined to be at normal values and no side effects (allergy, inflammatory changes in the area of application, necrosis of intact tissues) were observed. Since the beginning of the use of gasoline, the animals in the experimental group had not recovered till the day 15th, while 10% of the total animals on the day 22th, 20% on the day 29th, 30% on the day 36th, 10% on the day 43rd and 20% on the day 50th recovered and at the end of the day 50th, it was found that there was an recovery of 90%. There was no improvement in the follow-up of the animals in the control group for 50 days. Gasoline is known to be a hydrocarbon mixture. It contains pentane, hexane, heptane and octane (other hydrocarbons due to slight pollution). Cells convert these substances into alcohols then acids and aldehydes such as hexanone through oxidation. Alcohols react with cells and disrupt cell structures. They also irritate the area it touches, causing a inflammation. (Doğan, 2016). It can be said that its effect on papillomas is caused by the disruption of the cell structure of alcohols and the toxic effect of aldehyde derivatives. In addition, the stimulation of cells responsible for the immune system as a result of the inflammatory reaction caused by alcohols may have an effect. This study paves the way for the use of gasoline as an alternative medicine for the treatment of papillomas that spread to different parts of the body, are without stem, and cannot be treated with surgical operations. The gasoline is cheap and can easily be used on papillomas even by animal owners. This is an important advantage compared to other treatment methods (surgical intervention, stimulation of the immune system, use of some antibiotics, autohemotherapy, etc.). In addition, the fact that there were no negative effects on the animals applied to gasoline can be considered as a great advantage in terms of the treatment.

Conclusions: As a result, it can be suggested that gasoline has the potential to be used in skin papillomatosis of cattle thanks to the improvement in 90% of sick animals. In addition, in order to use gasoline as an alternative and safe drug in the treatment of skin papillomatosis, the topics such as which chemicals are effective in the structure, how they act (virusid, toxic effect on tumor cells, stimulation of the immune system, etc.) and whether different side effects occur are required to be investigated. The results of the research are thought to contribute to other studies on papillomatosis treatment.

Authors contribution: ED and AD conceived the concept. Blood samples were collected by ED and DE. The samples were analysed and interpretations by ANCD. ED and AD wrote the manuscript. The language was corrected by PAK. All authors approved the final version of the manuscript and declare no conflict of interest.

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