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Comparison of Different Therapeutic Protocols in the Management of Canine Transmissible Venereal Tumour: Review of 30 Cases

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Abstract: An investigation was made to compare the different strategies for treating canine transmissible venereal tumour. Total 30 dogs were included which fulfilled a pre-set criteria and randomly assigned to three groups (A-C) with 10 dogs in each group. Group A was treated with surgical excision, group B with chemotherapy and group C was treated with combination of both. In Group A, 30% dogs showed reoccurrence while Group B showed no reoccurrence with treatment span ranging from 4 to 7 weeks. Dogs in Group C recovered in shortest span of 4 weeks with no reoccurrence. Surgery combined with chemotherapy showed excellent results in short time followed by chemotherapy. But low costs and less invasive approach suggests Clinicians to rely on chemotherapy.

Key words: Canine · Vincristine Sulphate · Transmissible Venereal Tumour · Chemotherapy

INTRODUCTION

Canine transmissible venereal tumour (TVT), also called sticker's tumour, is a neoplasia which has origin of histiocytic nature [1]. It is transplanted from one dog to another dog through copulation or by direct contact [2]. It commonly localizes in external genitalia (i.e. vagina and prepuce) but can also occur in other body parts, i.e. oral cavity and nasal cavity, which come in contact with affected part [3, 4]. It has highest incidence in tropical and sub-tropical areas [5]. Unlike mammary tumours, it is not very common [6]. Like in humans, this cancer also makes a dog vulnerable to different deadly conditions [7]. It is mostly found in sexually active and adult dogs. On the other hand, dogs achieve their adult age at 6 to 24 months [8]. Common Signs involve excessive haemorrhagic bleeding from genitals and cauliflower like multilobulated nodules on the penis or in vagina that appears reddish and friable [5, 9, 10]. Being a benign tumour, it usually does not cause mortality [11]. Diagnosis involves histological, radiological, ultra-sound and near-infrared (NIR) optical tomography techniques. Histological methods are considered necessary in diagnosing a patient on initial stages and it is mostly adopted in developing countries [5, 10, 12-14]. Surgical excision, chemotherapy, radiotherapy and immunotherapy are considered as effective treatment regimens [15]. Depending upon experience and availability one or more regimes are used in combination [5, 16, 17].

This study was aimed to evaluate the different cost effective therapeutic strategies to treat TVT in field conditions. This study reviewed the treatment therapies in 30 cases of TVT and especially efficacy of medicinal treatment alone and in combination with surgery was seen to evaluate complete healing of metastatic lesions.

MATERIALS AND METHODS

From March 2011 to June 2012, thirty dogs of different breeds, ages and weights were included in present study that fulfilled pre-set criteria i.e. dogs must not be neutered, dogs should exhibit clinical signs and confirmed by cytology, the owner must allow the treatment strategy allocated to their animals, dogs

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exhibiting the signs of any other fatal disease should not be included and dogs must not have any prior history of this tumour. These selected dogs were randomly divided into three groups, A-C each group having 10 animals.

Group A (Male=3, Female=4) was treated with only surgical removal of tumorous growth. Dogs were given general anaesthesia then surgical debulking was performed. Surgical debulking involved the removal of all the nodules surgically and the complete dressing afterwards. Group B (Male=6, Female=4) were treated solely by intravenous administration of Vincristine Sulphate (Pharma Cristin - Lawrence Pharma and Co.) at the dose rate of 0.025 mg/kg body weight for 6 weeks at alternative weeks.. Group C (Male=5, Female=5) followed the strategy involving both the surgical de-bulking and chemotherapy. Chemotherapy i.e. vincristine was given up to 3 shots with weekly interval after 1 week of surgery. All of these dogs were kept in the clinic for 4 to 6 hours after any strategy applied to observe any side effects or haemorrhage. These dogs were regularly monitored for recurrence and medicinal side effects on weekly basis up to 6 months. The owners were directed to maintain all the hygienic conditions after the surgery. They were also oriented to report any behavioural changes. To minimize the risk of non-responsiveness, it was ensured that none of the dogs would miss any shot of vincristine. Evaluation of surgical treatment response in first month was categorized in two categories i.e. growth (G) and no growth (NG). On the other hand, evaluation of medicinal treatment response categorized as complete response (CR) and partial response (PR). The categories of recurrence (R) and no recurrence (NR) were utilized to evaluate the final results after the follow up period of 6 months.

RESULTS

The results of this study are shown in Table 1, 2, 3 for group A-C. In Group A (Mean age 5.2±1.54, mean weight 30.5±7.01), about 40% dogs received good surgical approach and their surgical de-bulking was easily done. In remaining ones, three dogs displayed macroscopically visible growths which further lead to recurrence of the tumour. Such patients were treated with vincristine afterwards until the tumour was regressed.

Table 1: Group A comprising on the cases which were selected for surgical excision

Breed	*Sex*	*Age (Years)*	*Weight (kg)*	Lesions Sites	Nodule Diameter (cm)	Response after the treatment period (1 Months)	Response after the follow up period (6 Months)
German Shepherd	*Female*	*5*	*33*	Vagina and Vulva	4.3	NG*	NR**
Grey Hounds	*Female*	*4*	*23*	Vagina and Vulva	4.7	NG	NR
Mongrel Dogs (Bully)	*Male*	*5*	*43*	Base of Penis	2.5	NG	NR
Grey Hounds	*Female*	*3*	*20*	Posterior Vagina	5.2	G*	R**
Labrador	*Female*	*6*	*35*	Vagina and Vulva	2.8	NG	NR
Grey Hounds	*Female*	*7*	*30*	Vagina and Vulva	5.1	G	R
German Shepherd	*Female*	*6*	*37*	Vagina and Vulva	4.9	NG	NR
Grey Hounds	*Male*	*8*	*32*	Base of Penis	2.8	NG	NR
Labrador	*Female*	*4*	*28*	Vagina and Vulva	3.9	G	R
Grey Hounds	*Male*	*4*	*24*	Base of Penis	1.2	NG	NR

* Growth = G ; No Growth = NG.

**Recurrence = R ; No recurrence = NR.

Table 2: Group B describing the selected cases for Chemotherapy

Breed	*Sex*	*Age (Years)*	*Weight (kg)*	Lesions Sites	Nodule Diameter (cm)	Nodules Diameter after 1 Month Treatment	Response after the treatment period (1 Months)	Nodules Diameter after 6 Month Treatment	Response after the follow up period (6 Months)
Labrador	*Male*	*3*	*27*	Base of Penis	2.1	0	CR*	0	NR**
Labrador	*Male*	*5*	*33*	Base of Penis	2.5	0	CR	0	NR
Grey Hounds	*Male*	*4*	*27*	Base of Penis	2	0	CR	0	NR
German Shepherd	*Female*	*2*	*19*	Posterior Vagina	4.3	0.9	PR*	0	NR
Grey Hounds	*Male*	*6*	*30*	Shaft of Penis	1.1	0.4	CR	0	NR
Labrador	*Female*	*7*	*38*	Posterior Vagina	3.5	0	CR	0	NR
Grey Hounds	*Female*	*3*	*21*	Posterior Vagina	3.7	0.3	CR	0	NR
Grey Hounds	*Male*	*5*	*25*	Base of Penis	2.3	0	CR	0	NR
Labrador	*Male*	*4*	*31*	Base of Penis	1.9	0	CR	0	NR
Labrador	*Female*	*6*	*37*	Vulva	4.1	1.1	PR	0	NR

* CR=Complete Response; PR=Partial Response

**Recurrence (R) and no recurrence (NR).

Table 3: Group C subjects which followed the strategy of surgery and chemotherapy

Breed	*Sex*	*Age (Years)*	*Weight (kg)*	Lesions Sites	Nodule Diameter (cm)	Nodule Diameter after 1 Month Treatment	Response after the 1 Month	Nodule Diameter after 6 Month Treatment	Response after the follow up period (6 Months)
Grey Hounds	*Male*	*7*	*28*	Vulva	4.1	1.1	PR*	0	NR*
Mongrel Dogs (Gaddi)	*Female*	*4*	*35*	Base of Penis	3.1	0	CR*	0	NR
Mongrel Dogs (Bully)	*Female*	*4*	*39*	Vulva	3.2	0	CR	0	NR
Grey Hounds	*Male*	*4*	*26*	Posterior Vagina	4.5	0	CR	0	NR
German Shepherd	*Female*	*4*	*27*	Base of Penis	2.9	0	CR	0	NR
Labrador	*Male*	*4*	*35*	Posterior Vagina	4.3	0	CR	0	NR
Grey Hounds	*Male*	*3*	*23*	Base of Penis	3.2	0	CR	0	NR
Labrador	*Female*	*5*	*32*	Base of Penis	3.4	0	CR	0	NR
Grey Hounds	*Female*	*5*	*29*	Vagina and Vulva	4.9	0	CR	0	NR
German Shepherd	*Male*	*5*	*30*	Vagina and Vulva	5.1	0	CR	0	NR
Grey Hounds	*Male*	*7*	*28*	Base of Penis	3.6	0	CR	0	NR

* CR=Complete Response; PR=Partial Response.
**Recurrence (R) and no recurrence (NR).

Fig. 1: Tumour lesions in the start of treatment.

Fig. 2: Tumour lesions in the ending phase of treatment.

In Group B (Mean age 4.5±1.58, mean weight 28.8±6.26), tumours in 2 dogs regressed by injecting vincristine weekly up to 4 weeks while in other 4 dogs regression occurred after the 5th shot (Fig 1 and 2). The remaining 4 dogs in the group did not respond well to treatment. The treatment span prolonged up to 7 shots in these dogs. But the tumour was regressed totally in the end and no recurrence was noted up to 6 months post treatment period.

Subjects selected in the group C (Mean age 4.7±1.2, mean weight 30.18±4.67) responded well to the treatment and no recurrence was observed in 6 months follow up period. None of the dogs received more than 3 shots of vincristine. All the dogs treated were completely cured and healthy.

The subjects received medicinal treatments were at risk of developing the side effects caused by Vincristine sulphate. Among all the patients 30% of the dogs developed the mild side effects like vomiting, hair loss and weight loss. Most of these patients were managed with the help of anti-emetics and dietary supplements.

DISCUSSION

The ultimate aim of all the related therapeutic strategies is to cure the tumour completely, which can be achieved by surgical excision, radiotherapy, immunotherapy or chemotherapy [5]. The selection of therapeutic strategy is one of the great deals. It depends on the clinician's experience, geographical circumstances, cost effectiveness and availability [3, 18, 19].

Diagnostic technique directs the decision of any clinician to decide the therapeutic strategy [13, 18]. Although radiography, ultrasound and near-infrared (NIR) optical tomography has been utilized for diagnosis but in field conditions histology is considered as more reliable and applied [2, 18, 20]. This study also diagnosed the cases on the basis of histology which is more applied and considered reliable in sub-tropical conditions of Pakistan. Surgical approach alone is not so much effective as high rate of recurrence is reported. Current study has also reported the recurrence in 30% of the subjects that are following the surgical therapeutic protocols. This study is in accordance with the all previously reported studies [5, 21].

Different studies evaluating chemotherapeutic protocols expressed different results according to their environmental conditions [22]. Most of the studies have documented the vincristine as a successful agent with least recurrence, good response and little side effects. Our findings are in accordance with all the studies which have found little or no recurrences [5, 20, 23-25]. Some studies have also discussed Doxorubicin as a chemotherapeutic agent but it is widely accepted that doxorubicin has more side effects than vincristine and hence, used as second choice [3]. Some studies have also implied multiple chemotherapeutic agents and combination of drugs but vincristine was proved much better than all of those [26].

Previously surgical approach combined with vincristine was observed as a good approach in Pakistani geographical conditions [21]. But in current study, both the therapeutic strategies gave satisfactory results with no recurrence which provides a choice to field practitioners in selecting one of the protocols according to their needs.

Radiotherapy and immunotherapy were considered as the latest approaches. These therapeutic protocols have less recurrence rates with short treatment period [5, 14, 27, 28]. Due to high costs and less availability, both techniques are not used as treatment therapy in routine clinical cases. Hence, these techniques were not compared in this investigation. Recently autogenous vaccines have also studied for the treatment of TVT acquired dogs. But could not performed well [18].

CONCLUSION

In the present study, both the treatment strategies i.e. only chemotherapy and surgical de-bulking along with chemotherapy gave the satisfactory results in field conditions. There were no recurrences and good response was recorded. On the other hand, only chemotherapy is proved to be easy, less intensive, cost-effective and quick procedure but there are chances of recurrence and side effects.

All therapeutic strategies are good depending on severity of lesions and prognosis of the case. On the basis of short recovery period surgery combined with the Vincristine has proved to be excellent therapeutic strategy in current study. On the other hand, due to less invasive approach and cost effectiveness chemotherapy is accepted as very effective strategy. This therapy is suited well for those owners who are hesitant to go for surgery.

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