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## Efficacy of autogenous vaccine therapy for bovine papillomatosis

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### Abstract

Bovine papillomatosis is a viral disease of cattle characterized by development of multiple cutaneous benign tumours termed warts. Cattle are the main source and natural reservoir of infection by the virus. The diagnosis of bovine papillomatosis was confirmed by clinical examinations of the warts. Thirteen animals reported to Veterinary Clinical Complex were selected for the study. The prevalence was found to be higher in the females (76%) than males (25%). The incidence was highest above one year old (84.61%) with various sizes of pedunculated, multiple, cutaneous warts on various parts of the body including udder and teats. All animals were subjected to surgical excision of growths under xylazine sedation and 2% lignocaine local infiltration by taking all aseptic precautions. Collected wart samples were subjected to autovaccine preparation using 0.5ml of 10% formalin. All cattle were treated with 10 ml of autovaccine by intramuscular route for 5 weeks on weekly interval. Regression study was carried out every week. Ten out of thirteen cases showed regression at 4<sup>th</sup> week (76.92%) One out of thirteen cases showed regression at 5<sup>th</sup> week (7.69%). Complete regression was noticed on 5<sup>th</sup> week (61.53%) in eight animals and 6<sup>th</sup> week (23.07%) in three animals. The present study showed 84.61% of efficacy for bovine papillomatosis using autovaccine.

**Keywords:** papillomatosis, cattle, wart, autovaccine

### Introduction

Cutaneous Bovine Papillomatosis or wart is a highly contagious viral disease caused by bovine papillomavirus (BPV) occurring more commonly in young cattle than any other domestic animal. BPV induces disease of economic importance, leading to significant economic loss to the farmers. Papillomas are most commonly seen on the nose, chin, lips, neck, shoulder, brisket, teat and udder. The presence of warts on skin of different body parts diminishes the value and aesthetic look of the animal. Cutaneous forms of papilloma are caused by BPV 1, 2, 3, 5, 6, 7, 8, 9 and 10 subtypes. Surgical intervention plays a limited role if the lesion is multiple and involving a large area. Papillomas most often regress spontaneously. However, it may occasionally persist and in the presence of additional critical genetic or environmental factors, can progress to cancer (Campo *et al.*, 1994) [2].

Warts are host, tissue and species specific so that immunity to one of them does not necessarily confer immunity to others. Though different treatment methods were available formalinised inactive vaccine proved to be effective against bovine papillomatosis.

### Materials and Methods

#### Selection of animal

Cattle reported to VCC, VCRI, Tirunelveli with the history of wart lesions were selected for the study.

#### Collection of sample

Wart lesions were collected at 2 or 3 sites per animal under aseptic preparation. Under xylazine sedation at the dose rate of 0.05 mg- 0.1 mg/ kg body weight and 2% lignocaine local infiltration around the wart lesion the representative samples were collected aseptically. Bleeding points were ligated using catgut.

#### Preparation of autovaccine

Wart lesions were collected from all the thirteen animals. The process was carried out under sterile conditions.

The collected wart tissues were washed thoroughly with sterile PBS and cut into small pieces and triturated with saline. Then the suspension was centrifuged at 3000rpm for 30 minutes to remove the coarser particles and filtered using Whatmann filter paper. Formalin was added at a concentration of 0.5ml of 10% formalin for 100ml of filtered solution and then antibiotics (Streptopenicillin 2mg /ml) added. The filtrate was kept in incubation for overnight at 37 °C to inactivate the virus. As a sterility checkup, the vaccines was inoculated on nutrient agar and incubated at 37 °C for

48hrs. Vaccines were Stored at 4 °C until use.

#### Administration of autovaccine

Ten ml of Autovaccine were administered through intramuscular route on weekly interval for 5 weeks.

#### Regression study

The animals were examined for the reduction of the wart size or occurrence of new warts in the any other parts of body.

#### Results

**Table 1:** Breed, age and sex wise distribution

Case no.	Breed	Age	Sex	Location of lesion
1.	Jersey cross	3 yrs	F	Head, dorsum, shoulder
2.	Non –descript	3yrs	F	Hindlimb
3.	Jersey cross	2.5 yrs	F	Hindlimb, tail
4.	Holstein fresian cross	3yrs	F	Neck
5.	Jersey cross	3 yrs	F	All over the body
6.	Jersey cross	2 yrs	F	Brisket, Axilla
7.	Non –descript	3 yrs	M	Axilla
8.	Non –descript	3 yrs	M	Head
9.	Non –descript	2 yrs	F	Head
10.	Kangeyam	3 yrs	M	Head
11.	Holstein fresian cross	1 yr	F	Head, Neck, shoulder
12.	Jersey cross	1yr	F	Head, Neck, shoulder, vagina
13.	Non –descript	3 yrs	F	Udder and teat

**Table 2:** Treatment response to autovaccine

Case no.	No. of doses given	Response to treatment	Complete regression	Current status of the animal
1.	4	No regression	No regression	Sold the animal
2.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Calved
3.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Pregnant
4.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Pregnant
5.	4	No regression	No regression	Sold the animal
6.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Calved
7.	5	4 <sup>th</sup> week	6 <sup>th</sup> week	Draught
8.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Draught
9.	5	4 <sup>th</sup> week	6 <sup>th</sup> week	Pregnant
10.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Draught
11.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Heifer
12.	5	4 <sup>th</sup> week	5 <sup>th</sup> week	Heifer
13.	5	5 <sup>th</sup> week	6 <sup>th</sup> week	Pregnant

#### Discussion

Bovine papillomas are caused by Papillomaviruses and currently 14 recognized types of bovine Papillomavirus (BPV) have been identified (MacLachlan and Dubovi, 2017). They are topographically specific and the BPV having different antigenicity and nucleic acid compositions. Therefore a vaccine providing immunity to one of them does not confer immunity to other (Sreeparvathy *et al.*, 2011) [9]. BPV are small DNA, non enveloped virus with an icosahedral capsid around 50-60nm in diameter. Nasir and Campos (2008) [6] reported that cutaneous form of papilloma is caused by BPV 1-3 and 5-10. BPV 1 and 2 infect the fibroblast of the underlying dermis and cause fibro papilloma of skin, udder and teat.

In the present study incidence of bovine papillomatosis was higher in females than male. This is in accordance with Hammad *et al.* (2017) who also reported that the incidence rate of bovine papillomatosis was significantly higher in females than in males. They suggested this might be due to stress induced by gestation and lactation

Animals reported in the study were mostly above one year of

age. Among 13 cases (11) wart lesion was persistent for 2 months without any sign of regression. This correlates with findings of (Inayat *et al.*, 1999) [4] who stated that though papillomatosis is a self-limiting disease, long lasting multiple papillomas without any sign of regression for months also persist which may sometimes leads to cancer. According to (Campo *et al.*, 1994) [2] and (Inayat *et al.*, 1999) [4] several factors contribute to the occurrence of papillomatosis viz., inheritance, hormonal disorder and suppressed immune system.

In this study different forms of wart lesions were recorded viz clusters of papillomas, solitary papilloma of several millimeters in size, multiple, pedunculated, grey to black. This coincides with (Singh *et al.*, 2009) who reported cutaneous papillomas usually appear as multiple, sessile or pedunculated, circumscribed grey-white to dark brown black outgrowth, which may be smooth surfaced, spherical or horny. Their were different forms viz flat, broad base, filiform, rice grain like, others were conical, growing on a pedicle and some others appeared cauliflower like on the surface of the skin. Size of the wart could not be measured as

they were in different sizes in the same animal.

Sreeparvathy *et al.*, 2011<sup>[9]</sup> stated that the animal was treated with a dose of 5 ml subcutaneously and re-vaccinated at 7 day intervals for four weeks. Administration of autogenous vaccine caused sloughing of the warts from the affected areas and the animal recovered completely in six weeks. According to Swamy Babu (2020)<sup>[1]</sup> adult animals were administered with 10 ml of autovaccine and calves with 5 ml subcutaneously weekly once for 4 weeks and observed for regression of warts. The animals were treated by autogenous vaccine administered in doses of 0.5 ml i/c and 10 ml s/c, and twice revaccinated at 10-day intervals. Nenadturkl *et al.*, 2005 in his study results showed regression of papilloma occurred about 3 weeks after the beginning of treatment, and within 6 weeks all warts spontaneously disappeared and animals completely recovered. In the present study 50 ml of vaccine could be prepared from the sample collected, so dose was fixed to 10ml/week for 5 weeks. Vaccines were stored at 4 °C. According to Philip (2000) *in vitro* and *in vivo* studies on both human and animal papillomaviruses showed that antibody responses occur in the natural infection and that antibodies to conformational epitopes on the viral capsid can neutralise viral infectivity in a type specific manner. Humoral immunity appears to play little part in wart regression.

Ten out of thirteen animals showed regression at 4<sup>th</sup> week (76.92%) One out of thirteen cases showed regression at 5<sup>th</sup> week (7.69%). Complete regression was noticed on 5<sup>th</sup> week (61.53%) in eight animals and 6<sup>th</sup> week (23.07%) in three animals. Two animals were sold during treatment period due to lack of patience of the owner to complete the 5 doses, no improvement in regression and not able sell the milk from the animal due to its aesthetic look. The present study showed 84.61% of efficacy for bovine papillomatosis using autovaccine.

Turk *et al.*, (2005)<sup>[11]</sup> reported that treatment with autogenous vaccine produced from formalinized suspension of wart tissue showed 93.5% efficiency. Hammad *et al.*, (2012) studied the treatment efficacy of autogenous vaccine, New Castle disease virus and cell culture vaccine against bovine papillomatosis. His study result showed New Castle disease virus gave a better response within a shorter period of time (30.1 days) when compared with the treatment by autogenous vaccine (45 days) or heterogenous cell culture vaccine (43.8 days). The cure rate of cutaneous papillomatous growths through surgical excision was higher than after application of autogenous vaccine. (Terziev *et al.*, 2015)<sup>[10]</sup>. Rakesh Ranjan (2013)<sup>[8]</sup> suggested that autogenous vaccine is useful for therapeutic purposes in bovine papillomatosis and auto-hemotherapy can serve as an useful adjunct by enhancing regression rate of papillomas.

## Conclusion

A total of thirteen cases of bovine papillomatosis had been recorded in the study period. 10 ml of autovaccine per animal per week for five weeks had been standardised. The regression study showed that the average time taken for complete regression of lesion takes around 5-6 weeks. Autovaccine therapy proved to be effective treatment for bovine papillomatosis. The therapeutic modality are low cost and easy to follow, hence can be used at field level.

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