Clinical and therapeutic studies on Bovine Papillomatosis in Al-Najaf Province, Iraq.

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Abstract

Bovine papillomatosis is a contagious viral disease of skin and mucosa, characterized by growth of multiple benign tumour named warts, caused by BPV types 1 to 10. The diagnosis performed by clinical and pathological examinations of the lesion. The prevalence of bovine papillomatosis in A-Najaf was 2.68 %. The most frequent location of the lesions was on the neck, back, right side of the face, around the eyes and the least frequent is the body as a general. Autogenous vaccine therapy was evaluated, in which the lesion was taken from the animal and prepared then injected into the same animal to treat it. Each animal was given three doses, each week the animal injected one ml of the vaccine given intradermally. About 90% of papilloma lesions were disappeared (cured) one month after the third dose of the vaccine in the same animal that we took the lesion from it, while it was 70% after a five weeks of last dose of treatment in cases that treated with a vaccine prepared from another animal. We concluded that there is a considerable prevalence of bovine papillomatosis in the region, and the therapeutic effect of the vaccine on the same animal is more rapid and definitive than that of another animal, this allowed recommending of using vaccine of multiple strain of virus in the vaccine preparation.

Key words: Bovine, Papilloma, Autogenous vaccine


Introduction:

Papilloma (Wart) is a benign epithelial chronic tumor of skin and mucosa, caused by papilloma virus affect animals and human being, and can spread throughout body under special circumstances(1). The skin type of wart has a worldwide distribution. It is a transmissible disease that occurs in several species and the causative virus species-specific with the possibility of excluding the strains that infect cattle (2).

The disease in cattle is caused by bovine papilloma virus, belong to the papilloma genus and papovaviridea family, which is responsible for the natural infection of the host(3).

There is a partial cross antigenicity between the different strains of the virus in the genus of papilloma virus (4).
Constable et al. 2016 noted that 25% of pure cattle breeds may infected with skin wart, while Olson et al. 1969 noted that 75% of cattle herds can be infected with it, so it has a health importance (5,6).

Tweddle and White 1977 recorded an infection rate reached 47% and most lesions subsided within the next 16 weeks (7).

Wart occurs in cattle at all ages, but severe infection occurs in young ages (in the first year of life) and the prevalence were more in cows of indoor feeding than the outdoor one (5).

The transmission occurs by direct contact with the infected animal, where the infection inters through skin abrasions, sometimes around the ear mark or along the scratch due to wires and a tattoo machine, dehorning, and castration (8).

The wart can cause bruising and wound to the host, leading to secondary bleeding or bacterial infection. When the wart is located on the penis of the bulls is lead to bleeding after the process of intercourse and the animal may reject intercourse (9).

Wart can interfere with the sale and affect it because of the unwanted appearance of the infected animal. The severely infected animal can lose its health, and the wart on the udder and teats will interfere with the milking process. In horses, small lesions cause discomfort (10).

The disease is self-limiting, and the large animal is less susceptible to infection than small animals, due to acquired immunity from both apparent and latent infection in the early stages of life which induce a solid immunity that persists for two years. Spontaneous recovery is common and takes about 5-6 months and sometimes 18 months to be cure (Woodman et al. 1986; Meischke 1979).

The recurrence of wart infection in healing animals from normal infection after two years, indicating that the disease does not give permanent immunity to healing animals, which explains the observations of some researchers that the immunity completed after 18 months (13,14).

There are many methods have been employed to treat the bovine papilloma lesions such as surgical removal, keratolytic agents, and autogenous vaccine (15). There are few reports about combined therapy of bovine papillomatosis using the autogenous vaccine and a parammunity inducer in cows (16).

The vaccine prepared from the wart tissue of the infected animal is effective in eliminating or controlling the spread of the disease (17).

The most effective vaccine is that prepared from the papilloma lesions treated with formaldehyde (18).

Therefore, in present preliminary study, prevalence and clinical aspect of the disease, and an autogenous vaccine trial in cattle in the same individual and between different animals was conducted to monitor the clinical response and changes in the wart lesions in order to obtain a better insight into papillomatosis treatment by autogenous vaccine in cattle.
Materials and methods:

This study was conducted on 20 calves distributed in 6 herds in Al-Najaf province in Iraq. The total number of herd and the number of infected animals was reported with a full description of the lesion, its locations, number and size. Then some lesions were selected for the preparation of the autogenous vaccine as follows:

Normal saline was added to the lesion by a ratio of (10) ml of N.S. to (1) gram of lesion, then the lesion was cut into small pieces with scissors and crushed with ceramic mortar and pestle. The solution filtered by gauze and 0.5 ml of 10% formalin is added to 100 ml of the solution. The solution incubated at 37 °C for an hour. Then a sample of this solution is cultured on the blood agar to test the sterility of it from the bacteria. Then adjust its PH at 7.0 by a pH meter.

The affected calf injected intradermaly by 1 ml of the prepared autogenous vaccine for three times, a week interval. The vaccine was injected into the same animal from which we took the lesion, the vaccine was also used with another calves infected with the same disease to find out the response to the vaccine prepared from other animals of the same species. Treated animals were monitored weekly for five weeks after the last dose, and the response to treatment with the gross changes of the papilloma lesions was recorded, the treated cases were compared to control groups infected with the same disease.

Results:

The results showed that the prevalence of papilloma infection was 2.68%.

The most frequent location of the lesions was on the neck followed by legs, back, right side of the face, around the eyes.

Our results showed that 90% of papilloma lesions were cured one month after the third dose of the vaccine of the same individual that we took the lesion from, in which 18 lesions out of 20 lesions were cured. Another case showed that 126 lesions were cured from a total of 150 lesions, or 84% four weeks after the last dose of treatment.

In cases treated with the vaccine prepared from another animal, the results showed an improvement rate of 70% after a five weeks of last dose of treatment, where an infected calf with 30 lesions in the same herd was treated with the vaccine from another animal in the same herd. Another calf was infected in the mucocutaneous region of the anus, where it showed a response to the treatment also. The gross characters of the treated lesions during treatment was dryness and cracking of the lesions with gradual regression and complete disappearance, while in mucocutaneous lesions, they did not get the total disappearance, and left only a small part of about 0.25 cm height while its height was about 1 cm before treatment.
Discussion:

Bovine papillomatosis is a contagious viral disease of cattle, affect the skin, caused by Bovine Papillomavirus (BPV), of ten serotype BPV-1 to 10. Infection by multiple BPV is common which is result in various shapes of the papilloma lesions in the affected animal (19).

There are many factors determine the pathogenesis of the disease include genetic factors, nutritional, hormonal, sunlight and immune suppression (20).

There is an important relationship between disease severity and immune status of the animal. Severe form mostly occurs in immunocompromised animals. This state is well recognized in human papillomatosis (21).

Papilloma most often recover spontaneously. Conversely sometimes it may persist and progress to cancer if an additional serious genetic or environmental factors presence (20).

The results showed that the ratio of papilloma infection was 2.68%. This agree with (22) who reported a ratio of 4.86%, and disagree with (23) who reported a ratio of 13.21% in cattle teat.

Constable et al. 2016 reported that the disease occurs at all ages, but highest infection rate occurs in young ages due to acquired immunity from apparent and inapparent infection in the early stages of life, as well as the breed and sex play a role in the incidence of infection (5). Also Constable et al. 2016 reported that 75% of pure cattle breeds may be infected with the disease (5). Madsen et al. 2017 reported that the prevalence of the disease is higher in indoor feeding cattle than outdoor feeding in addition to the predisposing factors that enhance the occurrence of the disease (24). An outbreak of cutaneous fibrous wart was happened after removal of horns in cows and also severe epidemic of anal fibrous wart after rectal palpation of the pregnancy test (7). The health and immune status of the animal play an important role in the incidence of the infection and the immunodeficiency may cause delayed in the recovery of the wart lesion (19).

The most frequent location of the lesions was on the neck followed by the back and right side of the face and around the eyes and the least frequent was on the other area of the body. This is due to the site specificity of the virus, the animal husbandry and management (25).

Wart lesions are most often seen on the udder of the lactating cows, and around the skin of the eyes, mouth, ears, neck and sometimes on the skin of male and female genitals in beef cattle (22).

Treatment of wart with autogenous vaccine led to the healing of the lesions in a good ratio. This agree with the result mentioned by (26), (22), (27), (16), who noted to the effectiveness of autogenous vaccine in the treatment of wart. (6) reported that the infection will exacerbate after vaccination, while (25) indicated that vaccination was ineffective.

Hungerford, 1990 reported that the self-administered vaccine gives an 80% cure rate of 10 ml under the skin and is repeated after 14 days at the same dose (28).
The vaccine prepared from the lesion tissue gives good immunity, while the vaccine prepared from the injected eggs gives little or doubtful immunity (29).

There seems to be a close relationship between the stage of the disease and vaccination process. At the last stage of the disease, the vaccine gives a good effect on the regression of the lesions, while it increases the size of the existing wart and prolongs the course of the disease when given in the early stage of the disease, because the wart has three reproductive stages: growth, development and regression (30,31).

The results of this study showed that 90% of papilloma lesions were cured after 5 weeks of treatment of the same individual that we took the lesion from, this agree with (15) who reported a rate of 93%, and disagree with (22) and (32) who reported a ratio of 100%.

The reason for the incomplete total healing of the treated lesions in the experiment may be due to the high content of fibrous tissue and the low content of epithelial tissue in some lesions, this is supported by (5).

Al-Ani et al., 2000 conducted an experiment to treat 13 horses with formalin-inactivated vaccine, where animals were treated with three doses, one dose every week, 0.5 ml of the vaccine given intradermally, and (3-5) weeks after the final dose, all the treated horses will cure compared to the control group that remained infected(32).

The virus can be obtained from the wart itself or tissue culture and caution should be taken in tissue selection because there is a multiple serotype and the cow commonly have more than one serotype of virus. Multiple types of tissue should be used in a single vaccine (25).

Treatment of infected calves with the vaccine prepared from lesions of another infected animal showed an improvement rate of 70% after a five weeks of treatment, (33) and (5) mentioned that there is partial cross-immunity between different strains of the virus.

In cases of mucocutaneous wart of the anus showed a response to the treatment by dryness and cracking of the lesions with tendency to healing, but did not get the total disappearance.

Tissue vaccine is capable of producing immunity in the epidermal tissue and not in connective tissue, so when experimental infection occurs there will be a slight external growth of connective tissue, and the antigenic variation of the virus serotype indicates possible difficulties in vaccination programs even when using the autogenous vaccine (5).

Conclusion:

The papilloma infection rate in the cattle and calves is not low, and require more attention and epidemiological studies. Cure rate of cutaneous papillomatosis by application of autogenous vaccine therapy was good and encouraging. The use of the vaccine to treat another animal has also given positive and encouraging results. The
therapeutic effect of the same animal was more rapid and definitive than that of another animal. This allowed recommending of using vaccine of multiple strains of virus.

References:

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