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Clinicoepidemiological study of bovine skin papillomatosis in Al hamza quarter-Al diwanya province

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Abstract

The aim of the present study was to describe the clinical faces and some epidemiological factors as well as histopathological aspects of natural occurring bovine cutaneous papillomatosis in Al hamza quarter-Al diwanya province. Out of 557 examined animals the percentage of papilloma was 21(3.77%) in both sex which were 3.5% and 3.9% for male and female respectively. Macroscopically, the lesion varies from 0.5 to 9 cm in diameter and black, grey or like surrounding skin color, also it vary in shape from pea-sized lumps to large orange-sized balls circumscribed shape, or irregular morphology. The head was occasionally site followed by the thorax , neck, . abdomen , hand limbs and udder (teat) were (42.9%),(28.5%),(23.8%), (19%),(14.2%) and (14.2%) respectively. Histopathological examination illustrated the presence of fibroblastic proliferation with overlying acanthosis, orthokeratotic hyperkeratosis and parakeratosis with hypertrophied sebaceous glands and thickening in the wall of the dermal blood vessels. The study also revealed there are significant variation among age groups, the (7months - 1 years) age group was high infection percentage followed by (13 months -2 years) and (6months calves and old animals more than 3years) were (7.84%), (4.25%), (1.8%) and (3.5%) respectively. animals were poor body condition(score 2) was sever effected by number and size of cutaneous papilloma tumor compared with animals have moderate and good body condition scores 3and 4.

Introduction

Bovine papillomatosis is a viral disease of cattle characterized clinically by development of multiple proliferative benign tumors termed warts caused by DNA oncogenic bovine papilloma virus (BPV) inducing hyperplastic benign lesions of both cutaneous and mucosal epithelia in cattle.(1, 2, 3). Bovine papillomavirus (BPV) is also considered the etiological agent of in oral, esophageal, respiratory, alimentary and urinary tract tumors (4) Papilloma viruses (PVs) are highly species and site specific pathogens of stratified squamous and/or non stratified epithelium (5), They are classified as mucosotropic or cutaneotropic (6). Bovine papilloma may be occurring in all ages (7 and 8) but mostly occurring in young cattle (9) The spread of the disease is usually via direct contact with infected animal and is entered to animal skin by cutaneous abrasions castration and injections.

Inheritance, nutritional and hormonal disorders, sunlight and suppressed immune system may play important roles in pathogenesis of disease (10, 8, 9, 11, 12, 13). The disease is gains its economic importance through interfering with animal sales and shows, as extensive bovine papillomatosis causes the animal to lose his condition specially when the lesions get infected secondarily with bacteria. Teat warts are also interfering with milking process (14). despite, most studies that aim for viral genotyping have been based on a PCR assay, studies involving occurrences and epidemiological features are uncommon. (15; 16). There for The aim of the this study was to describe the clinical, histopathological and some of epidemiological findings of naturally occurring bovine cutaneous papillomatosis.

Materials and Methods

Animals of study

This study was conducted with 557 different breeds cattle (359 females and 198 males) were free breeding in Al hamza quarter and their townships .it extended between January 2011 and Jun 2012. this study was involved all ages animals (from 1 day and above) and, in the presence of additional recorded along with, sex, age, body condition score of affected cattle, number and localization of lesions.

Body condition score

Most animal and dairy scientists acknowledge successfully manipulating BCS as an important management factor, influencing or having a relationship to animal health and relationship with infection and development papillomatosis the BCS in dairy cows is done using a variety of scales and systems. In this study using the USA system This method involves palpating the cow to assess the amount of

tissue under the skin. Scoring body condition by the 0-5 scales. (14)

Skin biopsies

After surgical removal of mass of papillomas obtained under local anesthesia (Lidocaine HCl),.the Parts of the tumors samples were immediately immersed in 10% formalin at room temperature for at least 1week before processing. Fixed specimens were dehydrated through graded alcohols and embedded in paraffin by routine methods. Sections were cut 4-5 μ m in thickness and were stained with hematoxylin and eosin (HE) (17). and examined with a light microscope equipped with an ocular micrometer (Olumps, Japan).

Statistical analysis

Chi square test was run to determine the influences of sex, ages and site statistical medium also used to test the body condition on occurrence of papillomatosis.

Results

The prevalence of bovine papillomatosis was found as 3.77% out of (21/557) examined animals, the sex was one of epidemiological factors of our study which demonstrated that the male and

female have been presented as 3.5% (7/198) and 3.9% (14/359) respectively statically there are non-significant differences were observed between both sex (Table 1)

(Table 1).the percentage of the cutaneous papillomatosis according to sex of animals

Animals	No.of animals	No. of affected animals	%
Male	198	7	3.5
Female	359	14	3.9
Tottal	557	21	3.77

Clinically the masses papillomas were growths vary in size and shape from 0.5 to 9 cm in diameter. dark black, grey or like surrounding skin color, also it vary greatly in shape from almost flat pea-sized lumps (that closely attached with skin surface) to large orange-sized balls on stalks or may be to pedunculated form with cauliflower or circumscribed shape, whereas some occasionally was irregular morphology

(figures 2,4,5). In some lesions seen in lower eyelid and teats were associated with bleeding and secondary infection. Histopathological examination of papilloma tumors biopsies is often characterized by the presence of fibroblastic proliferation with overlying acanthosis, orthokeratotic hyperkeratosis and parakeratosis. The strands of connective tissue covered by a hyperplastic epithelial layer (figure 1)

protruding from the body surface appearing cauliflower- like in cross section. The hyperplastic epithelium often obliterates other types of cell normally present in epidermis (figure 2) there were thick stratum basale layer with ballooning (vacuolization) of the cells (figure 4) and deposition of keratin (hyperkeratosis) with proliferation of fibroblast cells, also the results revealed accumulation of huge mass of collagen fibers in the stratum corneum layer (figure 5), with hypertrophied sebaceous glands (figure 6) and thickening in the wall of the

dermal blood vessels (figure 7). Papillomatosis can appear as a raised or nodular lesion occurring anywhere on the body surface, the head was occasionally site of infection was at percentage 42.9 % (9/21) (Table 2).which divided as (ear and rounded it, around the eyes and cheeks and muzzle were at the percentages (19%), (14.2%), (9.5 %) respectively) (figure 1). and followed by the thorax , neck, . abdomen , Hand limb and udder(teat) were (28.5%),(23.8%), (19%),(14.2%) and (14.2%) respectively (figure 2,3, 5,6,7 and 8).

Table 2. Distribution of bovine cutaneous papillomatosis according to their locations

Location	No	%
Head	9	42.9 (9/21)
ear and around it	4	19
around the eyes	3	14.2
cheeks and muzzle	2	9.5
neck	5	23.8
Thorax	6	28.5
abdomen	4	19
Hand limb	3	14.2
Udder(teat)	3	14.2

* Some cattle have more than one infection site

Calves aged between (7months -1 years) were high infection percentage (7.84%) followed by animals aged (13 months -2 years) was (4.25%) whereas the small animals less than (6months and old animals more than 3years) were low

infection at (1.8%) and (3.5%) respectively (Table 3). The statistical analysis revealed there are significant difference in prevalence rate between the age groups were higher in 7m-12m and relatively higher 13m -2years compared with rest age groups.

(Table 3).the percentage of the cutaneous papillomatosis according to age of animals

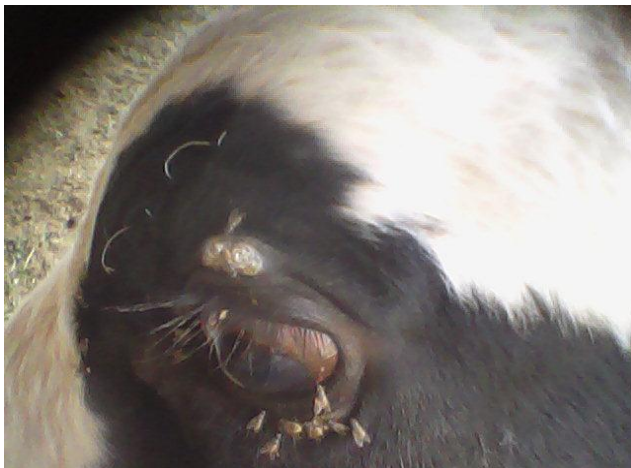
Age groups	No. of animals	No. of affected animals	%
1 day-6 months	111	2	1.8
7months -12 months	51	4	7.84
13 months -2years	141	6	4.25
3 years -above	254	9	3.5

The number and size of papilloma were influence by The body condition score .our result revealed that the score 2 was high medium ($\bar{x} = 7$), that animals were thin and poor body condition while the animals have scores 3 and 4 were at percentages ($\bar{x} = 2.7$)

(Table 4).the percentage of the cutaneous papillomatosis according to body condition of animals.

<i>Body condition scores</i>	<i>No. of animals</i>	<i>Range of papill. Mases in animals</i>	\bar{x}
Score 1	0	0	0
Score 2	7	3-9	7
Score 3	7	1-7	2.7
Score 4	5	1-12	2.6
Score 5	2	1	1

$\bar{x} = \text{medium}$.



(Figure:1) Macroscopic view of male bovine papilloma in upper eyelid



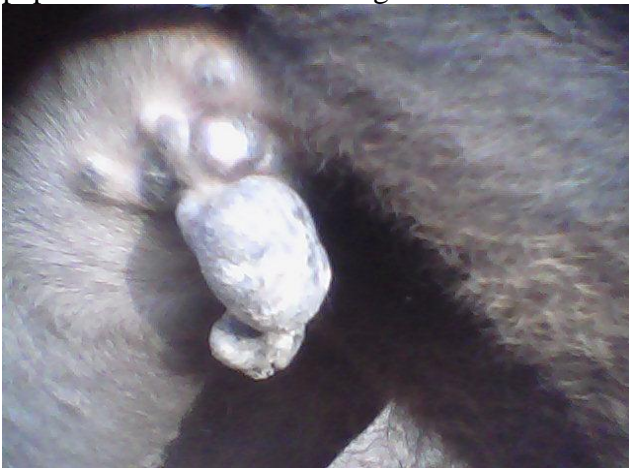
(Figure:2)) Bovine bearer of cutaneous papillomatosis with exophytic tumors located preferentially in the anatomic region of the, neck



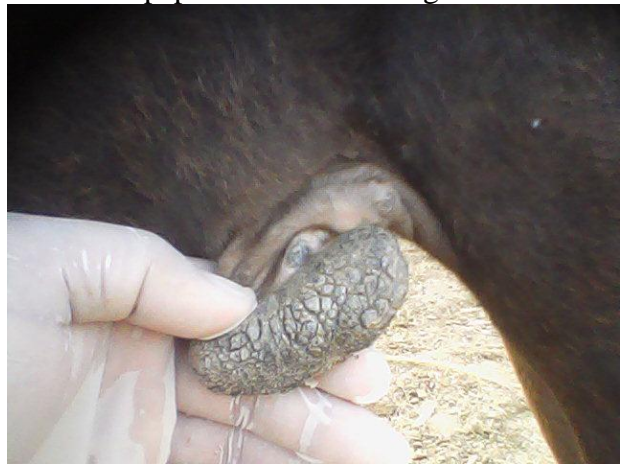
(Figure:3) Emaciated female with multiple papillomatosis in shoulder region



(Figure:4) Bovine bearer of blacking irregular cutaneous papilloma in dorsal region



(Figure:5) Multiple papillomas in 1 year i heifer disseminated on the abdomen nearest the udder measuring from 0.5 to 5 cm.



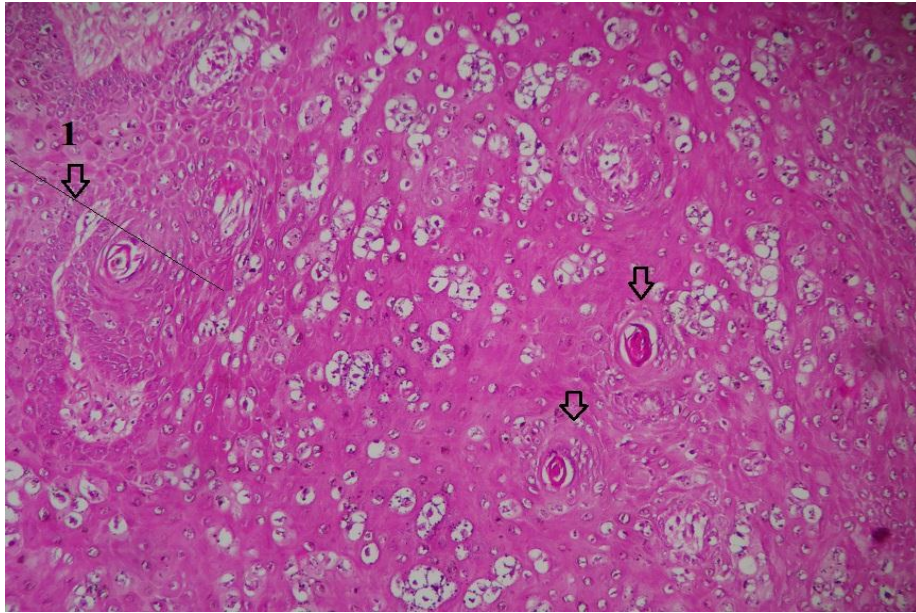
(Figure:6) large papilloma in abdomen region (in angle between abdomen and they



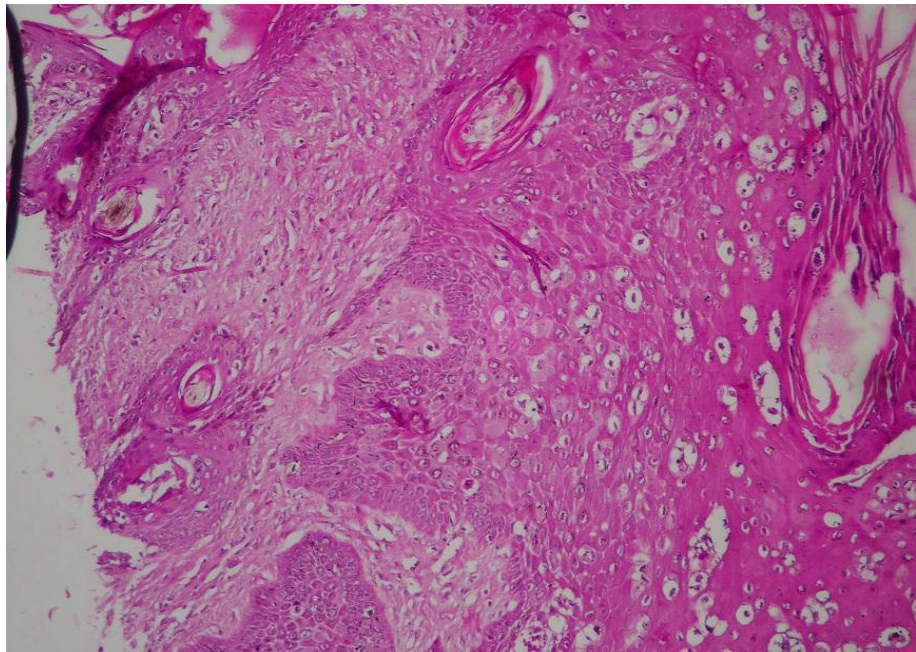
(Figure:7) a calf showing multiple large sized warts distributed in



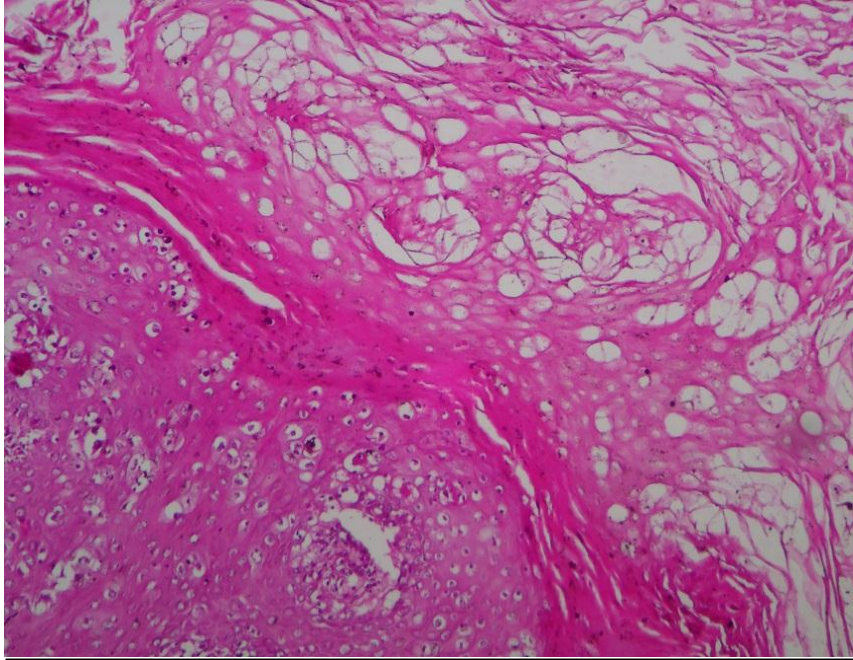
(Figure:8): a female calf showing papilloma in teat



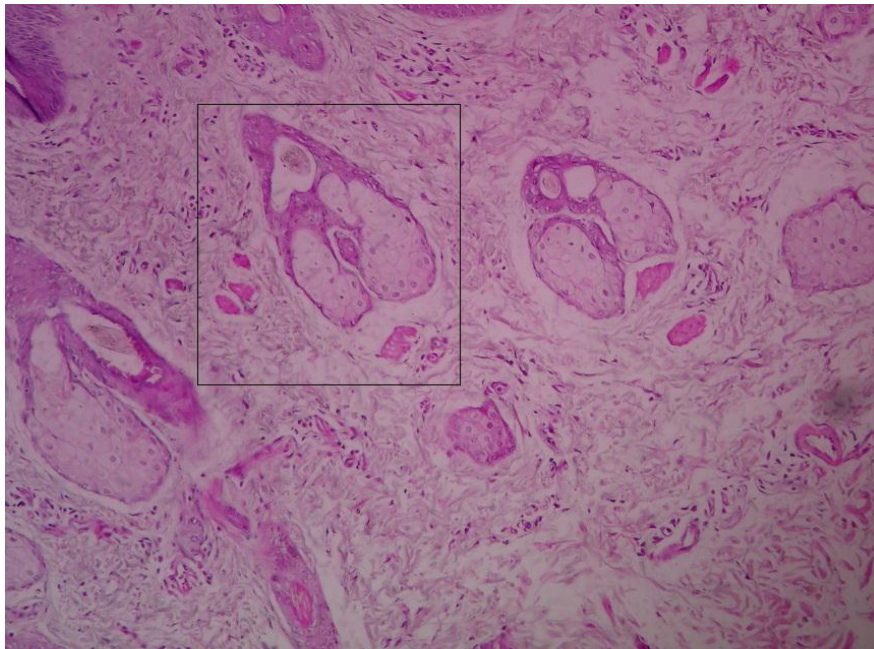
(Figure:10): skin papilloma, the section showed thick stratum basal layer(1) and deposition of keratin (black arrows) with proliferation of fibroblast cells. H&E, 100X.



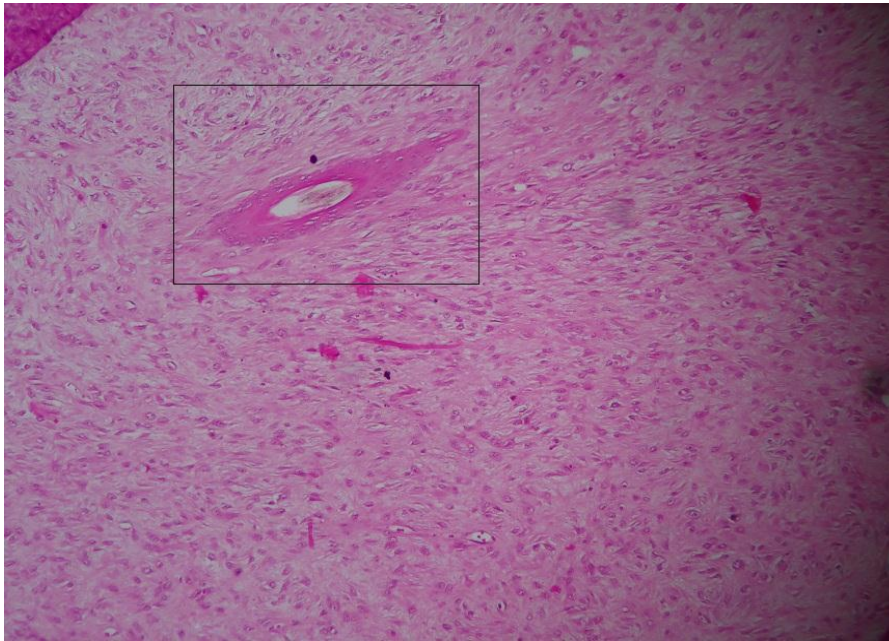
(Figure:11): skin papilloma; the section revealed hyperkeratosis with hyperplasia of epidermal layer and proliferation of fibroblast cells. H&E, 100X.



(Figure:13): skin papilloma, the section showed hyperplasia of epidermal layer with huge accumulation of collagen fibers in the stratum Corneum layer. H&E, 100X.



(Figure:14): section of skin papilloma showed hypertrophied sebaceous glands. H&E, 100X.



(Figure:15): section of skin papilloma revealed thickening of blood vessels wall. H&E, 100X

Discussion

bovine papillomatosis is uncommon diseases in restricted area of our study ,the prevalence rate have be shown in this investigation (3.77%) was including within range(3.0%-18.2%) that reported by (18)and relatively lower than (3) who viewed that the prevalence of bovine papillomatosis in Northern Oases was recorded as (4.86%) also it is more lower than (20-25%) that presented by (1929).whereas it higher than(2.25) that reported by (20) the low percentage of our study may be return to animals reared under smallholder and large-scale farming systems. Therefore, it is possible that traditional cattle have low papillomatosis burdens that conducted with study which restricted the spread of disease.In order to shed light on the macroscopic aspects relatively similar observations were made by different workers (21 and 22, 23). In spite of the papilloma was it less common occurred in the presented study showed the head was the mean sited of infection fallowed neck, thorax and abdomen then hand limb and udder(teat).this our founding was in

agreement with the(3,7,10 and 23).The factors have been studded their influence on bovine papillomatosis occurrence was include first, The role of sex in the infection may be reported that both six were equally susceptible to papillomatosis infection(3.5% and 3.7%) respectively, this result .are in agreement with the investigation made by (3) .who reported that the female was higher percentage than male were 14.8% and 7.3% respectively, the result of sex in the infection may return to the male and female cattle usually under same environmental and managements factors in farm .Second higher infection percentage (7.84%) that recorded was in animals that have 6 months to 2 years of age. Lower rate (1.8%) was observed in small animals . Similar results were also recorded by (3,4) also (15, 23,24) reported that cutaneous papillomatosis was detected in animals aged between 5 and 24 months Young animals are most commonly affected with warts and will eventually develop may be due to failure immune response against warts.The present investigation concerns the revealed the role of body condition score of

animals on the number and development of bovine papillomatosis. The study has shown that there are more opportunities of development of wart in animals have poor body condition (Emaciated animals), that have score 2 in agreement with the findings of (3) who reported that of heavily infected cattle with papillomatosis were infested with ticks, gastrointestinal worm and fasciola. Other researcher demonstrated by (25) that deficiencies of iron, molybdenum, copper and zinc, had been associated with persistent cutaneous papilloma, also in agreement with (26) the higher prevalence of papilloma in poor body condition of animals (emaciated animals) in our study was

recorded might be due to poor management such as malnutrition, or external and internal parasites that reflected on immune system in animals. In comparison with the other studies histologically the agreement with (23 and 27) as well as the density of the stratified scaly epithelium (hyperkeratosis) (28,29 and 30) as well as the other cases induced fibropapillomas that exhibited all the morphological characteristic lesions consist of hyperkeratosis and proliferation of the thorny stratum (acanthosis) and growth in depth under the form of epithelial growth in a massive dermal proliferation and down-growth of rete ridges that were registered (31 and 32)

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دراسة سريرية وبائية لمرض الثالوث الجلدي في الأبقار في قضاء الحمزة في محافظة الديوانية

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الخلاصة

هدفت الدراسة الحالية لتوضيح الأوجه السريرية وبعض العوامل الوبائية بالإضافة الى التغيرات النسجية المرضية للإصابات الطبيعية بالثالوث الجلدي في الأبقار في قضاء الحمزة في محافظة الديوانية. بينت الدراسة ان نسبة الإصابة كانت (٣.٧٧%) من ٥٥٧ حيوان مفحوص حيث توزعت النسبة على كلا الجنسين ٣.٥ و ٣.٩ للذكور والإناث على التوالي. عيانيا تباينت الآفات في الحجم من ٠.٥-٩ سم في القطر وكانت سوداء او رمادية او مشابهة للون الجلد المحيط الإفة. وكذا اختلفت في الشكل من مسطحة الى كروية او غير منتظمة الشكل. يظهر الثالوث في اي جزء من جسم الحيوان وخصوصا في منطقة الرأس ويليها الصدر والرقبة ومنطقة البطن ثم الاطراف الخلفية والضرع وينسب (٤٢.٩)، (٢٨.٥)، (٢٣.٨)، (١٩%)، (١٤.٩) و (١٤.٩) على التوالي. نسيجيا بينت الدراسة وكذلك بينت الدراسة ان هنالك فرق معنوي بين المجاميع العمرية حيث كانت اعلى نسبت إصابة في العجول الفتية (٧-١٢ شهر) وتليها المجموعة العمرية المجاميع (٢ اشهر -٢ سنة) ثم (١يوم-٦ اشهر و٣ سنوات) وينسب (٧.٨٤) و(٤.٢٥) و(١.٨) و(٣.٥) على التوالي. اما تأثير الحالة العامة لجسم الحيوان على نسبة الإصابة فبينت الدراسة ان الحيوانات النحيفة (score 2 of body condition) كانت شديدة الإصابة من حيث عداد وحجم الاورام الجلدية مقارنة المتوسطة والجيدة الحالة العامة للجسم (score 2 and 3 of body condition)