

## EFFECTS OF CORYNEBACTERIUM PSEUDOTUBERCULOSIS ON SHEEP KIDNEYS

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### SUMMARY

Light and electron microscopic examinations were performed on kidneys of sheep infected with caseous lymphadenitis ( CLA ) caused by Corynebacterium pseudotuberculosis. Membranoproliferative glomerulonephritis was demonstrated. There were irregular thickenings of the glomerular basement membrane and glomerular cell proliferation, in contrast, no such lesions were found in the control lambs, indicating that CLA play a role in inducing glomerulonephritis .

### INTRODUCTION

Caseous lymphadenitis of sheep is a chronic bacterial disease characterized by the formation of abscesses in lymph nodes and exerting little effect on health of the sheep unless the disease becomes generalized. Chronic bacterial diseases induce an immune response in the body such as immune complex disease. Immune complex glomerulonephritis was observed in association with pyometra in dogs (1), in sheep with Vibrio foetus infection (2), in hamsters with experimental leptospirosis (3) and in man with bacterial infection (4). This study is performed on a group of nine lambs naturally infected with caseous lymphadenitis caused by Corynebacterium pseudotuberculosis to clarify, the type of kidney damage (glomerulonephritis).

## MATERIALS AND METHODS

Nine adult lambs which severely infected with CLA together with other five healthy lambs as control were used in this study. These animals were raised the flock college of veterinary medicine Baghdad University in 1990 The lesions were characterized by abscesses formation in the lymph nodes of the shoulder, neck and the lower jaw, Those lesions were noticed after few months of shearing. The microorganism C pseudotuberculosis was isolated from all infected lambs. The control lambs were serologically checked for freedom of CLA and they are apparently free form any clinical disease . all lambs were sacrificed and kidney samples for electron microscopy were taken immediately after sacrifice. Other tissue samples were processed for microscopic examination as described before (5).

## RESULTS

In lambs with CLA, the glomerular changes seen under light microscope were : mesangial cells proliferation, increase in mesangial matrix, thickening of some parts of the glomerular basement membrane and lymphocytic cells infiltration (Fig.1) electron microscopy EM in all lambs infected with CLA, there were irregular thickening of the glomerular basement membranes, obliteration's of the endothelial fenestration's, fusion of the foot processes possibly due to deposition of immune complexes in the basement membrane ( Fig.2 ).

## DISCUSSION

In bacterial infection, immune complex glomerulonephritis has been found to follow pyometra in dogs (6), vibrio foetus infection in sheep (2), leptospirosis in hamsters (3) and streptococcal infection in ma (7). Bacterial toxin is known to incite a strong immune complexresponse and causes deposition of complexes in the glomeruli (8). In the present study, the persistence of infection probably initiated an immune reaction with

specific antibody response which later on probably led to immune complexes, formation which were deposited in the glomerular tufts inducing a secondary immunopathological process with kidney injury in particular a glomerulonephritis. Localization of soluble immune complexes in the glomerular basement membrane and then in the mesangial regions, glomerular cells proliferation and lamphocytic infiltration irregular thickening of the glomerular basement membrane. All these changes were similar to those found in glomerulonephritis associated with bacterial infections ( 2,3,4,6,7 ). Since there was no indication of any other mediator producing this lesions, it is strongly thought that CLA was the cause of this glomerulonephritis.

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Fig 1. Glomerulus of an infected lamb showing thickening of the glomerular basement membrane and white blood cell lymphocytes infiltration with proliferation. ( X 300 ).



Fig 2. Transmission electron micrograph illustrating fusion of the foot processes possibly due to deposition of immune complexes in the basement membrane uranyl acetate and lead citrate stain . ( X7000 ).

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## تأثيرات جرثومة السل الكاذب على كلى الأغنام

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### الخلاصة

اجري الفحص النسيجي لكلى الأغنام المصابة بمرض التهاب العقد الليمفاوية التجبني بواسطة المجهر الضوئي والإلكتروني . وبعد الفحص النسيجي تم تشخيص وجود التهاب الكلية والكبيبة الغشائي التكاثري مع نتخن غير منتظم في الغشاء القاعدي للكبيبة وتكاثر خلوي ملحوظ في خلايا الكبيبة وبالمقارنة مع حملان السيطرة لم نجد مثل هذه التغيرات والآفات المرضية مما يدل بان المرض يلعب دورا في أحداث هذه الآفات في الكبيبات الكلوية .