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تحليل البول كوسيلة لتشخيص الحالات تحت الكلينيكية لأمراض الجهاز البولي في الجاموس

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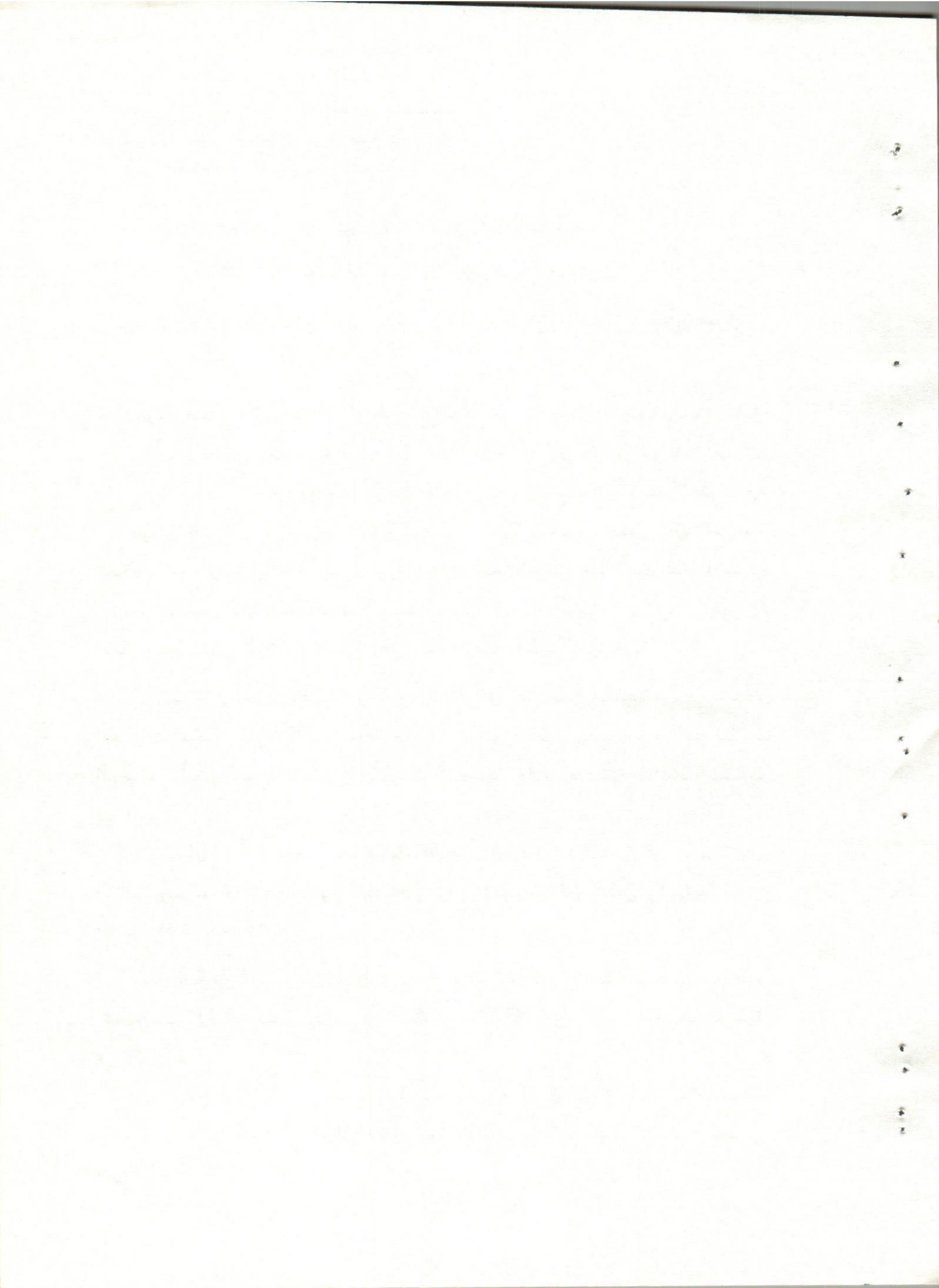
أجريت هذه الدراسة على أربعون جاموسه حديثة الولادة وتعاني من إصابات في الجهاز البولي بصوره غير مرئية اكلينيكية بالاضافة الى عشرة حيوانات أخرى سليمة استخدمت للمقارنه . وقد تم عزل الميكروب القولوني ، الميكروب المكور العنقودي الذهبي ، وميكروب الكورائيني بكتريم وميكروبات من جنس البروتيبس عند الفحص البكتريولوجي لعينات البول من هذه الحيوانات . وقد ثبت معمليا من اختبارات الحساسيه للمضادات الحيوية فاعلية كل من الريفاميسين ، الاستربتومايسين والكلورا مفينكول في القضاء على هذه الجراثيم .

كما ثبت من تحليل البول ايضا وجود الزلال بدرجات متفاوتة في جميع الحالات المصابه بينما كانت نسبة وجود الدم في البول في ٥٥ ٪ من الحالات المصابة . أيضا أوضح الفحص الميكروسكوبي وجود خلايا صديديه واسطوانات في البول .

ومن تحليل الدم وجد انخفاض ملحوظ عن المعدل الطبيعي في مستوى الكالسيوم ، بينما ارتفع مستوى الفوسفور الغير عضوي ، الكرياتينين والبولينا في الدم ارتفاعا ملحوظا .

بدأت مكونات الدم في التحسن وعادت الى حالتها الطبيعيه في حيوانات المصابه بعد أسبوع من العلاج ، كما زالت واختفت المكونات المرضية في البول .

ويستنتج من ذلك ، يجب اجراء فحص د وري للبول في الحيوانات لكشف وتشخيص حالات الجهاز البولي الغير مرئية اكلينيكية حتى يمكن علاجها في الوقت المبكر .



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**URINE ANALYSIS AS A DIAGNOSTIC MEAN FOR DETECTION OF
SUB-CLINICAL CASES OF URINARY TRACT INFECTIONS
IN BUFFALOES**
(With Two Tables)

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SUMMARY

A total of 50 buffaloes were included in this study, 10 of which were clinically healthy while the other showing atypical signs of urinary tract infection

E.coli, Staph.aureus, Corynebacterium spp. and Proteus were isolated from urine culture of affected cases. Sensitivity tests revealed that these isolates were sensitive to Rafampicin, Streptomycin and Chloramphenicol.

Chemical analysis of urine showed various degrees of albuminuria in all affected animals, while blood in urine was found in 55% of cases. Pus cells, renal cells and casts were detected on microscopical examination of urinary sediment.

Biochemical analysis of blood from affected cases revealed a marked increase in serum inorganic phosphorus, creatinine and urea nitrogen with a marked decrease in serum calcium.

An improvement towards the normal in previously mentioned blood parameters was observed in affected animals after one week from the end of treatment with Streptomycin, also urine abnormalities disappeared.

From this work, it is concluded that periodical examination of urine must be done for early detection of subclinical cases to enhance in treatment of such cases as early as possible.

INTRODUCTION

Urinary tract infections are one of the major problems among farm animals. Most of them are usually sub-clinical in nature and may be pass unobserved since the characteristic clinical manifestations are absent with subsequent recovery. In the past, diseases of the bladder and urethra seemed to occupy a great attention in farm animals than those of the kidneys, however, many workers studied pyelonephritis as a chronic purulent inflammation affecting kidneys, ureters and urinary bladder of various animals (JONES and LITTLE, 1962; WATSON, 1935; CAMPBELL, 1963; EL-SAID, 1968 and KELLY, 1974).

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MORSE (1950) reported that most of urinary tract infections in bovines are mainly ascending in nature and usually takes place through service by infected bulls, carelessness during catheterization or bad hygienic measures during or after parturition.

DOXEY (1971) found that the main causative agent of pyelonephritis was *Corynebacterium renale*, which is excreted in the urine of both diseased animals and carriers. Moreover, other organisms such as *Corynebacterium pseudotuberculosis*, *C.pyogenes*, *E.coli* and *Staphylococci* spp. were detected in the urine of affected cattle either alone or in association with *C.renale* (EL-SAID, 1968; BLOOD and HENDERSON, 1974).

Recently, studies has been directed to the etiology, pathogenesis and medical treatment of sub-clinical cases of urinary tract infections owing to the difficulty in their clinical diagnosis and need for carefull attention to be done than in acute ones. For this reason the present work is planned to detect the causative agents and its sensitivity to different antibiotics to select the appropriate ones for treatment of such conditions, as well as to study changes in some blood constituents before and after treatment of such cases.

MATERIALS and METHODS

Fourty female buffaloes (5 to 10 years old), having history of recent delivery were chosen for this purposes. Eight of these animals showed typical characteristic signs of urinary tract infection as febrile reaction, arching the back, straining during urination with abnormaliy in urine colouration; while the other animals revealed the following syndroms: fluctuating body temperature, capricious appetite, emaciation, decrease in milk yield as well as digestive troubles.Yet no change in urine could be detected by naked eye.

Urine samples were collected aseptically from tested animals in sterile containers. In addition, ten samples were also collected from apparently healthy female buffaloes. The collected urine samples were examined bacteriologically to detect the various microorganisms following the technique of EDWARDS and EWING, 1962). In vitro sensitivity tests were performed against five antimicrobial agents using the disc method of MARLEY (1945).

Chemical analysis and microscopical examination of urine samples were done according to COLES (1974).

Blood samples for biochemical analysis were collected from both normal and affected buffaloes for determination of serum calcium, inorganic phosphorus, magnesium, creatinine and urea nitrogen by using the methods of GINDLER and KING (1972); FISKE and SUBBAROW (1925); DENIS (1922); Husdan and RAPOPORT (1968) and MARSCH, *et al.*, (1965), respectively.

Streptomycin was injected intramuscularly in a dose rate of 10 mg/kg body weight for four days in treatment of affected cases. Urine and blood samples were taken again from tese animals after one week from treatment for further analysis.

RESULTS

Results of chemical and microscopical examinations of the urine as well as results of biochemical analysis of the blood were recorded in Tables (1 and 2).

DISCUSSION

Bacteriological examination of urine showed that 80% of normal cases were free from bacteria, while *E.coli* could be isolated from the other urine samples. These results may be

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attributed to the unhygienic conditions of the stables floor, added to that, contamination of urine takes place during migration of microorganisms from external urethral orifice to the urinary tract while the animals submerge under stagnant contaminated water. On the other hand *E. coli*, *Staph. aureus*, *Corynebacterium* spp. and *Proteus* spp. were isolated from urine samples of the affected buffaloes. These results were in agreement with those recorded by EL-SAID (1968); DOXEY, (1971); BLOOD and HENDERSON (1974). Sensitivity tests indicated that these isolates were mostly sensitive to Refampicin, Streptomycin and Chloramphenicol, while Penicillin and Tetracycline could not inhibit these organisms. Similar findings were given by FRANK *et al.*, (1950) who reported that Chloromycetine was one of the most effective antibiotics against *E. coli*, *Aerobacter Aerogenes*, *Proteus* and *Ps. Aerogenes*, while Vasenius *et al.*, (1964) found that 376 strains of *E. coli* were resistant to penicillin.

Table (1) summarises the results of some chemical analysis and microscopical examination of urine from both normal and diseased buffaloes. The data revealed various degrees of albuminuria and pyuria in all affected conditions. Haematouria was present in 55% of affected cases, while granular and leucocytic casts were observed in 65% of cases. According to CAMPBELL (1963), EL-SAID (1968); DOXEY (1971) and KELLY (1974) the presence of more than 10 pus cells/H.P.F in centrifuged urine sample as an indication of inflammation or necrosis in tissues of urogenital tract. MEDWAY *et al.*, (1969) mentioned that the varying quantities of protein in urine samples depend on the severity of the infection and tissue involved. Blood cells and casts may be arising from damage to the renal epithelium.

Biochemical analysis of blood, from affected buffaloes, revealed marked increase, than normal, in the levels of blood urea nitrogen, serum creatinine and inorganic phosphorus (Table 2). These changes were accompanied by marked decrease in serum calcium level, while serum magnesium level showed a slight increase. COLES (1974) found similar results in serum calcium, inorganic phosphorus, creatinine and urea nitrogen in chronic renal diseases. BREAZILE (1971) attributed the increase in magnesium level to renal insufficiency.

Clinically, an improvement was observed after treatment with Streptomycin, these represented in the absence of febrile symptoms and digestive troubles, improved appetite and increase of milk yield. Also the blood parameters under study started to reach their normal levels and abnormalities in urine disappeared.

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Table (1): Results of chemical and microscopical examinations of urine samples of both normal and diseased buffaloes before and after treatment.

Examination	Unaffected animals (Control) (n=10)	Affected animals	
		before treatment (n = 40)	after treatment (n = 40)
Albumin	+ve	(20) +ve (12) ++v (8) +++ve	Trace
Glucose	-ve	-ve	-ve
Blood	-ve (18) -ve	(18) -ve (22) +ve	-ve
Bile salts or Bile pigment	-ve	-ve	-ve
No. of pus cells/ (H.P.F.)	Less than 5 cells	(20) 10-15 cells (12) 16-20 cells (8) over 20 cells	not more than 5 cells
Renal cells	Absent	Present	Absent
Casts	-ve	(14) - ve (18) granular (8) leucocytic	-ve

Table (2): Mean values of some blood parameters of normal buffaloes and those with urinary tract infection before and after treatment

Blood parameter	Unaffected animals (control)	Affected animals	
		before treatment	after treatment
Serum calcium mg%	10.18±0.44	8.97±0.34*	9.45±0.28
Inorganic phosph. mg%	5.34±0.55	5.95±0.43*	5.44±0.22
Magnesium mg%	1.93±0.16	2.21±0.14	2.05±0.09
Serum creatinine mg%	2.30±0.32	3.38±0.28*	2.74±0.24
Urea nitrogen mg%	23.10±2.24	45.98±1.98**	34.76±2.86

* : P/___ 0.5

** : P/___ 0.01

