

The capability of camels urine in the treatment of infection caused by *Escherichia coli* and *Staphylococcus aureus*

R.Z. Shinashal

Department of Biology/College of Girls Education
University of Mosul

Abstract

The present study aimed to study the effect of camels urine as an antibiotics for the treatment of experimentally infected rabbits in two groups , the first one includes rabbits infection occurred after induction of *E. coli* orally with a dose of 1 ml / kg of body weight , diarrhea appeared after 15 hr. The Second group of rabbits infected cutaneously after induction of staphylococcus aureus in burned area on the thigh with a dose of 1ml / kg of body weight , the abscess appeared after 20 hr. The study showed that camels urine has a good activity in the treatment of diarrhea after 20 hr. of administration compared with the antibiotic (Gentamicin) which give the same results with in 24hr , in the same time, that camels urine showed a good activity in the treatment of the infected burned skin in 48hr, compared with the antibiotic (Dicloxacillin) which gaves the same results within 72hr, in the second group of infected rabbits .

قابلية بول الابل في علاج الاصابات المتسببة عن *Staphylococcus aureus, Escherichia coli*

ريم زهير شنشل
قسم علوم الحياة / كلية التربية للبنات
جامعة الموصل

الملخص

تهدف هذه الدراسة إلى فعالية تأثير بول الابل في استخدامه كمضاد حيوي لعلاج الارانب المصابة تجريبياً بمجموعتين فالمجموعة الاولى جرعت فمويًا بـ *E.coli* 1 / كغم من وزن الجسم , اذ ظهرت أعراض جهازية للإصابة متمثلة بالإسهال بعد 15 , في حين ضمت المجموعة الثانية التي تم اصابتها في الجلد *Staphylococcus aureus* . 1 / كغم من وزن الجسم فظهرت أعراض جلدية متمثلة بـ الخراج بعد 20 . بينت الدراسة الحالية ان استخدام بول الابل كمضاد حيوي وذو فعالية جيدة في علاج حالات الاسهال وخلال 20 ساعة من التجريح مقارنة مع استخدام المضاد الحيوي (Gentamicin) التي أعطت نفس النتائج وخلال 24 ساعة وب نفس الوقت أظهرت الدراسة فعاليته في علاج الاصابة الجلدية وخـ 48 ساعة مقارنة مع استخدام المضاد الحيوي (Dicloxacillin) والتي أعطت نفس النتائج وخلال فترة 72 ساعة كما في المجموعة الثانية من الاصابة .

keywords : Dicloxacillin, *Staphylococcus aureus*, *E.coli*.

Introduction

In recent years, the increase in microbial diseases, has grown into an ever bigger challenge for antimicrobial therapy. Proper natural drugs are identified as one of the essential elements of primary health care. From these drugs is camel urine in which has to be both therapeutically and antimicrobial factors. (Munir, 2011).

Studies showed that the use of camel urine as a medicine in the hadiths and how such usage is viewed in the Muslim world , it appears prophet Muhammad (peace and blessing

of Allah be upon him) believed camel urine had medicinal value and prescribed it to cure the men's illness (wikiIslam 2012)

(Read, 1925; Baesme12004) showed the urine constituents included calcium, magnesium, sodium inorganic phosphorous, total nitrogen ammonia, urea, uric acid, creatinine, creatine, hippuric acid, chlorides and the purine bases, also showed the urine had a dark, smoky, yellow color and smelt like sweet hay, it had a specific gravity from 1.045 to 1.056 and these researches stated that camel urine has efficiency as slow diuretic, having high levels of potassium and proteins , its effectiveness as fibrindytic factor, also demonstrated that this urine differ some what obviously in hydrated and dehydrated camels.

The drinking of camel urine is part of an alternative medicine movement called urine therapy. it contains Hippuric acid is a carboxylic acid found in the urine of horses and other herbivares, high concentration of this acid can indicate a toluene intoxication, (Salwa, 2006).

Another researches suggests the antibodies that camels carry inside them are structurally much simple then these of human and proved the small size of camel antibodies would also allow them to penetrate deep into human tissue and cells that would not be otherwise accessible also proved the camel antibodies by being transported from the desert sands into the laboratory test tube, had the potential to be a vital weapon against human diseases. (Abdulla, 2002)

The aim of study

This study to investigate the activity of camels urine that the best treatment due to its high efficiency to the bacterial cells, i.e (*E.coli* and *staphylococcus aurens*) .

Materials and methods

The study consist of two lines :

- A. The systemic infection .
- B. The cutaneons infection .

A. The systemic infection

This study consisted of :

- 1- In vivo experimental study
- 2- In vitro experimental study

1- In vivo experimental study

I. Bacterial strains

Strains of *E.coli* had been taken from college of science / department of biology / university of Mosul , and diagnosed using the biochemical tests, strains were subcultured in nutrient broth, incubated at 37°C under aerobic condition for 24hr , then stored at 4°C in refrigerator until used.(Finegold, and Martin 1988).

II. Collection of camels urine

As 24 sample of urine (2 male &1female) with ages ranging from 8 months to 3 years of one breed, were collected a aseptically from barn of AL-Azawi in Bab- ALshamis / Mosul .

All samples were transferred to the laboratory in sterile bijous bottles then samples were immediately subjected to microbiological processing .

III. Technique of the infection

(12) rabbits (private breed) were used in this line of study, their ages ranged between 6-10 months .

The induction of *E.coli* infection was orally at a dose equal 1ml/kg of body weight (concentration 10^7 cfu/ml), diarrhea appeared after 15 hr.

The 12 infected rabbits were divided into 3 group (4 rabbits / group)

- The first one (4 rabbits) were treated with urine as giving by syringe (3ml) twice daily morning and evening for 4 days
- The second group (4 rabbits) were treated with antibiotic (Gentamicin 500 mg) as the first one(positive control) .
- The third group (4 rabbits) were treated with saline as above (negative control).

2- In vitro experimental study (Antibacterial activity)

This study depended upon disc diffusion method on the surface of Mueller Hinton agar which were flooded with 0.1 ml of the inoculum of *E.Colias* the same dose of in vivo experimental study, then plates were desiccated 5-10 min, for adequate drying at room temperature, then disc impregnated with the test urine at a concentration 10^7 cfu/ml of it and dried at 37°C for 30 min, were placed on the surface of inoculated, antibiotic (Gentamicin) were used as positive control, while the disc impregnated with saline was used as a negative control and incubated at 37°C and the results were recorded after 24-48hr. by the appearance of inhibition zone was recorded as a positive results.(Joseph ,*et.al* 2008) .

B- The cutaneous infection

Also this study included :

- 1- In vivo experimental study
- 2- In vitro experimental study

1- In vivo experimental study

I. Bacterial strains

Strains of *Staphylococcus aureus* had been taken from Al-Zahrawii teaching hospital in Mosul, which were isolated from swabs collected from burned patients, strains were subcultured from a starter culture incubated at 37 under aerobic condition for 24 hr. in nutrient broth, and stored in refrigerator at 4°C until used(Finegold and Martin 1986) .

II. Technique of the infection

12 rabbits (private breed) were used in this study their ages as the systemic infection, the thigh of rabbit was shaved and clipped of for all the rabbits, these area were burned using heated scalple, burned area were infected with an inoculums of *Staphylococcus aureus* at adose equal 1ml/kg of body weight (concentration 10^7 cfu/ml), subcutaneously and these rabbits were left for one day to ensure to occurrence of infection (Figure 1).



Figure 1 : Site of wound showing the abscess

The 12 infected rabbits were divided into 3 groups (4 rabbits/ group)

- The first one (4 rabbits) were treated topically with the prepared piece of cotton mix with test urine as (1 ml/kg) of body weigh twice daily morning and evening for 4 days

- The second group (4 rabbits) were treated with antibiotic (Dicloxacillin 500 mg) as the first one as (positive control)
- The third group (4 rabbits) were treated topically with saline as a negative control group .

2- In vitro experimental study

Staphylococcus aureus was inoculated in nutrient broth, in cubateded for 24 hr, at 37°C, Mueller Hinton agar plates were seeded with 0.1 ml of liquid inoculums of Staphylococcus aureus as the same dose of in vivo experimental study, prepared from strains of Staphylococcus aureus, the first filter paper disc were impregnated with test urine at a concentration 10^7 cfu/ml as a dose equal 1ml/kg of body weight, antibiotic (Dicloxacillin) were used as positive control, while saline used as a negative control , results were recorded after incubation 24-48 hr. at 37°C(Joseph ,*et.al* 2008).

Results

The results of the present study aimed to assess the antibacterial effect of camels urine, as our study divided into two lines.

In the systemic infection, the results reported in the (Table 1) indicated that the first one treated with urine recovered after 15 hr, while the second group treated with gentamicin recovered after 24 hr, and the third group treated with saline recovered after 96h, after that taken feaceses of rabbits in the first one, culturing on brain heart infusion agar to confirmed that cases were healed by using urine, that showing no growth of *E.coli* on the plates .

In the cutaneous infection, the results of our study were showed the healing rate of skin infection, by that infection healed with urine, the results showed 48hr compared with the second group which was treated with Dicloxacillin which showed complete healing with in 72 hr, while the healing of the third group (control group) take 120 hr, then taken swabs from site of wound of rabbits in the first group, culturing on brain heart infusion agar to confirmed that infections were healed by using urine that showing no growth of microbe on plates .

Also the results reported in the (Table 1) indicate that wound treated with urine showed complete healing after 48hr (Figure2) .



Figure 2 : Healing of wound by urine

Otherwise wound treated with Dicloxacillin after 72hr (Figure 3)



Figure 3 : Healing of wound by antibiotic (Dicloxacillin)

Also wound treated with saline as a negative control group healed completely after 120 hr, (Figure 4)



Figure 4 : Healing of wound by saline (control group)

Significant difference in the rate of treatment of diarrhea were observed between diarrhea treated with saline, diarrhea treated with urine and antibiotic, urine gave the fastest rate of recovering compared with other groups, this was the results of in vivo experimental study, the same results were obtained from the in vitro experimental study, zone of inhibition against *E.coli* was seen the urine and this zone was larger than that for antibiotic but control disc (saline) showed no inhibitory effect by length(1.8cm)(1.2cm)(0 cm) respectively (Figure 5a) also difference in the rate of wound healing were observed between wound treated with saline and wound treated with either urine and antibiotic, urine gave the fastest rate of healing compared with other, this was the results of in vivo experimental study, the same results were obtained in vitro experimental study as a zone of inhibition against *Staphylococcus aureus* for the urine was higher than that inhibition in control disc (saline) and the diameter of inhibition zone was (1.5 cm) (1.2cm) (0 cm) respectively (Figure 5b)



Figure 5 : a. zone of inhibition of camel urine (A), gentamicin (B), saline (C) against *E.coli*

b. zone of inhibition of camel urine (A), Dicloxacillin (B), saline (C) against *Staphylococcus aureus*.

Table (1) : Difference between zones of inhibition in two genous of bacteria against test urine, antibiotic, and saline

Bacteria tested	Test urine (cm)	Time of recovery (hr)	Antibiotic (cm)	Time of recovery (hr)	Saline (cm)	Time of recovery (hr)
<i>E.coli</i>	1.8	20	*1.2	24	0	96
<i>S. aureus</i>	1.5	48	**1.2	72	0	120

* gentamicin

** Dicloxacillin

Discussion

The results of this study is testing the effect of the urine on growth of pathogenic bacteria i.e. *E. coli* and *Staphylococcus aureus*, this accordance with (Aishea 2006; Mura, *et.al* 2008; Munir, 2011). The urine is believed to have a lethal effect on the germs that cause many diseases. It can also be used as an antiseptic "treatment of burns" soft bloody injuries and can be used for cleaning wound and sores, camels urine is also efficacious in the treatment of swelling of the liver and other disease such as abscesses sores that appear on the body and toothache and for washing eyes. Camels urine is said to act as a slow-acting diuretic, but it dose not deplete potassium and other salts as other diuretics do because urine contains high level of potassium and proteins It is believed to be effective against some types of bacteria and viruses.(Muhammed, 1998; Alawedi, 2004)

Camels urine constituents of water and urea, the latter of which has some well-known commercial and other uses, urine also contain small quantities of thousands of compounds, hormones and metabolites, including corticosteroids, the Chinese treat wounds by sprinkling urine ostis believed to stimulate the circulation. (CSL, Tagelsir, 2010).

It could be concluded that camel urine proved to be antimicrobial activity natural and satisfactory for using as medicinal treatment in the field of medical therapy (Al-Awadi and Al-Jedabi, 2000; Al-Talhi and Al-Bashan, 2006)

Camels urine contains a number of healing factors such as antibiotics, salts and urea, also possesses an immune system that is highly equipped to combat fungus, bacteria, viruses, because of the Antibodies that it is Contains, the most beneficial urine is that of the Bedouin camels known as najeeb. <http://faculty.ksu.edu.sa/shoeib/pages/camelurin/Abst.E.aspx>

Finally, it is evident that much more studies on the camels urine should be carried out concerning its microbiological properties for different medicinal therapeutic applications against *Salmonella spp.E.coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Streptococci*, *Staphylococcus aureus*, these accordance with our study (Ohaj, 1998; Khalifa, 2005; Mura, *et.al* 2008; Munir, 2011).

Conclusions

Glory to Allah who grants therapy in his creatures. Glory to Allah who learns his prophet Mohammad (peace and blessing of Allah be upon him) That there is an activemedicine for bodies in camel,s urine Allah says adolressing his prophets "Nor dose he say of his desire" Al-Najam / (3-4).

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