

Republic of Iraq
Ministry of Higher Education
& Scientific Research
University of Al-Qadisiyah
College of Veterinary Medicine



Antibiotic Susceptibility Test on *Klebsiella Pneumonia* Isolated from camels infected with Pneumonia in Al-Qadisiyah province

A Graduation Project Submitted to the Department
Council of the Internal and Preventive Medicine-College
of Veterinary Medicine/ University of Al-Qadisiyah in a
partial fulfillment of the requirements for the Degree of
Bachelor of Science in Veterinary Medicine and Surgery.

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2018 A.D.

1439 A.H.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

فَنَعَلَى اللَّهِ الْمَلِكُ الْحَقُّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ
إِلَيْكَ وَحْيُهُ، وَقُلْ رَبِّ زِدْنِي عِلْمًا ﴿١١٤﴾

صَدَقَ اللَّهُ الْعَظِيمُ،

من سورة طه

Certificate of Supervisor

I certify that the project entitled (**Antibiotic Susceptibility Test on *Klebsiella Pneumonia* Isolated from camels infected with Pneumonia in Al-Qadisiyah province**) was prepared by **Jaafar Anwar Jaafar** under my supervision at the College of Veterinary Medicine / University of Al-Qadissiya.

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1 / 3 / 2018

Dedication

To

all people ...

who love me...

Abstract

The study has conducted to evaluate the efficacy of the common used antibiotics in veterinary clinics against the bacteria *Klebsiella pneumonia* causing pneumonia in camels in Al-Qadisiyah province. Eighteen types of antibiotics, the commonly used in veterinary clinics, were used to determine the susceptibility (sensitivity) of *Klebsiella pneumonia* isolated from cases of pneumonia in Iraqi camels in order to find the best choice of treatment. Twenty samples of swap were collected from slaughtered camels in the slaughter house in the city and cultured on blood agar to identify the bacteria. *Klebsiella pneumonia* was present in thirteen cases according to the identification of the VITEK 2 compact technique. Gentamicin was the most susceptible antibiotic against *Klebsiella pneumonia* with clear zone of inhibition on the Mueller-Hinton agar used in the test.

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Chapter One

1-1 Introduction

Camels have saved the needs of people for years and have provided them with food and hides. They secured the trade and communication through the wide arid and semiarid expanses (Wernery and Kaaden, 2002).

The growing interest in camels becomes obvious when 300 camel experts from 30 countries took part in the first International Camel Conference in Dubai, United Arab Emirates (UAE), in February 1992 (Allen *et al.* 1992). Further international meetings and conferences took place in 1996 in Eilat, Israel, in 1997 in Al-Ain, UAE, and in 1999 in South and North America and in Morocco. As a significant source of milk, meat and hides as well as transportation and labor, the camels should show a more important role than currently the case in a world where food and energy reserves are dwindling (El-Gayoum, 1986). This is especially true as the camel is, due to its physiological attributes, the most suitable domestic mammal for uses in climatic extremes (Yagil, 1985; Wilson, 1989; George, 1992; Wernery, 1992).

1-2 Aims of the study

Study has aimed to make a diagnosis of *Klebsiella pneumonia* in Iraqi camels slaughtered in Al-Qadisiyah province that suffer from Pneumonia. Identify the causative agent; make it easy to find the suitable drugs for treatment.

Chapter Two: Review of Literatures

Pneumonia in camels

Researches in camel pneumonia are still infancy, the literature being dominated by case reports and description of incompletely investigated eruptions. Several authors have reported high antibody titers against numerous respiratory tract viruses such as Adenovirus, Parainfluenza 3, Respiratory Syncytial Virus, etc. in camel sera, but the epidemiological significance of these findings is not clear (Olaleye, *et al.* 1989).

Pneumonia is the most important and usually encountered disease of the camel. Agab and Abbas (1999) have stated pneumonia as the ninth most communal disease problem with peak incidence in autumn.

Pneumonia has been detected in association with endotoxemia, colibacillosis, enterotoxemia, leukemia, chronic skin infections and vitamin E/selenium deficiencies. These facts must be reserved in mind when pneumonia is diagnosed in camelids (Wernery and Kaaden, 2002).

Diagnosis

Several diagnostic procedures are available for the respiratory system. General evaluation includes history, physical examination and processing signs or chief compilations and diagnostic evaluation of the respiratory tract (Smith, 2009).

According to Quinn *et al.* (2002); the first stage, which was called primary isolation, is to select the appropriate media, time, and temperature of incubation to ensure that the organism of interest has a good chance of being isolated. The second stage is the secondary isolation where the sub culturing of each colony type from the primary isolation onto non-inhibitory media is accomplished. Upon isolation of a pure culture, each organism is described in detail according to cellular and colonial morphologies, optimum growth characteristics, and Gram stain reactions (Ahmed, 2008).

The identification of the microbes present in the transtracheal washes is the best way to make the diagnosis. The VITEK 2 is an automated microbial identification system that provides highly accurate and reproducible results as shown in multiple independent studies. With its colorimetric reagent cards, and associated hardware and software advances, the VITEK 2 offers a state-of-the-art technology platform for phenotypic identification methods (David, 2009).

In infectious disease therapy, an antibiotic is chosen with regard to sensitivity of the pathogen and cost of the drug. After samples are collected for culture, treatment may be started immediately based on clinical experiences, without actual knowledge of pathogen sensitivity. However, such information is critical if there is a subsequent lack of therapeutic response. Paper disks impregnated with various antibiotics are used to determine in vitro sensitivity of bacteria. The disks are placed on the surface of culture plates (blood agar, Mueller-Hinton agar) that have been streaked with the suspected pathogen. Inhibition of bacterial growth around a disk after 8-24 hr. of incubation at 37° indicates sensitivity to the particular antibiotic impregnated in the plates (Harold, *et.al.* 2000).

Treatment

Broad-spectrum antibiotic therapy in association with anti-inflammatory drugs is recommended as well as proper general nursing and supportive treatment. Antibiotics of choice are: Trimethoprim/Sulfadiazine, Procaine penicillin G, Gentamycin and Oxytetracycline. Anti-inflammatory drugs include: Flunixin meglumine and Dexamethasone (Wernery, and Kaaden, 2002).

Antibiotic Susceptibility Test

Twenty-five of forty-one *K.pneumoniae* isolates were resistant to tetracycline (61% resistance), the antibiotic most usually used for livestock treatments in pastoralist regions in Kenya. Apart from tetracycline only a very narrow choice of antibiotics is available to

pastoralists in North Kenya, namely sulphamethoxazole-trimethoprim, amoxicillin and penicillin-streptomycin. The presented antibiotic sensitivity patterns for *K. pneumonia* isolates from camel calves indicate that pastoralist camel owners in North Kenya (and in the Greater Horn of Africa in general) may often not have access to suitable means for treatment of septicaemic infections in young camel calves (Younan, et.al. (2013).

Chapter Three...

Materials and methods

Animals: Twenty slaughtered camels having postmortem signs of pneumonia were sampled; swabs were transported to the laboratory.

Materials:

Bacteriological evaluation: Blood agar was the best choice for the cultivation of *K. pneumonia* (11). The identification of the suspected bacteria has done depending on the VITEK 2 Compact.

Antimicrobial susceptibility test

The antibiotic disks were subscribed from medical shops type Bioanalyse (Germany). Mueller Hinton agar (Hemidia- India) was set in the laboratory by dissolving 38 g in 1 liter distilled water and sterilized in the autoclave.

Petri dishes of Mueller Hinton agar, which is highly specific for this test, inoculated with a suspension from fresh pure colony of *K. pneumonia* to impregnate the antimicrobial discs, a group selected that have common uses in veterinary clinics in Iraq, incubated for 22 hr. at 37° and then results had been read. Zone of inhibition measured in mm showed the high susceptibility as well as other less sensitive antibiotics.

Chapter Four... Results & Discussion

Results

Antimicrobial susceptibility tests had done on the bacteria isolated from the camels diagnosed with pneumonia and showed the high susceptibility to gentamycin as well as other antibiotics which come below in activity with very small zone of inhibition. Fig (1) shows the Mueller Hinton agar used in the test as a sample and the disk of gentamycin with the largest zone.

Recent researches identify the *K.pneumonia* according to susceptibility test to their specific antibiotics; gentamycin was the most active antibiotic against *K.pneumonia* isolated from camels with pneumonia.

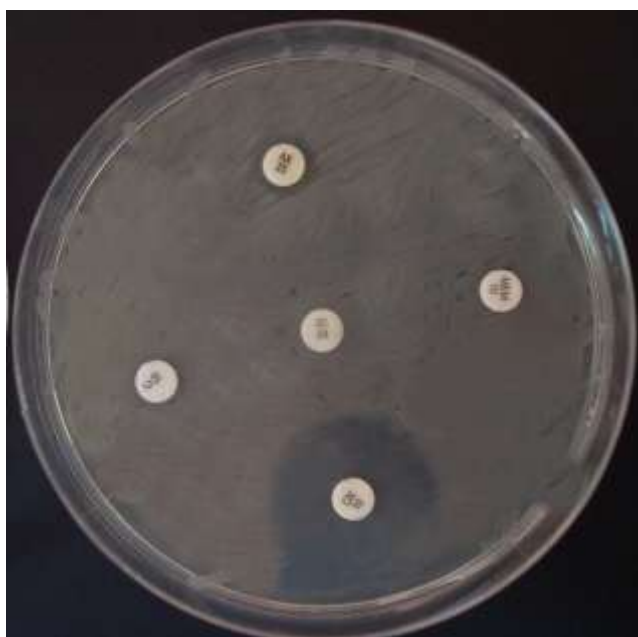


Fig (1): Susceptibility test on Mueller Hinton agar: (CN) Gentamicine discs.

Discussion

It was obvious that pneumonia is an important disease in camels especially when this study has demonstrated twenty cases in about fifty days, this was accomplished with (Hussain, 2014). Unlike previous studies; (Younan, *et.al.* (2013); gentamicin was the most effective on *K.pneumonia* because its resistance to a great number of antibiotics.

Conclusions

- 1- Pneumonia is an important disease in camels.
- 2- *K.pneumonia* became resistant to a great number of antibiotics.
- 3- Gentamicin was the most effective against *K.pneumonia*.

Recommendations

- 1- Pneumonia should be further studied in camels.
- 2- New generations of drugs should be used in the treatment to avoid the resistance of bacteria against antibiotic.
- 3- AST is a good test to find the first choice of drug in order to eliminate the loss of money through the wrong treatment.

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