

# Bacteriological Identification among Patients Attending at Jimma University Veterinary Clinic

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## Research Article

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## ABSTRACT

Findings of conducted have a look at confirmed that the most important bacteria in Jimma University Veterinary Medical Institution. Among main bacteria identified includes; *Escherichia coli* 46 (34.3%), *Klebsiella* 23 (17.2%), observed by way of *Staphylococcus aureus* 40 (29.9%) and *Streptococcus* spp. 25 (18.7%). Amongst four species of bacteria remoted, 2 had been gram bad and 2 of them turned into gram advantageous microorganism. A few of the antibiotic susceptibility check, *Staphylococcus aureus* confirmed the whole resistant on penicillin whilst tetracycline confirmed to have the very best sensitivity. *Escherichia coli* showed the overall resistant on gentamicin (100%). Veterinary sanatorium is at risk of obtaining bacterial infections due to the presence of referred to microorganism in the course of this have a look at. The large issue is that these infections withstand to antibiotics used in remedy consistent with results of the examine. Fitness care employees in veterinary health center have to improve hygiene to govern health facility obtained infections and lots interest should be done at some point of analysis to enhance treatment of patients.

**Keywords:** Microorganism; Veterinary; Infection; Antibiotic; Treatment

## INTRODUCTION

Veterinary clinics acquired infections are acknowledged to be not unusual cause of morbidity and mortality among animal patients. Antibiotic-resistant bacteria because the etiology of infection had been expanding at an alarming rate. These infections are due to Multi-Drug Resistant (MDR) bacteria and seriously lead to health care trouble and every day mission amongst veterinarians coping with diagnosis and remedy of sufferers.

Cross-contamination of pathogens amongst sufferers of inanimate surfaces round patients in veterinary clinics has been truly recognized in outbreaks; contamination can take vicinity both via microorganisms switch that infected health workers' palms or direct patient shedding of microorganisms whilst appearing their assignment related to patient care and remedy. Infections crossing from affected person to every other in addition to from veterinary medical institution people to sufferers constructed large dangers in fitness care especially in growing USA. Those infections are in most cases known to be reasons of morbidity and mortality of animals on the global. Contamination due to microorganism in clinics are associated without delay or not directly to using antibiotics in improper manner by way of wide variety of proprietors. Haphazard use of antibiotics and lack of expertise are the maximum imperative variables for the upward thrust, choice and spread of antibiotic-resistant organisms inside the surroundings. This unsuitable use of antibiotics creates opportunities of latest traces of microorganism appearance that face up to modern-day used antibiotics. Most of the antimicrobial dealers are utilized in feed of animal production for controlling illnesses and in the main used as boom promoter that is continuously disseminating in human food chain leads critical fitness problem in human and animals. Farm animals that come to veterinary clinics had been an ability source for the infection of the surroundings and farm products by means of antibiotic-resistant of *Staphylococcus aureus*, *Escherichia coli* and *Streptococcus* spp. found in cow milk, dung/cow urine. The manner of how Veterinary clinics environment is in terms of hygiene and different sports associated with patient care build the manner of spreading numerous antimicrobial-resistance pathogens. Both gram negative and gram high-quality bacteria withstand to antibiotics and maximum of them are *Staphylococci* wide type of *Enterobacteriaceae*, *Pseudomonas* species, *Acinetobacter* species or *Candida* species. Those pathogens are zoonotic in nature and can transmit to human from animals through infected milk, meat, water and direct contact with animals or their environmental system. *Salmonella* spp. is the most ubiquitous organisms in nature and foremost meals-borne zoonotic pathogen, it is also one of the pathogens listed inside the WHO precedence pathogen list.

Cattle manure contains microbial ingredients, which make it ability source of pathogenic microorganisms for animals and human. No matter all effort accomplished through veterinarian care placing to reduce the burden of infections in veterinary care unit, the fee of those infections continue to be a burden, however, sufferers in veterinary clinics are at excessive hazard of numerous infections because of their health state. But, these veterinary clinics patients are frequently vulnerable to infection due to impairing outcomes of their illnesses and cures on the immune system as well as some operative remedy results. Infection categorization is a totally big issue in diverse infection surveillance, manipulate and management, in particular in veterinary clinics as maximum of patient on this carrier are volatile to get 2nd infection. Fitness setting obtained contamination specially in Veterinary clinics based totally on time spent at health placing enough to distinguish bacterial contamination from network infections. Veterinarians have taken this inconsideration and confirmed that infection which can occur after pre-treatment clinic is not taken into consideration to be nosocomial or veterinary clinics received infection.

## MATERIALS AND METHODS

### Study design and sample collection

This look at was performed from January to July 2020 to December 2020 and 134 animal sufferers involves Jimma college veterinary clinics had been focused. A total of 134 samples had been accumulated from the health center in which each of the animals contributed 134 samples includes 36 cow dung (faecal), 35 milk, 19 pus, swab 30 and 14 urine. Inclusion standards had been all patients who identified clinically have bacterial contamination. The look at turned into achieved using go phase technique to acquire the unique samples from the patients in aseptic condition and transferred to laboratory on bacteriology carrier and the use of Ice box.

Specimen was collected from veterinary clinics and tested on microbiology and bacteriology unit of laboratory. All specimens were registered when collected.

### Bacterial identification technique

Different techniques were used for bacterial identification. Bacterial identification techniques used during the study including gram staining for gram positive and gram negative bacterial differentiation, catalase test to differentiate staphylococci and streptococcus, coagulase test to differentiate *Staphylococcus aureus* (positive) from coagulase negative staphylococci, Mac-Conkey agar was used to identify Enterobacteriaceae. However all samples were incubated in incubators to maintain the growth of bacteria.

### Antibiotic susceptibility tests

Antibiotic susceptibility test of bacteria was conducted regarding criteria of clinical and performed laboratory standard institute, using the Kirby-Bauer disc diffusion on Mueller Hinton agar. Isolates were grown in peptone water at 37 °C turbidity was matched with 0.5 McFarland standards. The placement of various types of antibiotic on culture was taken place on Mueller Hinton agar plate and incubated for 24 hr on 37 °C both the sensitivity and resistance were confirmed by means of measuring the diameter of inhibition zone.

## RESULTS

### Demographic characteristics of the participants

Tables 1-4 shows demographic characteristics of target population based on age, sex and body condition scores of patients in veterinary clinics.

**Table 1.** Demographic characteristics of the participant regarding to age group.

Age	Frequency	Percent
Adult	35	26.10%
Old	39	29.10%
Young	60	44.80%
Total	134	100%

**Table 2.** Demographic characteristics of the participant regarding to gender group.

Gender	Frequency	Percent
Female	72	53.70%
Male	62	46.30%
Total	134	100%

**Table 3.** Demographic characteristics of the participant regarding to body condition score group.

Body condition score	Frequency	Percent
Good	25	18.70%
Medium	52	38.80%
Poor	57	42.50%
Total	134	100%

**Table 4.** Sample type collected and diagnostic results in veterinary clinics.

Sample	Frequency	Percent
Feecal	36	26.90%
Milk	35	26.10%
Pus	19	14.20%
Swab	30	22.40%
Urine	14	10.40%
Total	134	100%

### Microorganisms identification

The Table 5 show the proportion of remoted microorganism in veterinary clinic. Remoted microorganisms are as follows: *Escherichia coli* 46 (34.3%), *Klebsiella* 23 (17.2%), accompanied by *S. aureus* 40(29.9%) and *Streptococcus* spp. 25 (18.7%). Among four species of microorganism isolated, 2 were gram horrific and more than one of them changed into gram terrific bacteria.

**Table 5.** Microorganisms identified from diagnostic results in veterinary clinics.

Organisms	Frequency	Percent
<i>E. coli</i>	46	34.30%
<i>Klebsiella</i>	23	17.20%
<i>S. aureus</i>	40	29.90%
<i>Streptococcus</i> spp.	25	18.70%
Total	134	100%

### Antibiotic susceptibility test of isolated bacteria

Frequently isolates of *Staphylococcus aureus* had been 40 (29.9%) as supplied on the Table 5 above. The antibiotics susceptibility check isolated on *Staphylococcus aureus*, is that it was totally resistant to Penicillin 36 (90%), it also confirmed the best sensitivity to gentamycin 40 (100%) and vancomycin 38 (92%) even as tetracycline 26 (65%) and slight sensitivity ciprofloxacin 24 (60%). In remedy of infection because of *Staphylococcus aureus*, the outcomes of the have a look at display that Penicillin isn't the perfect drug to treat *Staphylococcus aureus* related contamination at Jimma university veterinary clinics, but, resistant elements can be later studied in other researches.

Consistent with determine, Streptococcus is likewise amongst isolated bacteria and their frequency become 25 (18.7%). In this observe the antibiotic susceptibility take a look at for isolate on Streptococcus, confirmed the total resistance on Amoxicillin 25 (100%) and moderately withstand on ciprofloxacin 15 (60%) and Cefotaxime 13 (52%) while Imipenem confirmed sensitivity on 17 (68%). The identical examine became performed in Nigeria wherein outcomes showed the general resistance to ceftriaxone, cefuroxime, amoxicillin, ampicillin and ciprofloxacin and Augmentin which are the medication of choice to treat thyroid fever inside the location of have a look at even though, sensitivity was visible to Ofloxacin and Chloremphenicol, despite preventing these capsules in treatment of thyroid fever inside the location. The antibiotic susceptibility takes a look at on E. coli isolated whose frequency had been forty-six showed the whole resistance on gentamicin 17 (100%) reasonably face up to on Ceftazidime 20 (23%) and Chloremphenicol 9 (47%). The sensitivity became showed on Imipenem 16 (94.1%). The study carried out in Ethiopia in which the best isolation charge became obtained from urine samples 203 (45.5%). excessive resistance fee to Erythromycin (89.4%), amoxicillin (86.0%) and Tetracycline (72.6%) were visible. However, high sensitivity becomes seen on nitrofurantoin (96.4%), Norflaxacin (90.6%), Gentamicin (79.6%) in addition to Ciprofloxacin. Distinctive a couple of antimicrobial resistances of seventy 4.6% and the increase of resistance rates to all antimicrobials except ciprofloxacin have been saved. Antibiotic resistance became observed to be extra than sensitivity in all cases of test conducted throughout this observe. It is understandable; treating second contamination may be very difficult and boom resistance of bacteria to current antibiotics. The resistance extended basing on elements that choose the microorganism to infect the affected person. S. aureus is maximum resistant bacteria and is understood to be essential to purpose nosocomial infections mainly in skin and soft tissue because of its area in human body. In veterinary health center whilst treating a few infections, questioning on 2nd infections can be idea because of exposure of sufferers.

#### **Antibiotics susceptibility tests of Staphylococcus aureus**

Both sensitivity and resistant fee of staphylococcus aureus were shown the usage of various antibiotics. Penicillin, Gentamycin, Vancomycin, Tetracycline and Oxacillin are antibiotics used for antibiotics susceptibility take a look at of Staphylococcus aureus. The antibiotics susceptibility takes a look at isolated on Staphylococcus aureus, is confirmed that it turned into totally proof against Penicillin 36 (90%), it additionally confirmed the highest sensitivity to Gentamycin 40 (100%) and Vancomycin 38 (92%) even as Tetracycline 26 (65%) and slight sensitivity Oxacillin 24 (60%). The extent of sensitivity and resistance suggests the proper antibiotics to kill Staphylococcus aureus in treatment of infection as a result of Staphylococcus aureus. Gentamycin and vancomycin may be used as the first antibiotic for ailment treatment.

#### **Antibiotics susceptibility test of Streptococcus**

The antibiotics susceptibility test used for isolate Streptococcus spp. including Imipenem, Ciprofloxacin, Cefotaxime and Amoxicillin. It has been shown that Salmonella isolate totally resist to Amoxicillin 25 (100%) and moderately resist to Ciprofloxacin 15 (60%) and Cefotaxime 13 (52%) while Imipenem 17 (68%) showed sensitive. By strict analysis more other drugs are needed to treat infections related to Salmonella typhi level of resistance to be high. However, Imipenem can be used considering the result of this study.

#### **Antibiotics susceptibility test of Escherichia coli**

Gentamicin, Imipenem, Chloremphenicol and Ceftazidime are antibiotics susceptibility test isolated on of E. coli, where the rate of sensitivity and resistant were assessed. Gentamicin, Imipenem, Chloremphenicol and Ceftazidime used for antibiotics test of Escherichia coli. Escherichia coli isolated showed totality of resisting on gentamicin 44 (95.65%) moderate on Ceftazidime 24 (52.2%) and Chloremphenicol 22 (47.8%) and sensitivity high on Imipenem 45 (97.8%). The

very low percentage of the two microorganisms; *Klebsiella* and *Streptococcus* spp were also isolated, however, *Streptococcus* spp was seen in pus and *Klebsiella* was seen in cow dung and urine specimen. *Klebsiella* was seen to be resistant to gentamicin and tetracycline; and high sensitivity to penicillin. *Streptococcus* spp was resistant to Imipenem but sensitive to Cefotaxime.

## DISCUSSION

The examine turned into achieved for identifying common microorganism in affected animals that had been involves veterinary clinics at Jimma university. As shown at the Table 4, samples including urine 14 (10.4%), swab 30 (22.4%), pus 19 (14.2%), milk 35 (26.1%) and faecal 36 (26.9%) have been taken for distinctive techniques of bacterial identity. The outcomes of this take a look at, the overall of 134 sufferers were tested, 62 (46.3%) have been male and 72 (53.7%) have been female. lady occupied a first rate quantity of patients comparing to male. Some other have a look at carried out in India showed the high incidence of bacterial contamination in women (73.57%) comparing to males whose occurrence was (35.14%) and this observe is correlated with different studies that show the excessive incidence of infection in veterinary medical institution for females evaluating to adult males. The principle sample corrected in veterinary sanatorium changed into swab pattern, but the consequences confirmed that animals with swab samples are low risk compared to others thinking about percentages of fantastic consequences. Patients with pus and faecal samples in veterinary health center are at high hazard of infections in comparison to others. This because of kinds of illnesses that favors 2nd infections. Pus is primarily taken for animals with wound infections and these infections without problems infect the patient. Around 59% of all identified patient with pus sample have been infected which show high risk of infections among these group of sufferers. Patients with faecal pattern also showed high danger of infections and it typically recognized that Gastrointestine are suitable medium for microorganism boom. It turned into visible that 60% of patients recognized with faecal sample had been inflamed and this evidence displaying that feces harbors honestly microorganisms and develop. Fundamental microorganism in this take a look at have been diagnosed in veterinary sanatorium, both gram negative and gram nice had been proven with their chances. The complete occurrence of isolated gram negatives become 69 (51.49%) while occurrence for gram positives become 65 (48.50%). among gram positives remoted along with *Staphylococcus aureus* with 40 (29.9%) while isolated gram poor bacteria had been *Escherichia coli* 46 (34.3%), *Streptococcus* 25 (18.7%) and *Klebsiella pneumoniae* 23 (17.2%). The same observe was performed in Iraq by means of Nasser, et al., where sixty-eight of pure colony remoted were identified which includes 24 (35.29%) gram fine bacterial isolates and 44 (64.71%) of gram negative bacterial isolate. Every other take a look at performed in Iran via Hassanzadeh and Hadi the gram terrible 37 (4.6%) bacteria were notably extra concerned infections in comparison to gram fantastic bacteria 9 (10.9%). searching at variety of carried out studies in veterinary medical institution, gram negatives are more generic than gram positives, researchers and difference scientists have to marvel on causes. A part from deep analysis and identification of foremost microorganism, *Escherichia coli*, turned into located to be maximum general in comparison to others. This bacterium lives in environment and in lower intestines of warm blooded animals. Sincerely this bacterium leaves flow from the host's fecal flora to the urogenital tract and cause UTI. That is a justification of the excessive presence of *E. coli* in faecal and urine samples according to the consequences of this research. It is able to be a reason of different infections however in the main acknowledged to reason UTI. The second bacterium dominated is *Staphylococcus aureus*. These bacteria are recognised to be amongst animal's/human microbiota and broadly speaking reside on skin and upper respiration tract. The consequences of this observe suggests that *Staphylococcus aureus* was primarily located in pus samples and swab samples. The motive of fantastic check in those samples should be understood, *Staphylococcus aureus* as microbiota, is understood to be opportunistic pathogen in case of immune suppression. As a result extreme of comply with up must be carried out at some point of sufferers staying in veterinary clinics with the danger of being infected with *Staphylococcus*

aureus. *Staphylococcus aureus* is known to cause nosocomial contamination and the motive changed into explained above. Looking after sufferers with a good deal hygiene and keeping off simple contacts of them will reduce the unfold of those sort of infection in veterinary health facility.

### LIMITATIONS

- The study was conducted at Jimma college veterinary clinics to pick out common bacteria in veterinary clinics; but, a bit sample has taken because of hassle of price range to paintings with all veterinary clinics in and around Jimma place.
- The second drawback is that simplest Jimma college veterinary clinics has medical microbiology laboratory with strategies of bacterial identification like bacterial culture and others in and around Jimma vicinity veterinary clinics.

### CONCLUSION

The patients involves veterinary clinics are extra susceptible to bacterial infections. they're frequently resistant to diverse used antibiotics; the primary infecting microorganism in veterinary clinics have been *Staphylococcus aureus* and *Streptococcus* which are gram superb bacteria, *Klebsiella* and *Escherichia coli* that is gram negative microorganism and confirmed an excessive resistance to wide variety of antibiotics used at some stage in this take a look at. The high boom in resistance of microbes to previous and latest antibiotics is a component for fitness centers to govern the unfold of infections in phrases of improving remedies gadget as well as offering hygiene to fitness settings environments and infrastructures.

Based totally at the above end the following hints are forwarded:

- The ministry of livestock and fisheries in collaboration with researchers have to plan researches associated with antibiotic susceptibility to realize if used antibiotics are powerful to treat infections in veterinary clinics.
- Animal fitness schooling need to be furnished to the public in phrases of the use of given antibiotics for remedy in a correct way.
- Farms and veterinary clinics must enhance hygiene and use effective disinfectants and antibiotics.

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