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Microbes And Their Sensitivity To Antibiotics In Samples From The Joints Of Horses With Purulous Inflammation Processes

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Abstract. When examining the pH environment of the samples taken from the joints of horses undergoing purulent inflammatory processes in horse breeding farms and public feed, the pH environment in the acute process of the disease is from 6.6 to 6.9. , Escherichia coli 40%, Pseudomonas aeruginosa 50%, Proteus 30%, Enterococcus 40%, and the zones formed according to the sensitivity of microbes to antibiotics were 23-28 mm on discs soaked with 10% enrofloxacin, soaked with penstrep-400 20-25 mm in discs, 22-26 mm in ceftrakson-treated discs, 12-28 mm in kanamycin-treated discs, and 5-9 mm in ditrim-treated discs.

Keywords. Equine joints, suppurative synovitis, capsular phlegmon, suppurative arthritis bacteria, microbial species, staphylococcus, streptococcus, Escherichia coli, proteus, enterococcus and bacilli.

Relevance of the topic. Chronic periarticular fibrositis in the joints of horses is characterized by joint deformity, growth of the fibrous capsule, thickening of the joint ligaments, decreased flexibility, acute pain when the animal moves, and one-sided damage to the heel, wrist, and hip joints. Purulent inflammatory processes of the joint are found as a result of injuries, and are characterized by acute pain, swelling, redness, elevated local temperature and dysfunction, hyperemia of arteries, and increased permeability. Pathogenic bacteria enter, develop, and reproduce in open wounds in the joints, lyse the damaged soft tissue cells, induce the buildup of purulent-serous exudate, excite nerve receptors on the surrounding blood vessel walls, and generate swellings as a result of cell swelling. [1,2,3].

Purulent synovitis, capsular phlegmon, and purulent arthritis develop as a result of the impact of strong mechanical factors on the joints, open wounds of various shapes and depths, and the falling of aerobic and anaerobic pathogenic microorganisms, streptococci, staphylococcus, bacteria, bacilli, Escherichia coli, and so on. [4].

Joint disease is a difficult condition for horses, and in severe cases, it can result in permanent lameness, functional incapacity, or death from septic shock [5]. Septic arthritis is a joint inflammatory disease caused by bacteria, fungi, and viruses [13]. It is possible to damage all joint structures, which might result in clinical symptoms depending on the location of the lesion [10]. Bacteria are frequently the cause of septic arthritis. Pathogens enter the joint via blood, local invasion (traumatic inoculation), or iatrogenic pathway as a result of local contamination following direct drug penetration into the joint. [9].

Septic arthritis in horses is characterized by lameness of varied severity, edema, local heat, effusion, and significant pain on palpation [12].

The diagnosis is made in the first phase based on clinical indicators, a comprehensive clinical examination of the affected joints and extremities, and the identification of probable risk factors in the anamnesis (recent trauma, intra-articular injections, systemic disorders,

immunosuppression) [10]. Arthrocentesis is used to confirm the diagnosis, which is then followed by synovial fluid laboratory investigation, microbial culture, in vitro sensitivity tests, and imaging studies of the afflicted joint. [13,9]. Synovial fluid in septic arthritis may be hazy, purulent, or hemorrhagic, with changed viscosity. The fluid has a greater number of inflammatory cells and a higher concentration of protein [8].

Early infection detection is critical since many animals suffer persistent and severe lesions, and the animal may be unable to support its weight on the affected leg. As a result, the animal will gradually lose joint function, become prone to bedsores, and have a dismal prognosis. [10].

Antimicrobials and articular drainage are used in treatment to eliminate the pathogen and remove cellular debris and fibrin from the joint, which can damage articular cartilage [8].

Microbial culture in conjunction with in vitro susceptibility testing improves therapeutic efficacy [13]. Antimicrobials such as -lactams, aminoglycosides, sulfonamides, fluoroquinolones, macrolides, rapamycin, and amphenicols are used to treat septic arthritis as monotherapy or in conjunction with intra-articular or parenteral injections [5,8]. Antimicrobials with broad spectrum activity and high intra-articular concentrations should be selected. [8].

Multidrug resistance in bacterial species is an emerging global concern [11] that offers a severe threat to control and treatment options for many infectious illnesses affecting domestic animals [7].

However, the prevalence of medication resistance or the level of multidrug resistance in bacteria isolated from equine septic arthritis is unknown or overlooked to date.

Despite the severity of clinical cases of septic arthritis, there have been no systematic studies of the disease's etiological complexity, as well as the emergence of multidrug resistance to the most often used antimicrobials in treatment. There have been no systematic studies of the primary pathogens that cause septic arthritis in a large number of horses in Brazil, nor have there been studies of multidrug resistance of isolates. As a result, the current study sought to investigate the microbiological etiology of septic arthritis in 60 horses, as well as the emergence of multidrug resistance in isolates to the main antimicrobials used to treat the condition in this species. [6].

Research purpose. Taking the foregoing into consideration, it is necessary to determine the types, percentages, and sensitivity of microbes to antibiotics and other drugs, as well as biochemical and plasmacoagulase properties in samples taken from the joints of the factors that cause purulent joint diseases in horses in horse farms and under population care.

Research object and methods. Scientific research on determining the types, percentages, and susceptibility of bacteria to antibiotics and other medications, as well as biochemical and plasmacoagulase features of samples collected from equine joints using in vitro methods, in purulent joint disorders in horses. Residents of the Samarkand region's districts of Okdarya, Pastdargom, Tayloq, Urgut, Nurabad, Payariq, and Samarkand. It was carried out in the laboratory of the Samarkand Institute of Veterinary Medicine's Department of "Epizootology, Microbiology, and Virology."

All horses in the experimental districts under the care of the people were inspected for surgical disorders. General and laboratory examinations were carried out in this regard. The environment of samples collected from the joints of horses with purulent synovitis, capsular phlegmon, and purulent arthritis was determined using a pH meter (105 Ph-meter ORION StarA211 X26087).

The general condition of the animals was investigated, as was the size of the swellings in the joints by visual method, the forms of lameness to the size of the wound, the degree and limit of local temperature pain by manual palpation, and the flow of pus.

Samples were obtained from the joints of horses suffering from purulent synovitis, capsular phlegmon, and purulent arthritis for the laboratory tests. The samples were examined using microbiological, or generally accepted bacteriological procedures.

Samples from the joints of horses afflicted with purulent synovitis, capsular phlegmon, and purulent arthritis were cultured in different nutrient media in this case. From the microflora colonies that grew in the nutrient medium, a pure culture was separated. Nutrient medium that had been grown were placed in a thermostat (Heratherm 1MI 41839123).

Analysis of the obtained results: The in-vitro approach was used to study the biochemical and plasmacoagulase properties of samples collected from the joints of 10 horses with purulent synovitis, capsular phlegmon, and purulent arthritis.

The environment of samples collected from the joints of horses with purulent synovitis, capsular phlegmon, and purulent arthritis was determined using a pH meter (105 Ph-meter ORION StarA211 X26087). The pH of samples collected from the joints of 10 horses with purulent synovitis, capsular phlegmon, and purulent arthritis ranged from 6.6 to 6.9 during the acute course of the disease (Table 1).

Using special sterile swabs, samples were taken from the joints of horses suffering from purulent synovitis, capsular phlegmon, and purulent arthritis and planted in sterilized Petri dishes containing Streptococcus nutrient medium Velli agar, Staphylococcus nutrient medium, Shayli agar, and Pseudomonas aeruginosa nutrient medium Difko agar. After 24 hours at 37 degrees Celsius, the streptococcal colony was red in color, indicating acid formation by mannitol degradation, the pathogenic staphylococcus was yellow, similar to the color of lemon peel, and the colony of blue pus bacillus was cream in color, proteus white yellow, and enterococci appeared cloudy.

Samples were obtained from the joints of 10 horses suffering from purulent synovitis, capsular phlegmon, and purulent arthritis, and colonies of bacteria cultured in Petri plates were evaluated for colonies of 60% staphylococcus, 50% streptococcus, 40% Escherichia coli, 50% blue pus bacillus, and proteus. It was discovered that 30% and 40% of the bacteria were enterococcus (Table 2).

To test the sensitivity of microbes to antibiotics and other medications, a pure culture was isolated from a colony of microbes cultivated in Petri plates. One colony was removed from each Petri dish, diluted 1:10 in 0.9% physiological solution, and antibiotic-soaked discs were placed in a thermostat. When Petri dishes were removed from the thermostat, zones were noted to form around the disks. When the formed zones were measured using a ruler, staphylococcus was 28 mm, streptococcus 24 mm, Escherichia coli 26 mm, blue pus bacillus 23 mm, proteus 25 mm, enterococcus 27 mm in discs soaked with 10% enrofloxacin, and penstrep-Staphylococcus 24 mm, streptococcus 20 mm, Escherichia coli 22 mm, blue pus bacillus 21 mm, proteus 23 mm, enterococcus 25 mm in 400 smeared discs. Similarly, on ceftrakson-soaked disks, staphylococcus 26 mm, streptococcus 22 mm, Escherichia coli 23 mm, blue pus bacillus 23 mm, proteus 24 mm, enterococcus 22 mm, on kanamycin-soaked disks staphylococcus 22 mm, streptococcus 28 mm , Escherichia coli 15 mm, blue pus bacillus 13 mm, proteus 12 mm, enterococcus 21 mm. In ditrim smeared discs, relatively smaller zones were observed, in which staphylococcus 9 mm, streptococcus 6 mm, Escherichia coli 7 mm, blue pus bacillus 5 mm, proteus 6 mm, enterococcus 8 mm were noted (Table 3).

pH index of samples taken from joints of horses with purulent inflammatory processes.

Table 1

	Number of animals	**pH in a sick animal**	**pH environment of synovial fluid in healthy animals**
	№1	6,9	7,2-7,3
	№2	6,8	7,2-7,3
	№3	6,9	7,2-7,3
	№4	6,6	7,2-7,3
	№5	6,7	7,2-7,3
	№6	6,8	7,2-7,3
	№7	6,7	7,2-7,3
	№8	6,8	7,2-7,3
	№9	6,6	7,2-7,3
0	№10	6,9	7,2-7,3

Table 2 Types and percentage of microorganisms in joint samples of horses with purulent inflammatory processes.

№	Types of microorganisms	Number of cultures isolated	Percentage of isolated cultures
1	Stafilokokk	6	60
2	Streptokokk	5	50
3	Esrichikoli	4	40
4	Cook pus bacillus	5	50
5	Proteus	3	30
6	Enterococcus	4	40

	Total number of cultures isolated	27	-

Table 3 Susceptibility of microorganisms to antibiotics in samples taken from joints of horses with purulent inflammatory processes

№	**Enrofloxacin 10%**	**Penstrep-400**	**Ceftrakson**	**Kanamycin**	**Ditrim**
The diameter of the microbial growth area is measured with a ruler and expressed in mm.	**mm**	**mm**	**mm**	**mm**	**mm**
Staphylococcus	28	24	26	22	9
Streptococcus	24	20	22	28	6
Esrichikoli	26	22	23	15	7
Blue pus bacillus	23	21	23	13	5
Proteus	25	23	24	12	6
Enterococcus	27	25	22	21	8

It is of considerable scientific and practical value to study the etiopathogenesis of purulent inflammatory processes in horse joints in cost-effective approaches.

The scientific research done fully show the chain of development of purulent-inflammatory processes in horse joints and aid in the establishment of an economically justified treatment and prevention scheme utilizing novel medications in the treatment of purulent-necrotic processes.

Conclusion

1. When the pH environment in samples collected from the joints of horses undergoing purulent inflammatory processes in horse breeding farms and public housing was examined, it was discovered that the pH environment in the acute process of the disease is between 6.6 and 6.9

2. Staphylococcus 60%, streptococcus 50%, Escherichia coli 40%, blue pus bacillus 50%, and proteus 30% were found in samples taken from the joints of horses undergoing purulent inflammatory processes in the horse breeding farm and the population's feed. It was discovered that enterococcus accounts for 40% of the total.

3. In the zones formed, the zones formed according to the sensitivity of microbes to antibiotics were 23-28 mm in 10% enrofloxacin-soaked discs, 20-25 mm in penstrep-400-soaked discs, 22-26 mm in ceftraxone-soaked discs, 12-28 mm in kanamycin-soaked discs, and 5-9 mm was noted in ditrim soaked disks.

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