# OF PSEUDOMONAS AERUGINOSA IN INFECTIOUS PATHOLOGY OF HUMANS, ANIMALS AND BIRDS

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## RELEVANCE

Pseudomonas has increased significantly in the infectious pathology of humans, animals and birds. aeruginosa as the causative agent of various diseases, including septic and purulent-inflammatory complications in burns, injuries and surgical interventions, as well as the causative agent of nosocomial infections ( A.S. Gross et al , 2015; K. _ V. _ Morihara et al 2017; V. A. Zudilin, 2017; M. _ Pollack , A. _ K. _ Precurt , 2019; G. P. Kalina, 2015; R. I. Gvozdyak , L. M. Yakovleva, 1987;).

B. F. Bessarabov (2010); G.K. Otryganiev et al. (2014) described pseudomonous sepsis in chickens in the last days of embryonic development. This microorganism currently causes an independent disease called pseudomonosis (A. N. Borisenkova et al., ( 2016). In this regard, there is a tendency to increase the proportion of Pseudomonas aeruginosa against the background of other known pathogens that occur in chicken embryos and chickens first days of life.

In connection with the foregoing, it seemed relevant to consider the issue in more detail in medicine and veterinary medicine and, as factual material accumulated, to conclude the pathogen in the infectious pathology of humans, animals and birds.

## MATERIALS AND METHODS

The occurrence of pseudomonosis in humans, animals and birds was studied on the basis of laboratory data. SamMI and UzNIIV for the last 10 years. The regional feature of the epidemiology and epizootology of the disease was carried out in a number of medical clinics, farms and poultry farms of the Republic of Uzbekistan.

Pseudomonas aeruginosa culture was isolated from inpatients, hatching egg shells, suffocating embryos, parenchymal organs of chickens and adult birds. At the same time, morphological, tinctorial, cultural and biochemical properties were studied. Pathogenicity and antibiotic susceptibility have also been studied .

The smears were stained according to Gram, the preparations were microscoped using an ML-3 microscope. The mobility of Pseudomonas aeruginosa cultures was determined by the crushed drop method.

To determine the biochemical properties of the isolated cultures, they were inoculated into test tubes with Hiss medium , two for each culture, sterile vaseline oil was layered on the surface of the medium in a column of 0.5 cm in one test tube to create anaerobic conditions. Test tubes with crops were cultivated at a temperature of +37 $^0$ C. Saccharolytic properties were studied by inoculating cultures for differential diagnostic among with different carbohydrates (glucose, lactose, mannitol, sucrose, rhamnose , xylose, adonite , arabinose, maltose, inulin, sorbitol, dulcitol , dextrin ). Indole and hydrogen sulfide were determined according to the generally accepted method using indicator papers. Also put reactions with methylroth , chloroform and catalysis .

The pathogenicity of Pseudomonas aeruginosa was determined on laboratory models, bioassay on white mice, chicken embryos and chickens.

Antibiotic sensitivity Pseudomonas aeruginosa was examined by diffusion into agar using discs.

## RESEARCH RESULTS

The frequency of appearance and course of pseudomonosis was noted everywhere. In the Republic of Uzbekistan for the last 10 years, the disease has been observed annually in many clinics, hospitals, farms and poultry farms. Observations show that unsanitary conditions contribute to the emergence and spread of the disease, and in poultry farms, dense planting of chickens, microclimate disturbance in workshops, dampness, high humidity, lack of daily sorting and culling of weak, non-viable and sick birds. In this regard, the disease most often occurs in those farms where there are violations of sanitary and hygienic rules for growing and keeping chickens. In such farms, subject to the preservation of pathogenic strains of the causative agent of pseudomonosis , the disease can become stationary and it can appear from year to year.

Often pseudomonosis occurs as a secondary infection complicating the underlying disease. In some clinics, hospitals, poultry farms in our Republic, pseudomonosis occurs in association with staphylococcosis , colisepticemia , salmonellosis, pullorosis - typhoid infectious laryngotracheitis. As a rule, the causative agent of pseudomonosis causes the death of embryos at hatching and in the first days of the postembryonic period of life.

According to our long-term data and observations, the main sources of infection are the lack of proper hygiene in hospitals, and in poultry farming, the use of feed additives of animal origin, feed contaminated with Pseudomonas aeruginosa, sick birds, infected droppings, infected eggs, hatchery waste, etc.

When studying the biological properties of the causative agent of pseudomonosis , it was established: according to morphological and tinctorial properties, a short, straight or curved rod, located singly, mobile, does not form spores and capsules. The microbe is stained with conventional aniline dyes, Gram-negative .

Pseudomonas aeruginosa grows well on solid nutrient media, as well as on MPB, MPA, Endo medium . Most strains form cytochrome oxidase , catalase, break down gluconate, urea,

assimilate citrates and do not form acetylcarbinol . Many cultures are indole-negative , coagulate milk, thin gelatin.

Pseudomonas aeruginasa is capable of destroying erythrocytes, forming B-hemolysis, splits urea, with the formation of a funnel first, and then separation of the medium. When cultivated on Hiss media , most cultures of Pseudomonas aeruginasa ferment glucose, arabinose, mannitol, galactose, and xylose under aerobic conditions to form acid and gas. It does not ferment sucrose and lactose.

Pathogenic properties of isolated cultures of Pseudomonas aeruginasa was studied by infecting white mice, chick embryos, and chickens 10–15 days old. When white meshes were infected, they died on days 2–3, chicken embryos after 48 hours with signs of maceration of the embryo and its hyperemia, while the yolk turned green-yellow. Infected chickens on the second day were in a depressed state, with ruffled feathers, refused to feed. The death of birds was noted on the second day.

The degree of sensitivity of cultures of the causative agent of Pseudomonosis to antibiotics was assessed by the size of the diameter of the growth inhibition zone. In our experiments, sensitivity to neomycin , olemorphocycline , streptomycin and polymyxin was established .

According to G.K. Paliy et al . ( 2003), the drug spermosan (a mixture of penicillin and streptomycin, 35 thousand units of white streptocide - 0.2 g) , widely used in animal husbandry practice , had a detrimental effect on Pseudomonas aeruginosa only at a concentration 2.5 mg/ml and above.

## DISCUSSION

In recent years, the role of opportunistic pathogens has increased in the pathology of humans, animals and birds ( D. W. Sainsbury , 2017) . Pseudomonosis is registered in many countries of the world and the CIS ( Y. Estimov et al , 2018; A.V. Selivanov and with otr . (2019); S.T. Dzyubak , (2016). In this current situation, great importance is attached to the development of a diagnosis of the disease.

Our studies carried out over several years allow us to propose a rational scheme for the isolation of Pseudomonas aeruginosa. Conducted epidemiological and epizootological surveys and a set of laboratory studies have shown the wide distribution of pseudomonosis and its significance in the infectious pathology of humans, animals and birds.

## CONCLUSIONS

1. The epidemiological and epizootological situation of human, animal and bird pseudomonosis has been studied.
2. Pseudomonosis should be considered as an independent nosological unit with the organization of sanitary - hygienic, veterinary -preventive and therapeutic measures.
3. The results of the isolation of the causative agent of pseudomonosis and the study of its biological properties allow us to conclude that these properties are similar cultures isolated from sick people and birds and described by various researchers.
4. The diagnosis of pseudomonas can be considered established in the case of isolation from the pathological material of cultures with typical cultural and morphological properties and characteristic features characteristic of this species.

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