

Properties of Stamms of Golden Staphylococcus Aureus Taken From People in Rural Areas in Winter Conditions

A. M. Vahidova¹, G. N. Khudoyarova², Z. T. Muratova³, I. Sh. Barotov⁴

Abstract: Staphylococci of today are detected everywhere and in any organism. They were found in the contents of echinococcal bladders, which in addition to the total number of cases studied, staphylococci in samples represented a monoculture, associations with other microbes. Colonies of microbes grown on meat-peptone agar (MPA) were convex, round, with smooth edges and a moist surface. Depending on the pigment produced, the colonies were golden, enamel-white or lemon-yellow in color, ranging in size from 1 to 4 mm in diameter. On meat-peptone broth (MPB), staphylococci were characterized by turbid growth, precipitation, or (less often) film formation.

Keywords: winter conditions, Staphylococcus aureus, meat-peptone broth, meat-peptone agar, plasma coagulation, strains.

Objective of the study. To detect Staphylococcus aureus strains in the contents of a rural population under winter smear conditions by microbiological examination.

Materials and methods of the study. The study will determine plasma coagulation capacity of one of the most reliable methods to determine pathogenicity of Staphylococcus aureus. Of the strains of Staphylococcus aureus, plasmocoagulation reaction of strains did not show plasmocoagulation ability. The determination of staphylococcal haemolytic activity is known to be one of the reliable indicators of pathogenic staphylococci.

Results of the study. We identified 378 strains in the above 67 samples containing Staphylococcus aureus flora, distributed according to the nature of the pigment as follows: gold pigmented with 200 strains (52.9%), white pigmented with 116 strains (30.7%) and citric-yellow pigmented with 62 strains (16.4%). Staphylococcus strains were characterized by the following indexes according to the period of coagulation of rabbit plasma: 18 strains (9 %) coagulated plasma after 1 h, 66 strains (33 %) after 2 h, 42 strains (21 %) after 3 h, 21 strains (10.5 %) after 4 h. From 200 strains isolated 188 strains of Staphylococcus aureus (94 %) manifested haemolytic activity and 12 strains (6 %) showed no haemolytic activity. Haemolytic activity of the strains investigated by us was characterised by the following indexes: a weak degree of haemolysis - 79 strains (39,5%), an average degree of haemolysis - 61 strains (30,5%), a strong degree - 48 strains (24 %).

Thus, in half of the cases the isolated strains of Staphylococcus aureus showed very pronounced hemolytic activity.

As we have pointed out, the plasma coagulation reaction and hemolytic activity of staphylococci is one of the basic tests of pathogenicity. It is of interest to know how many of our isolated Staphylococcus aureus strains exhibited both of these properties simultaneously. Among 200 isolated strains of Staphylococcus aureus 142 strains (71%) simultaneously coagulated plasma and exhibited hemolytic ability, 46 strains (23%) showed only hemolytic activity without simultaneous plasmocoagulation and 5 samples caused plasmocoagulation without hemolysis.

Thus, out of 200 samples of Staphylococcus aureus, 142 strains (71%) exhibited sharply expressed pathogenic properties. In addition, we examined all strains for their ability to ferment mannitol, as this test is also one of the indicators of staphylococcal pathogenicity. Out of 200 strains of Staphylococcus aureus 118 strains (59%) fermented mannitol under anaerobic conditions. The majority of isolated strains of Staphylococcus aureus decomposed "mottled" carbohydrates with the formation of acid. Out of 200 strains 143 strains (71.5 %) decomposed mannitol. The peculiarities of Staphylococcus aureus growth on MPB include turbidity of the latter, sediment and film formation. From the total number of isolated Staphylococcus aureus strains, 48 (24%) caused cloudiness of the broth, 153 (76.5%) caused cloudiness and sedimentation and 9 strains caused turbidity with the formation of sediment and film.

DNA-ase activity of staphylococci in the determination of pathogenicity has gained great importance. This test is one of the most reliable in differentiating pathogenic from nonpathogenic staphylococci. Some coagulonegative staphylococcal strains have DNAase activity and can be confidently assigned to pathogenic strains. Of the 200 strains of Staphylococcus aureus, 152 strains (76%) exhibited DNase activity. This ability was absent in 48 strains (24%). Finally, the strongest and most reliable feature for determining the virulence of staphylococci is the rabbit and white mouse assay. The pathogenicity of 50 strains of this staphylococcus species was determined by a dermato-necrotic assay in white mice.

¹ Department of Microbiology, Virology and Immunology Samarkand State University Samarkand, Uzbekistan

² Department of Microbiology, Virology and Immunology Samarkand State University Samarkand, Uzbekistan

³ Department of Microbiology, Virology and Immunology Samarkand State University Samarkand, Uzbekistan

⁴ Department of Microbiology, Virology and Immunology Samarkand State University Samarkand, Uzbekistan

Of these, 32 strains showed positive dermonecrotic test with necrosis focus formation, 11 strains showed compatible test as abscess formation at the site of intradermal injection of the culture and 7 strains showed negative dermonecrotic test.

The last step in the study of *Staphylococcus aureus* was the determination of sensitivity to antibiotics using the paper disk method. The last step in the study of *Staphylococcus aureus* was the determination of sensitivity to antibiotics using the paper disks method. In almost all cases, the sensitivity of *Staphylococcus aureus* to antibiotics is high. Since the area of necrosis in experimental mice is also to some extent a criterion of pathogenicity of the strain studied, we cite all our observations: the area of necrosis 1.5 x 2 cm gave 1 strain, 1.5 x 2 cm - 1, 2 x 2.5 cm - 1, 2 x 2.5 cm - 4, 2.5 x 2.5 cm - 5, 2 x 3 cm - 5, 2.5 x 3 cm - 7, 2 x 3.5 cm - 7, 2.5 x 3.5 cm - 3, 3 x 4 cm - 2 strains. The sensitivity of staphylococci to antibiotics is high in almost all cases. The most sensitive MRSA we studied were to such antibiotics as benzyl penicillin, ampicillin, cephaloridin, erythromycin, oleandomycin, Lincomycin, Ristomycin and Novobiocin, less sensitive to methicillin, oxacillin, streptomycin, tetracycline, levomycetin, rifampicin, monomycin, gentamicin, and kanamycin.

Conclusions. Thus, microscopy showed microbes from the colony with typical staphylococcus aureus features as clusters of cocci resembling bunches of grapes. Since it was mentioned above that some strains of *Staphylococcus aureus* did not possess the plasmocoagulable and haemolytic activity, let us see how many such strains were in our studies strains possessing both DNA- and plasmocoagulable and haemolytic activity; some strains exhibited only plasmocoagulable and DNA-ase activity and were characterized by DNA-ase and haemolytic activity.

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