

Types of Staphylococcal Infection and their Significance in Medical Practice

Saburova Yulduz Tokhirovna

*Basic doctoral student of the Department of Hematology, Transfusiology and Laboratory Science
Tashkent Medical Academy, Uzbekistan*

Saidov Alonur Bakhtinurovich

*Doctor of Medical Sciences, Associate Professor Head of the Department of Hematology, Transfusiology
and Laboratory Science Tashkent Medical Academy, Uzbekistan*

Abstract: This article is devoted to the systematization of general knowledge about staphylococcus and the study of the relevance of this infection, taking into account its prevalence and percentage of carriers among the population regardless of the region. The diagnosis is made on the basis of cyto bacteroscopy of Gram-stained smears and cultural examination. The effectiveness of treatment of this infection depends on its resistance to one or another type of antibiotics used in therapy.

Keywords: bacteriocarriage, antibiotic resistance, staphylococcus, types of staphylococcus, ways of transmission of staphylococcus.

Introduction. Staphylococcus¹ is a genus of bacteria in the family Staphylococcaceae, including both opportunistic species and classical pathogenic microorganisms. Conditionally pathogenic microorganisms do not pose a threat in normal circumstances (the human immune system easily copes with them and they do not require treatment). But in the presence of favorable conditions, conditionally pathogenic representatives of the genus cause staphylococcal infection. Pathogenic types of staphylococcus can cause infection even in a healthy person.

The habitat of staphylococci is humans and warm-blooded animals, the external environment. Localization in humans – skin and mucous membranes, large intestine. The source of staphylococcal infections is a sick person or a healthy carrier. Transmission routes: airborne, airborne dust, contact, food.

The main part. Staphylococci (lat. Staphylococcus, from others -Greek: σταφυλή 'grape bunch' and κόκκος 'grain, berry') is a genus of bacteria in the Staphylococcaceae family. Representatives of this genus are immobile gram—positive cocci, whose cell diameter ranges from 0.6 to 1.2 microns. Representatives of the genus are characterized by division in several planes, which results in the arrangement of microbial cells in "grape clusters" in pure culture. Staphylococci are facultative anaerobes, chemoorganotrophs with an oxidative and enzymatic type of metabolism, catalanzopositive and oxidonegative. Non-spore-forming cells are usually uncapsulated, but some species, such as Staphylococcus aureus subsp. aureus, can form a capsule². Some staphylococci synthesize characteristic pigments. It should also be noted that staphylococci have a high sensitivity to silver ions (in solutions)³.

In total, about 40 species of staphylococcus are known. Most of them are harmless to humans. Staphylococci can be divided into 2 large groups depending on the ability to thrombosis by producing coagulase:

¹ Atlas of Medical Microbiology, Virology and Immunology / Edited by A. A. Vorobyov, A. S. Bykov. — M.: Medical Information Agency, 2003. — p. 35.

² Bergey's Manual of Systematic Bacteriology - Volume 3: The | Paul Vos | Springer.

³ Kulsky, L. A. Silver water. - 8 (add.). Moscow: Naukova Dumka publ., 1982, pp. 19-31.

- Coagulation-positive: a) *S. intermedius*
 - a) *S. aureus* (especially dangerous to humans)
- Coagulose-negative: a) *S. epidermitis*
 - b) *S. Haemoliticus*
 - c) *S. saprophyticus*
 - d) *S. hominis*

Three types — golden, epidermal and saprophytic staphylococcus — can cause infectious diseases. *Staphylococcus aureus* (Latin. *Staphylococcus aureus* is a species of globular gram—positive bacteria from the genus of *Staphylococcus*. The bacterium got its name due to its appearance under a microscope: unlike most bacteria, which are colorless, *Staphylococcus aureus* has a golden color due to pigments from the carotenoid group. Approximately 25-40% of the population are permanent carriers of this bacterium, which can persist on the skin and mucous membranes of the upper respiratory tract⁴. *S. aureus* can cause a wide range of diseases, starting with mild skin infections: acne, impetigo (*Streptococcus pyogenes* can also be caused), furuncle, phlegmon, carbuncle, staphylococcal burn-like skin syndrome and abscess — to deadly diseases: pneumonia, meningitis, osteomyelitis, endocarditis, infectious and toxic shock and sepsis. The range of diseases ranges from skin, soft tissues, respiratory, bone, joint and endovascular to wound infections. It is still one of the four most common causes of nosocomial infections, often causing postoperative wound infections.

A subspecies of *Staphylococcus aureus* should include resistant strains of staphylococcus - Methicillin-resistant *Staphylococcus aureus* (English Methicillin—resistant *Staphylococcus aureus*) - *Staphylococcus aureus*, which causes difficult-to-treat diseases in humans, such as sepsis, pneumonia. It is also called: *Staphylococcus aureus* with multidrug resistance, or oxacillin-resistant *Staphylococcus aureus*. Methicillin-resistant staphylococcus is any strain of the *Staphylococcus aureus* bacterium that is resistant to a large group of beta—lactam antibiotics (including penicillins, cephalosporins and carbapenems).

Epidermal staphylococcus (*Staphylococcus epidermidis*) is often found on human skin and mucous membranes, can cause sepsis, endocarditis, conjunctivitis, purulent wound infection and purulent urinary tract infections.

Saprophytic staphylococcus (*Staphylococcus saprophyticus*) — can cause acute cystitis and urethritis. It is also worth noting hemolytic *Staphylococcus* (*Staphylococcus haemolyticus*), which can cause various purulent inflammatory processes on different organs; sepsis and skin lesions, endocarditis; urethral lesions and cystitis.

Conclusion: Based on the reviewed material on the varieties of staphylococcus, it was determined that staphylococci are a common family of bacteria. The fact that they live on the human body and are widespread in nature suggests that a person is constantly in contact with them, which leads to the fact that, under certain conditions, the bacterium, entering the body, shows pathological activity and can cause inflammation of any organ or system. This leads to the development of the most dangerous diseases — sepsis, pneumonia, central nervous system disorder, general intoxication of the body. Given the possible complications of tissue damage, for example, *Staphylococcus aureus* is the most pathogenic; as a rule, it causes skin infections, can cause pneumonia, endocarditis and osteomyelitis. This pathogen usually leads to the formation of an abscess. Some strains produce toxins that can cause gastroenteritis, scalded skin syndrome and toxic shock syndrome. Further research in this direction may provide an opportunity to improve preventive measures, which in turn will to some extent help limit the wider spread of staphylococcus.

⁴ Kluytmans J., van Belkum A., Verbrugh H. Nasal carriage of *Staphylococcus aureus*: epidemiology, underlying mechanisms, and associated risks (англ.) // Microbiology and Molecular Biology Reviews[англ.] : journal. — American Society for Microbiology[англ.], 1997. — July (vol. 10, no. 3). — P. 505—520.

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