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Erythrocyte is the first line of blood antibacterial defense

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Background: After discovery of phagocytosis, it has become an axiom that blood cellular immunity is provided by leukocytes and in blood plasma phagocytes engulf, kill and digest germs. As to erythrocytes, it is generally accepted that they have no role in immune response and their main function is respiration. Our research provides objective video and photo evidence regarding erythrocyte bactericidal function.

Methods: Phase-contrast immersion vital microscopy of the blood of patients with bacteremia was performed and the process of bacteria entrapping and killing by erythrocytes was shot by means of video camera.

Results: Phase contrast microscopy reveals that erythrocytes take active part in blood bactericidal action entrapping and killing microorganisms. Video evidence demonstrates that human erythrocytes can repeatedly engulf and kill bacteria of different species and size.

Conclusion: The research demonstrates that erythrocytes are extremely important integral part of human blood cellular immunity. Compared with phagocytic leukocytes the erythrocytes (as cellular bactericidal agent) have the following advantages: (a) they are more numerous; (b) they are able to entrap and kill microorganisms again and again without being injured; (c) they are more resistant to infection and better withstand the attacks of pathogens; (d) they have longer life span and are produced faster; (e) their inner space filled with hemoglobin is inauspicious media for survival and proliferation of microbes and does not support replication of smaller intracellular parasitic organisms (chlamidiae, mycoplasmas, rickettsiae, viruses, etc.); (f) they are more effective and uncompromised bacterial killers. Blood cellular immunity theory and traditional view regarding the function of erythrocytes in human blood should be revised.

Biography

Place and date of birth: Yerevan, Armenia, April 29, 1953 Education: MD, Yerevan State Medical Institute, Armenia, 1976. Scientific degrees: Candidate of Medical sciences (PhD): Leningrad Military-Medical Academy, 1984. Doctor of Medical Sciences (DSci): Leningrad Military-Medical Academy, 1988. Research interests: Gastroenterology, Immunology, Bacteriology. Publications: over 80 peer-reviewed journal papers, 1 monography (book) "The Functional Blocks And The Problems Of Clinical Medicine", Moscow-Leningrad, 1990, 360 pp. 4 Patents regarding new methods of treatment. Memberships in professional societies: Academician of the Academy of Ecology (Russia) Member of the editorial board of "Russian Journal of Gastroenterology, Hepatology, Coloproctology" (Moscow).

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