

Psychology

Aggression and Protective Manifestation of the Cells

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ABSTRACT. The choice of the organism's protection is connected with peculiarities of specific antigen. Alpha-granule release is noted at such diagnosis as disabled children, Alzheimer, disseminated sclerosis, measles, alcoholism, etc. and there is no alpha-granule release at cancer, sepsis, vasculitis, atherosclerosis, myocardial infarction etc. Dense granule release leads to the growth of adrenalin in blood which is negatively revealed on the function of neurons causing "emotional agitation" in different forms. © 2008 Bull. Georg. Natl. Acad. Sci.

Key words: aggression, thrombocyte, alpha- and dense granules.

Aggression today is one of the fundamental problems of medicine. It is connected with disturbance of a person's behavior revealing a purposely directed action, i.e. the action the person (subject) is striving to.

The aim of our research is investigation of structural indices of blood corpuscles of people having committed a crime. The control group consisted of sportsmen before and after the competitions. Blood was taken as dynamic index of the changes occurring in the organism. Corpuscles were investigated by means of light and electron microscopes. For light microscopy the blood was taken from the finger. The smears were made, which after fixation were stained according to Andres' method (azure-II-eosin) and examined under light microscope "Photomicroscope-III", "Opton" (Germany). For electron microscopy we used microscope "BS-500", Tesla (Czech). Blood was taken from vein (3-4 ml). Leukocytic pellicle was obtained, finely cut and fixed in 1% solution of osmium. The material was poured into epon. Microscopic sections were contrasted by Reynolds' method and then examined under transmission electron microscope at accelerating potential 80 kV.

Clinical material is presented by 30 cases (15 cases of transgressors and 15 cases of control, junior sportsmen).

It is known that alpha- and different according to their contents dense granules are contained in the body of a thrombocyte. Their number is not large and they are located in the inner part of the thrombocyte.

As the examination shows, in thrombocytes of people who have committed a crime redistribution of granules is observed. Dense granules are located mainly on the edge of the thrombocyte. Their number is much larger than the quantity of alpha-granules. The excretion of dense granules out of thrombocytes is noted.

On the contrary, in junior sportsmen at loadings (competition) alpha-granules prevail in the thrombocytes. The number of alpha-granules is not great before the trainings. After the trainings alpha-granules, the number of which greatly increases, are mainly excreted.

'Neutrophils and lymphocytes also reveal some differences. In people who have committed a crime the nuclei of neutrophils and lymphocytes are mainly re-

pressed i.e. heterochromatin prevails in them the edge of the nuclei is twisted. The nuclei are often pyknotized

In nuclei of neutrophils and lymphocytes of sportsmen, on the contrary, euchromatin is revealed; the edge of the nucleus is even and pyknotic nuclei are not present.

Mitochondria of neutrophils and lymphocytes in criminals are mainly broken, agranular endoplasmatic reticulum prevails and a great number of ribosomes is noted. Lysosomes are compact, their number is not great.

As to the cytoplasm of neutrophils and lymphocytes of sportsmen-juniors mitochondria here are swollen, not broken and granular endoplasmatic reticulum prevails. There are no agglutinated ribosomes, the quantity of lysosomes is not big.

The fact should be taken into account that granules excreted (under exocytes) from thrombocytes are accumulated, mainly on the surface of neutrophils and lymphocytes. In the case of criminals they are mainly compact granules. In the case of sportsmen juniors (the blood was taken after the competition) mainly alpha-granules are revealed on the surface of neutrophils and lymphocytes.

It is known that both types of granules (alpha- and dense granules) are easily broken in blood plasma. However, a part of granules, not being broken, "manage" to penetrate into the cytoplasm of white corpuscles, which mainly concerns dense granules. Dense granules penetrating into cytoplasm play the role of lysosomes. Often the surface of dense granules may be surrounded by cisterns of agranular endoplasmatic net. Isolated structures, where, perhaps, phagocytic antigen is broken, appear.

Cytopathogenic effect, being present in neutrophils and lymphocytes may point to the virus genesis of antigen [1, 2].

Excretion of granules from thrombocytes according to Vashkinel [3] may be connected with the presence of virus antigen.

As is known, the fight with virus antigen may be presented as a phenomenon called clasmatosis, i.e. ex-

cretion of alien structures (viruses) from the body of the cell with its further destruction outside of it, where an "isolated" system will be created [4]. In the other case, the isolated system may appear not outside the cell but in the cell itself by isolation of cytoplasm differing in terms of the size of area with the help of cisterns of agranular endoplasmatic net. In the third case, as our observations showed, protective manifestations of the cell may be connected with thrombocytes which excrete dense granules from its body, the blood plasma being destroyed.

It is known that alpha granules contain a neuromediator – serotonin, while dense granules contain catecholamines, namely, adrenalin, nonadrenalin, lysosomal enzymes, and so on [3].

Serotonin, present in alpha granules in the blood of sportsmen, contributes to the activation of neurons, thus activating the functional abilities of CVS. As to adrenalin in the dense granules, it has sympaticomimetic action. This fact was proved by Academician L.Orbeli in the middle of the 20th century. Adrenalin participates in the series of biological processes: fast redistribution of blood, change of the state of blood depot, acceleration and strengthening of cardial work. Taking into account that thrombocytes create a depot of adrenalin in the human organism, which is very important fact, it increases excitation and contributes to manifestation of the so-called "emotional agitation".

It follows that aggression may have its biological explanation. Excretion of granules is conditioned by the cytopathogenic effect connected with the presence of virus antigen. Dense granules are excreted from thrombocytes to fight viruses having strictly specific character, this is the way the cell fights antigen.

Aggression is an affect which is connected with excretion of catecholamines (adrenalin, noradrenalin) from the destroyed dense granules into blood plasma. The presence of adrenalin in great quantity leads to strong emotional agitation – stress.

ფსიქოლოგია

აგრესიის ბიოლოგიური ასპექტები და უჯრედის დაცვითი გამოვლინებანი

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უჯრედის დაცვა დაკავშირებულია სპეციფიკური ანტიგენების თავისებურებასთან. ალფა-გრანულების ამოგდება თრომბოციტებიდან აღინიშნება სხვადასხვა დაავადებებში. აგრესია შეიძლება განხილულ იქნას როგორც პიროვნების ქცევის დარღვევა. ქცევის დარღვევა კი დაკავშირებულია ორგანიზმში მთელ რიგ ფაქტორებთან, მათ შორის ორგანიზმის სხვადასხვა სისტემის ურთიერთკავშირის დარღვევასთან. აგრესია, ამასთან, შეიძლება განვიხილოთ როგორც სოციალური მოვლენა, რომელიც მიმართულია ჰომეოსტაზის შენარჩუნებასთან. ის დაკავშირებულია აგრეთვე მთელ რიგ სტრუქტურულ ცვლილებებთან.

REFERENCES

1. R.D. Kornberg (1974), Chromatic Structure: Science, **184**: 868-871.
2. В.Д. Соловьев и др. (1988), Очерки по вирусной цитологии, М.
3. А. Вашкинел, М. Петров (1999), Ультраструктуры и функции тромбоцитов человека, С.-Пб.
4. А. Ленинджер (1988), Биохимия, М.

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