Influence of bioresonance therapy on the process of normalization of the leukocyte count of peripheral blood against the background of immunosuppression, caused by the administration of cyclophosphamide

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Over the past decades, the action of weak and superweak low-intensity factors has attracted the attention of an increasing number of scientists from various fields of science. The successes achieved in the practical use of many superweak and weak factors stimulated science to study the possible mechanisms of such influences.

Bioresonance therapy is one of the methods of information-wave exposure of the human body to ultra-low-power electromagnetic radiation in the range of biologically significant frequencies. The methods of bioresonance exposure are based on the window-frequency resonance effects of weak electromagnetic fields, to which the body exhibits high selective sensitivity. The effects are realized through the thalamo and hypothalamic-pituitary system due to the regulation of bioelectric metabolic processes of neurotransmitters, endorphin and immune systems, hormonal activity of the endocrine glands, improvement of neuro- and general hemodynamics. As a result, microcirculation, general and peripheral blood circulation are normalized, rheological properties of blood are improved, anti-inflammatory, desensitizing and mild sedative effects are formed [1].

PURPOSE of this study: study of the effect of bioresonance therapy (BRT) on the process of normalization of the peripheral blood formula in white mice against the background of immunosuppression caused by the administration of cyclophosphamide (CP).

Material and research methods

Research objects

1. Sexually mature white mice (20–25 g), (n = 265).
2. Sexually mature white rats (150–170 g), (n = 52).
3. Seven day old white rats (6–8 years old), (n = 12). The animals were divided into control and experimental groups.

I. Control group: intact animals.

II. Experimental group: animals injected with cyclophosphamide (single injection).

Group No. 9 - white mice that received a single injection of cyclophosphamide (leukopenia model);

III. Experimental group: animals that received BRT sessions after CP administration.

Group No. 10 - white mice, which received a single injection of cyclophosphamide + seven sessions of BRT (BRT, 4 strategies every other day, duration - 20 min.).

Research methods

Research material: peripheral blood of experimental animals (mice and rats).

The following were used as a criterion for the effectiveness of the therapy:

determination of the total number of leukocytes in the peripheral blood (Goryaev's chamber);

determination of the leukocyte formula on peripheral blood smears.

Blood was taken from the tails of animals. The total number of leukocytes was counted in the Goryaev chamber using a light microscope (magnification 10 × 15). Blood smears were prepared in parallel. Blood smear preparations after fixation for 5 min. in the fixative of Main-Grunwald, washed with distilled water. Giemsa dye (EUROTURBO, DELTALAB, Spain) was used to stain (30 min) the washed preparations. The colored preparations were transferred into running water. Calculation of the leukocyte formula was carried out in a light microscope (magnification 90 × 10). The reliability of the data obtained was assessed by the Student criterion.

Bioresonance therapy in swing mode and 4 strategies was carried out at the APK "IMEDIS-EXPERT

The model of immunosuppression (leukopenia) was induced by a single intraperitoneal administration of cyclophosphamide at a dose of 280 mg per 1 kg of body weight.

Pharmacological action of cyclophosphamide (CYCLOPHOSPHAMIDE): antitumor agent of alkylating action. It has a cytostatic and immunosuppressive effect. The antitumor effect is realized directly in tumor cells, where cyclophosphamide is biotransformed under the action of phosphatases, with the formation of an active metabolite with an alkylating effect.

Pharmacokinetics: After a single intravenous injection, the concentration of cyclophosphamide and its metabolites in plasma rapidly decreases in the first 24 hours, but can be determined within 72 hours. When ingested, the concentrations of cyclophosphamide and its metabolites are practically the same as when administered intravenously. The plasma half-life after intravenous administration is on average 7 hours in adults and about 4 hours in children. It is excreted in urine and bile. Experimental studies have established teratogenic and embryotoxic effects of cyclophosphamide.

Side effect [3]:

- from the digestive system: nausea, vomiting, diarrhea, stomach pain; rarely - toxic hepatitis;
- from the hematopoietic system: leukopenia, thrombocytopenia, anemia;
- from the respiratory system: with prolonged use of high doses
- pneumonia or interstitial pulmonary fibrosis;
- on the part of the cardiovascular system: tachycardia, shortness of breath, acute pericarditis; in some cases - severe heart failure (associated with hemorrhagic myocarditis and myocardial necrosis);
- from the urinary system: aseptic hemorrhagic cystitis, nephropathy (associated with hyperuricemia);
- on the part of the reproductive system: menstrual irregularities,

amenorrhea, azoospermia;

- allergic reactions: skin rash, urticaria, anaphylactic reactions;

- others: alopecia, muscle and bone pain, headache.

Considering the above side effects of cyclophosphamide (CP), we were faced with the following tasks:

1. Eliminate the toxic effect of CF.
2. Remove decay products from the body, enhance the drainage functions of the liver, kidneys, intestines, lymph.
3. Stimulation of hematopoiesis.
4. Stimulation of the immune system (lymph nodes, spleen, thymus, bone marrow, lymphoid tissue of the walls of the respiratory and digestive systems, tonsils, group and single lymphoid nodules of the ileum).

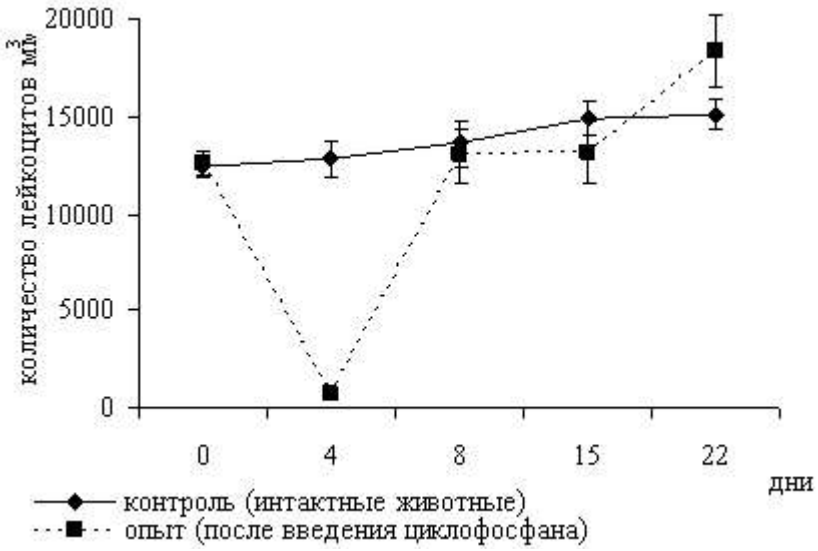
The BRT algorithm according to strategy IV was as follows:

1. Before the introduction of CP, a drop of blood was taken from the tail of each mouse and rewritten onto sugar crumbs (from the 2nd to 1 container)
- individual rate. Later, in the process of BRT, 1 grain recorded from each mouse was placed into 2 containers of the apparatus (load mode).

2. An electrode in the form of a magnetic belt was placed around a cardboard box, inside of which the experimental animals were kept by the whole group, and was connected to the outlet of the frontal electrodes.
3. Intraperitoneal administration of a single dose of CP.
4. In 1 hour after the introduction of CP in the mode of rocking the BRT for 15 sec. 1 container was used to record the sugar crumbs. Then this grits were transferred to 3 containers (inversion mode).
5. Container 3 contained a single dose of CP.
6. From the drug selector in the BRT process, organic preparations were connected: blood, lymphocytes, erythrocytes, platelets, spleen, thymus, lymph nodes, lymphoid follicles, bone marrow, bone marrow, stem cells, stomach, intestines, intestinal lymph nodes, lungs, heart, liver, kidneys in potency D0-D200., as well as drainage preparations of the company "ONOM": DRE of blood, spleen, RES, DRE of the liver, biliary tract, pancreas, DRE of the gastrointestinal tract, DRE of lymph, DRE of the respiratory tract, immunostimulants. (load mode).
7. Against the background of inversion and loading with the above drugs, BRT was performed in the swing mode along all meridians for 20 minutes. At the end of the BRT for 3 min. recording of e / m vibrations on sugar crumbs was carried out. The BR-drug recorded in this way was subsequently dissolved in 7-10 grains in 500 ml of water and given to the mice instead of drinking water. After each BRT session, the BR-drug was changed to a new one.

Change in the number of leukocytes in the peripheral blood of mice after single administration of cyclophosphamide

Animals (group No. 9) were injected intraperitoneally with cyclophosphamide (280 mg per 1 kg of body weight). It was found that on the 4th day after a single injection of cyclophosphamide in the peripheral blood of white mice, the total number of leukocytes sharply decreases (Fig. 1).



Rice. one.Change in the number of leukocytes in the peripheral blood of mice in normal conditions and after a single administration of cyclophosphamide

In response to leukopenia developed due to the effect of a cytotoxic drug, an increase in the total number of leukocytes (blood regeneration) is observed after 8 days (Fig. 1).

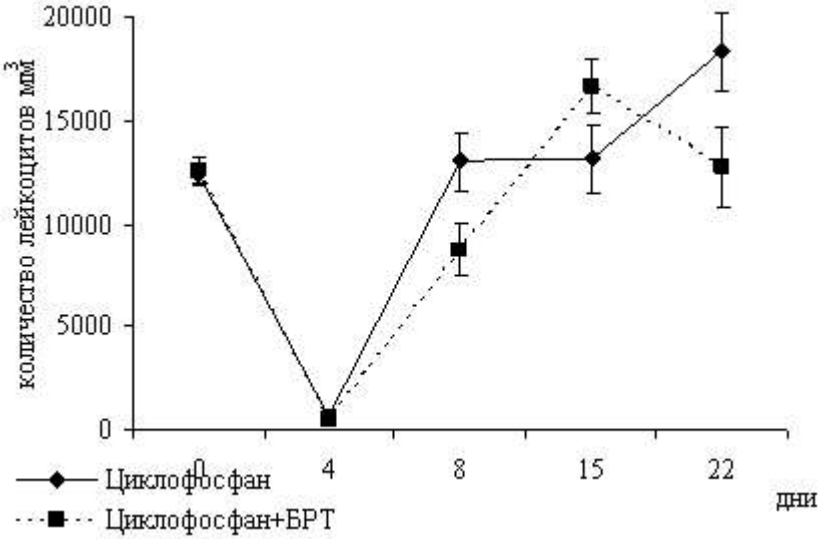
Influence of BRT on the process of normalization of the peripheral blood count mice after a single injection of cyclophosphamide

The animals of this group (group No. 10), one hour after the injection of cyclophosphamide, began to have BRT sessions (20 minutes). The therapy sessions were carried out every other day for two weeks.

Fig. 2 shows that the number of leukocytes in the blood of animals of this group also sharply decreases on the 4th day after the injection of cyclophosphamide. Comparative analysis of the curves showed that the difference in the indicators of both groups of animals was not observed. The increase in the total number of leukocytes on the eighth day occurs in both groups 9 and 10.

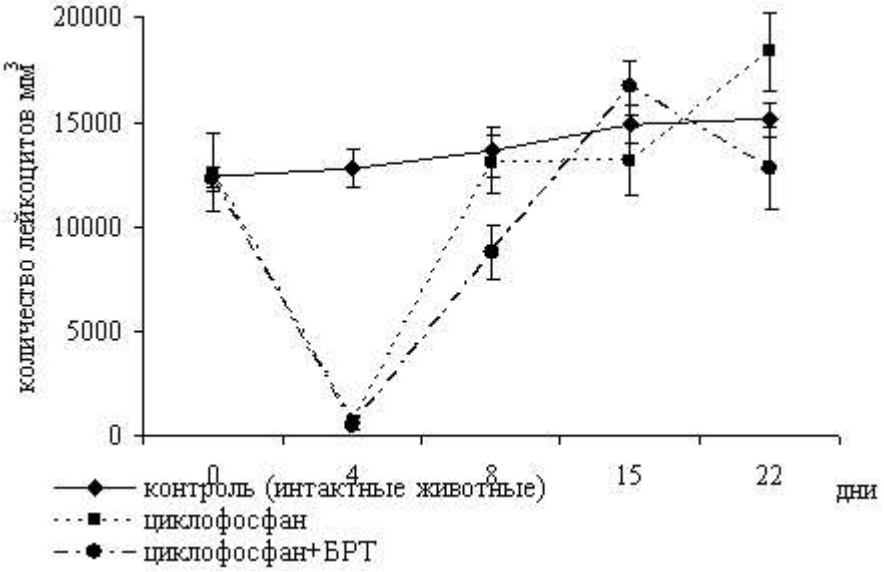
From which it follows that in case of leukopenia, three BRT sessions do not accelerate the process of normalization of the leukocyte blood count. A significant increase in leukocytes was detected only after two weeks. The number of leukocytes is 21% higher than the corresponding indicator of animals of the 9th group (Fig. 2).

In fig. 3 shows the curves of normalization of the peripheral blood of intact animals (group 1a) and experimental groups (groups 9 and 10).

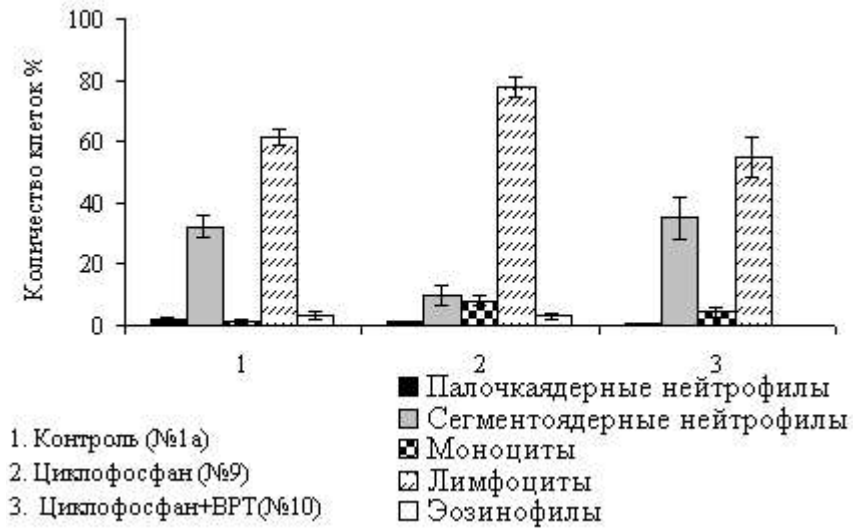


Rice. 2.Influence of BRT on the process of normalization of the peripheral blood formula in mice after a single administration of cyclophosphamide

Below, in Fig. Figures 4–7 show diagrams reflecting changes in the percentage ratios of individual cellular blood types of animals in intact (1a) and experimental groups (No. 9 and No. 10) by day (4th, 8th, 15th and 22nd).



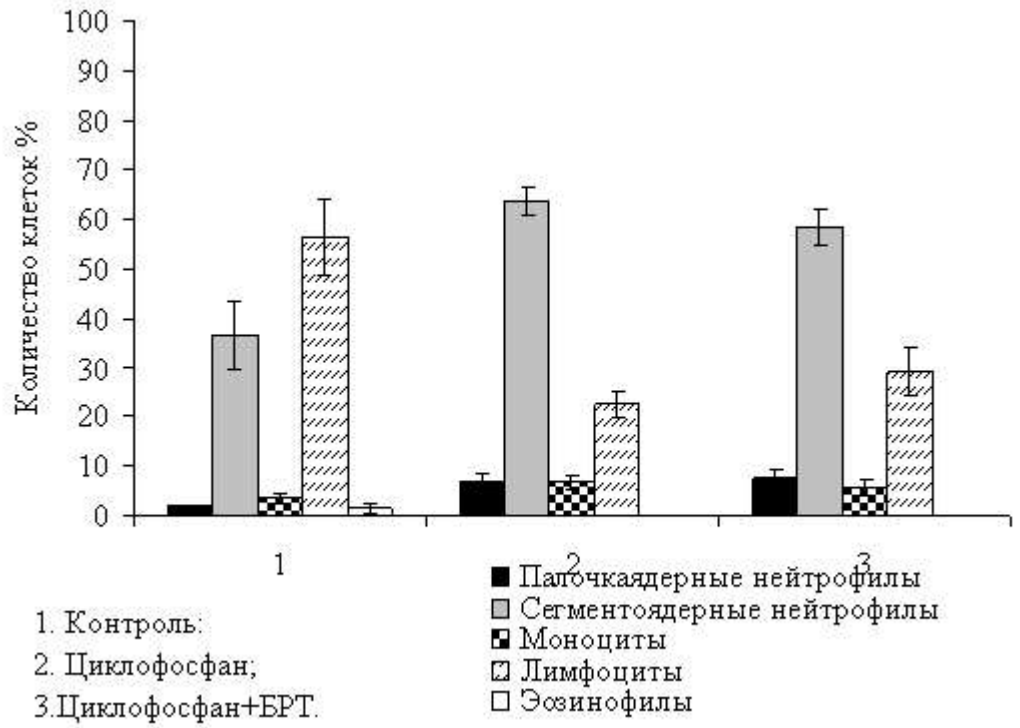
Rice. 3.Influence of BRT on the process of normalization of the peripheral blood formula in mice after a single administration of cyclophosphamide



Rice. 4.Change in the number of cell types of blood of animals intact (No. 1a) and experimental groups (No. 9 and No. 10. 4th day after administration of cyclophosphamide)

In fig. 4 shows the results of a comparative analysis of changes in the ratio of cell types of leukocytes in the blood of intact (No. 1a) and experimental (No. 9 and No. 10) mice on the 4th day after administration of cyclophosphamide. As noted above, at this time, the total number of leukocytes decreases sharply (Fig. 1). The introduction of cyclophosphamide, according to the diagrams shown in Fig. 4, causes changes in the percentage of leukocytes. So, for example, the number of segmented neutrophils in the blood of animals of group No. 9 decreases by 20% (Fig. 4). Accordingly, the proportion (in percent) of lymphocytes increases, from which it follows that after 4 days the cytotoxic effect of cyclophosphamide on this cell population is less pronounced and mainly manifests itself in relation to peripheral blood neutrophils of mice.

On the 4th day, the total number of leukocytes was also decreased in the blood of animals of the 10th group, which underwent BRT (Fig. 4). However, unlike animals of group No. 9, the percentage of individual cell types does not change (Fig. 4).



Rice. five.Change in the number of blood cell types of animals in intact and experimental groups (8th day after administration of cyclophosphamide)

Based on the results obtained, it can be assumed that:

1. Against the background of BRT, the cytotoxic effect of cyclophosphamide decreases (in 4 days) or,

2. BRT contributes to the normalization of the leukocyte blood count.

The total number of leukocytes, as mentioned above, (Fig. 5) sharply increases on the 8th day after the injection of cyclophosphamide in the blood of animals in groups No. 9 and No. 10.

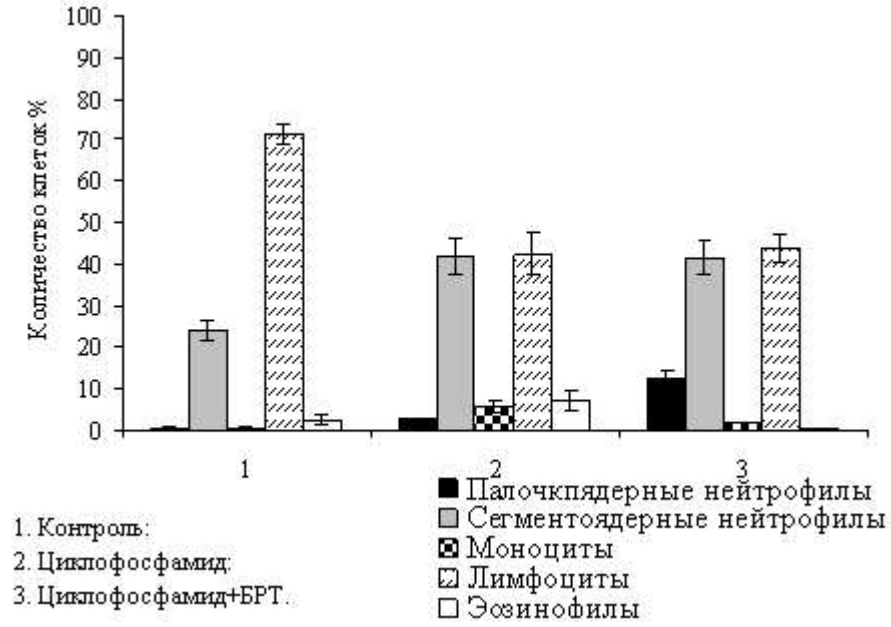
The analysis of smears showed that in the experimental groups the percentage of different types of leukocytes differs from the norm. In particular, an increase in the percentage of neutrophils was found both in group No. 9, as well as in the blood of experimental mice that underwent BRT (group No. 10). Studies have also shown that, in the peripheral blood of experimental animals, not only the proportion of mature, but also immature neutrophils grows (Fig. 5).

The maximum value of the total number of leukocytes, as can be seen from Fig. 6. observed after seven sessions of BRT (15th day after the injection of cyclophosphamide). However, the normalization of the ratio of cell types has not yet been achieved in any of the experimental groups No. 9 and No. 10 (Fig. 6).

It should be noted that two weeks after the injection of cyclophosphamide, the percentage of immature forms of neutrophils circulating in the blood of animals undergoing BRT significantly increases (Fig. 6).

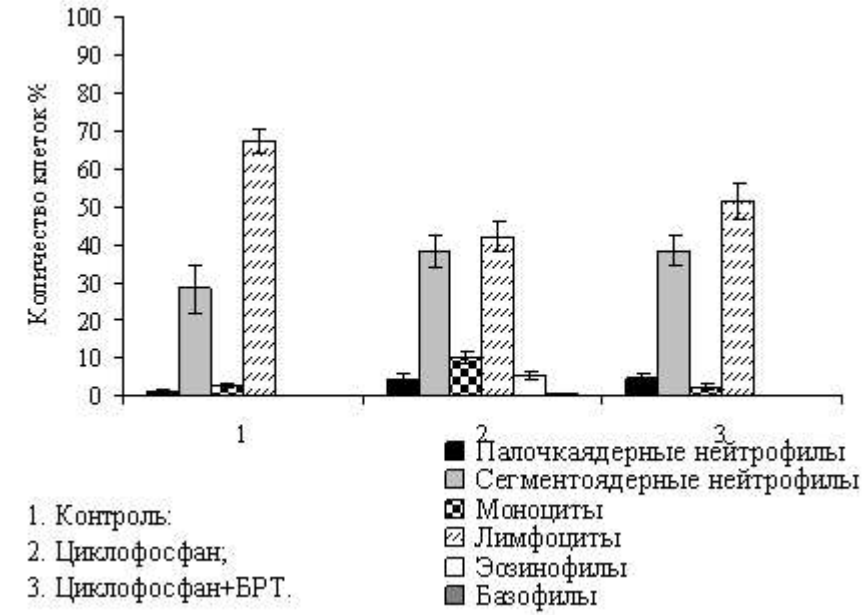
Fig. 7 also shows that on the 22nd day after the injection of cyclophosphamide in the peripheral blood of animals of group No. 9, the total number of leukocytes remains at the control level. The corresponding indicator of the animals of group No. 10 also returned to the norm, for which the BRT sessions were stopped on the 15th day after the injection of cyclophosphamide (Fig. 7). However, the analysis

blood smears of animals of both groups showed that the percentage of different forms of leukocytes is not yet normal (Fig. 7).



Rice. 6.Change in the number of blood cell types of animals in intact and experimental groups (15th day after administration of cyclophosphamide)

It should be noted that the tendency for the cellular composition of the blood formula to return to normal was more pronounced in the group of animals that underwent BRT.



Rice. 7.Change in the number of cell types of leukocyte blood count of animals of intact (No. 1a) and experimental (No. 9 and No. 10) groups (22nd day after administration of cyclophosphamide)

From the results obtained on the model of white mouse leukopenia, it follows that BRT sessions every other day for two weeks contribute to the restoration of the peripheral blood formula of animals.

CONCLUSIONS

1. BRT contributes to the normalization of the leukocyte count of the peripheral blood of mice with pronounced leukopenia.
2. Correction of disorders of the leukocyte blood count of mice, characteristic of leukopenia, is achieved by increasing the number of immature leukocytes.

Bibliography

1. Rehabilitation of cardiac patients / Ed. K.V. Lyadova, V.N. Preobrazhensky. - M: GEOTAR-Media, 2005. - P. 61.
2. Gotovsky Yu.V. Bioresonance and multiresonance therapy // A.V. Samokhin, Yu.V. Gotovsky. Electropuncture diagnostics and therapy by the method of R. Voll. - M .: IMEDIS, 1995. - S. 359–367.
3. Directory VIDAL, 2005.

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"- M .:" IMEDIS ", 2008, vol. 1 - C.3-13