



Changes in the immune system after long-term radiation for cervical cancer treatment

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Purpose of research - Immunity of patients with cervical cancer compared in groups with radiation injuries and without any complications in the long term after combined radiation therapy. Immune disorders were revealed depending on the difference in radiation doses, as well as not related to differences in radiation doses.

Materials and methods

173 women were examined with radiation injuries (intrapelvic fibrosis, cystitis, rectitis) 1-20 years after the course of combined treatment. 37 women made a control group without radiation injuries of radiation therapy. The combined therapy included irradiation of the zone of intersection of uterine and ureter vessels, point A; area of parametrial and lymph node metastasis, point B; zone of the nearest location of the cervix to the bladder and rectum, point V and R. The total focal dose of radiation was in the group with radiation damage: p. A 77 ± 12 Gy; p. B 54 ± 8 Gy; p. V 48 ± 15 Gy; p. R 39 ± 11 Gy. The total focal dose of radiation was in the group of patients without radiation injury: p. A 69 ± 14 Gy; p. B 51 ± 6 Gy; p. V 46 ± 11 Gy; p. R 37 ± 9 Gy. The relative and absolute number of T-helpers, T-cytotoxic, T -, B -, NK-cells, phagocytes and their functional state were estimated in the immune status.

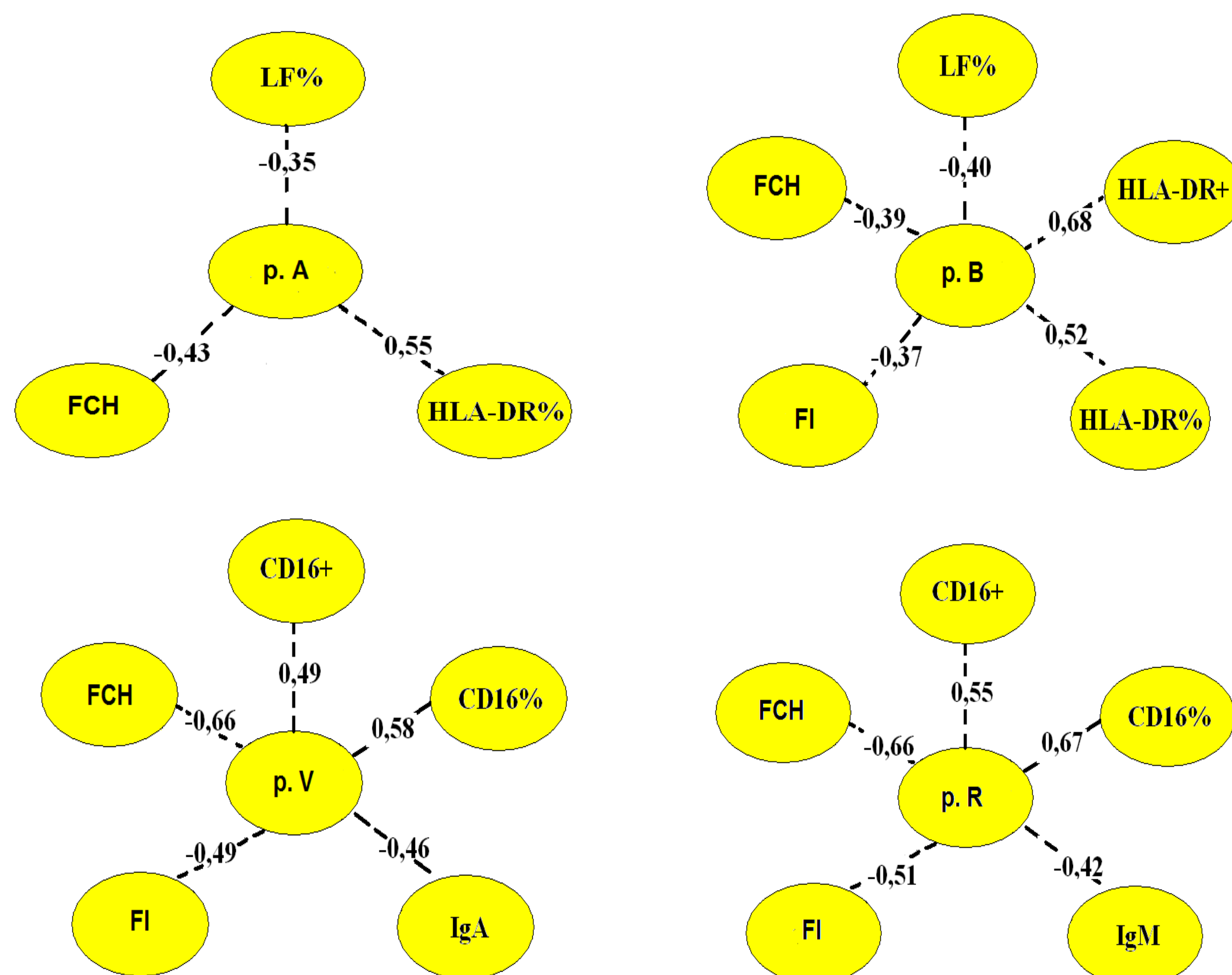
Main results

A statistically significant link between the decrease in immunity and the total focal dose of radiation is revealed in the group without radiation damage (mainly with the dose given on pp. V and R). The number of T-helpers and the ratio of primary immune response (concentration of IgM), also concentration IgA; phagocytosis are reduced; the percentage and number of NK cells are increased. Some differences in the reactivity of the immune system, which were identified, in partially may be due to differences in the total focal dose of radiation, summed to pp. A and B (Fig. 1, Table 1). Some revealed violations can be explained by differences in individual tolerance, contributing to the development of radiation damage in some patients, and the degree of their severity.

Conclusion

The results justify the need for strict compliance with the recommended tolerance doses. However, immune disorders in some patients are detected even with the general observance of tolerance in doses. The search and introduction of new treatments is also a prerequisite for reducing radiation exposure without reducing the effectiveness of therapy.

Group without radiation damage



Group with radiation damage

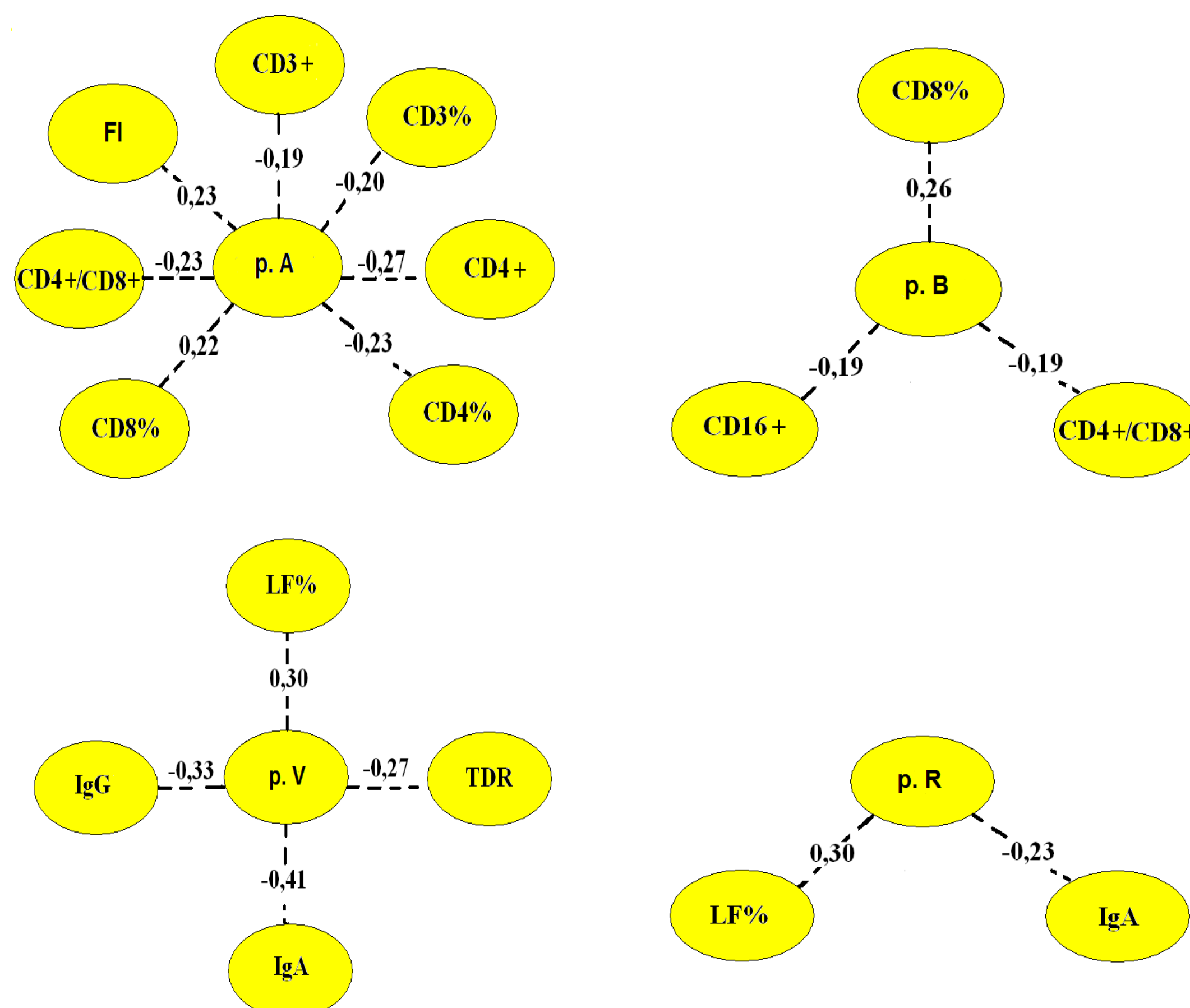


Fig. 1. Correlation relationships of doses of irradiation on pp. A, B, V, R with indicators of immunity

Table 1. The total focal dose of radiation of patients with cervical cancer at the control points

Dose of radiation, Gy	Group without radiation damage	Group with radiation damage
p. A	69 ± 14	77 ± 12 *
p. B	51 ± 6	54 ± 8 *
p. V	46 ± 11	48 ± 15
p. R	37 ± 9	39 ± 11

*- Differences are statistically significant, $p < 0.05$.