Myeloproliferative Disorders in Chickens: Radiation Induced Apoptosis, Relation to TAS.

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The study of apoptotic cascade in avian medicine may help in early detection and prevention of aquired immunodeficiency caused by the influence of a variety of pathogenic and non-pathogenic environmental factors, which may result in severe economical losses in conditions of intensive poultry farming. The aim of the present work were the study of immunosuppression and apoptotic cascade and possibilities of application of tissue microarray (TMA) in chicken in experimental conditions and diagnostics in avian medicine in general. TMA technology allows rapid visualization of molecular targets in thousands of tissue specimens at a time, either at the DNA, RNA or protein level. The technique facilitates rapid translation of molecular findings to clinical applications.The selection of samples from avian primary immune organs: thymus, Bursa Fabricii and bone marrow was done after gamma irradiation and infectious bursal virus infection (IBDV). For gamma radiation 80 cross-breed chickens (female) at 37 days of age were used, and Chisostat (Chirana) source 60Co 95 cm, SSD, 0.33 Gy/min, total dose: 3 Gy, 4 Gy, and 4.5 Gy, 1, 6 and 24 hrs after irradiation. Following apoptosis in B. Fabricii we used Bcl 2 and p-53 immmunohistochemical stains for the detection of mitochondrial pathway. Bcl 2-proapoptotic protein is released upon apoptotic response. In simmilar manner we detected protein p-53 DO-1 nonmutant variant. The expression of p53 and Bcl 2 in comparative study in avian thymus and Bursa Fabricii after irradiation does not differ from the one in human tissues. Gamma radiation caused the increase of the proportion of cells in apoptosis. There are significant differences in the pattern of DNA content distribution between the different treatment types. Irradiation caused increase in cells in the G 2/M phase of the cell cycle. Oxidative stress as an initial disorder as well as the signal transduced by reactive oxygen species play an important role in radiation induced apoptosis. Total antioxidant status (TAS) increase could be a result of release of intracellular antioxidants from damaged cells in the IBD.

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