Medical management of Acute Radiation Syndromes:Immunotherapy by Antiradiation Immunoglobulin G .

D. Popov[a] and V. Maliev[b]

[a] *Advanced Medical Technologies & Systems. Inc., Cozens Dr.,, ON L4E4W8 Richmond Hill, Canada;* [b] *Russian Academy of Science, 93 Koosta Hetagyrova pr, 362008 Vladicaucas, Russian Federation*

dlpopov@fcibroadband.com

Immunoglobulins is an important part of Acquired Immunity and participate in such important immunological processes as recognition, regulation and elimination of foreign antigens. At the present time, Intravenous Immunoglobulins are used for an efficient therapy for immune deficiency syndromes, thrombocytopenias, inflammatory reactions, modulation of autoimmunity and a wide range of hematologic disorders. Traditionally, the treatment of Acute Radiation Syndromes (ARS) includes supportive therapy, cytokine therapy, blood component transfusions and stem cell transplantation. However, results of treatment of ARS remain limited and in cases of severe radiation injury insufficient. Studies of therapy effects of Anti-radiation Immunoglobulin G in vivo have established that specific antibodies to Radiation Toxins of SRD group can be important, effective part of medical management of ARS and can play a significant role in neutralization of radiation induced toxicity. Multiple-organ failure at Acute Radiation Syndromes is a major cause of mortality after high doses of gamma irradiation. Radiation Toxins of Specific Radiation Deteminant group(neuro-toxic, neuro-vascular-toxic, entero-toxic, hemato-toxic) play an important role in development of Acute Radiation Syndromes and development of multi-organ involvement and multi-organ failure. Radiation Toxins possess high toxic properties. Radiation Neurotoxin isolated from lymphatic system of irradiated animals (with a clinical picture of cerebral radiation syndrome) and injected to healthy animals in toxic doses 0.03 mg/kg, 0.5 mg/kg, 10.0 mg/kg, 15.0 mg/kg had initiated development of acute failure of blood circulation and breathing ventilation. Death of laboratory animals had occurred within 5 min-3 days after injection of toxic doses of Radiation Neuro-Toxin and depended on a concentration and a type of active substance of Radiation Toxins. Hyper-immunization of non-irradiated animals by non-toxic doses of Radiation Toxins were provided. The immunoglobulin fraction of pooled hyperimmune anti-radiation plasma was separated. Immunoglobulines to Radiation Toxins were used for a treatment of Acute Radiation Syndromes and the efficacy of this bio-pharmaceutical agent was initially evaluated. Therapeutic application of Specific Anti-radiation Immunoglobulin had significantly diminished mortality rate at Acute Radiation Syndromes and was much more effective compare with natural immunoglobulins preparations and irradiated forms of natural irradiated immunoglobulins.

Article published by EDP Sciences and available at http://www.radioprotection.org or http://dx.doi.org/10.1051/radiopro:2008513