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Application of IgY antibodies against intestinal pathogen resulted in reduction of acute graft-versus-host disease in murine model

Abdellatif Bouazzaoui

Umm AlQura University, Saudi Arabia

Graft Versus Host Disease (GVHD) remains the major cause of morbidity and mortality after allogeneic stem cell transplantation despite the use of modern immunosuppressive drugs. For this reason, new methods for prophylaxis and treatment of GVHD are urgently needed. One approach is the blocking of bacterial endotoxins or reduction of pathogenic bacteria. Using a haploidentical murine model, B6D2F1 mice conditioned with Total Body Irradiation (TBI) received Bone Marrow cells (BM) and Splenocytes (SC) from either syngeneic (Syn=B6D2F1) or allogeneic (Allo=C57BL/6) donors. After that, animals received from day -2 until day +28 chow contained hen antibodies (IgY=Immunoglobulin Yolk). In alternative protocol the animals received chow from day-2 until day 15. Thereafter severity of a GVHD, microbial constitution, cytokines, chemokines and Pathogen-Associated Molecular Patterns products (PAMP) were analyzed and compared to control animals (received chow without IgY). It was found that animals receiving chow with IgY antibody showed reduced GVHD severity and improved survival compared to control animals. On day 28 after alloBMT, the organ damages of IgY treated animals were reduced and associated with significantly diminished expression of inflammatory cytokines in the serum. Interestingly the GVHD improvement in the animals treated with IgY chow correlated with a significant decrease in *E. coli* and Bacteroidetes bacteria 15 days after transplantation whereas the *L. reuteri* and Firmicutes bacteria were significantly increased. In conclusion, feed pellets containing IgY antibodies improved GVHD and reduced the cytokine and pathogen receptor (NOD2, TLR2 and 4) expression which may involve decrease of *E. coli* and increase of *Lactobacillus* load.

alazzaoui@uqu.edu.sa

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