

Commentary of Pr. Guido Ferlazzo to:

Lee et al. A Case-Control Study on the Changes in Natural Killer Cell Activity following Administration of Polyvalent Mechanical Bacterial Lysate in Korean Adults with Recurrent Respiratory Tract Infection. *J. Clin. Med.* 2022, 11, 3014.

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Natural Killer (NK) cells are innate lymphocytes that act at the initial phase of the immune response and are endowed with the capability of killing viral infected and cancer cells. As a matter of fact, they can contain viral spreading until the adaptive immune response (T and B lymphocytes) will undergo clonal expansion and eventually control the infection by an antigen-specific recognition of the virus and of the infected cells. Therefore, NK cells play a pivotal role at the forefront of viral infection and an efficient NK cell activity is definitely associated to a better resistance against different viruses. In addition, because mucosal tissues damaged by viruses become more susceptible to bacterial infection, NK cell activity are considered critical also for preventing the invasion by other pathogens. That holds particularly true for the respiratory tract, where bacterial co-pathogens are commonly identified in viral respiratory infections and are important causes of morbidity and mortality.

In the present study, Lee and collaborators analyzed NK cell activity in a cohort of patients affected by recurrent respiratory infections. Because the protective effects of NK cells are associated to the release of Interferon (IFN)-gamma, a cardinal cytokine in human immune response, the production of IFN-gamma by NK cells was employed as an indicator of NK cell activity. Noteworthy, they observed that administration of PMBL in these patients resulted in a consistent increase of their NK cell activities.

Although the fine mechanism of action by which PMBL can activate NK cells remains to be fully elucidated, we can speculate that this occur via accessory cells such as dendritic cells, which have been shown to represent early activators of NK cells during the innate immune response. Because PMBL are strong activators of dendritic cells via the recognition of Pathogen Associated Molecular Patterns, widely contained in PMBL, it's easy to hypothesize that the array of pro-inflammatory cytokines released by dendritic cells encountering PMBL could be able, in turn, to induce a robust activation of the NK cell compartment.



In conclusion, this study emphasizes as the administration of PMBL, in addition to their direct anti-bacterial properties, can also boost the functions of this subset of innate lymphocytes, particularly capable in defending our bodies against viral infections. In times when viral pandemic represents a global concern, these results should be taken in very high consideration when treating patients affected by recurrent respiratory infections, who also represent a category of subjects particularly vulnerable to SARS-CoV2 infection.