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Analysis of infection Rate According to Natural Killer Cell Activity in Hemodialysis Patients

Seok-hyung Kim, Moon Hyoung Lee, Ki Sung Kim, Kwon Soo Jung, Tae Hoon Kim, Hyunwook Kim, Hoon Young Choi, Hyeong Cheon Park
Department of Internal Medicine-Nephrology, Gangnam Severance Hospital, Korea, Republic of

Objectives:

Natural killer (NK) cells are lymphocytes of innate immune system that play a key role in host defense against diverse range of pathogens. NK cell deficit has been suggested in patients undergoing hemodialysis (HD) with conflicting results regarding their activity and linked to impaired antimicrobial activity in host defense. Aim of this study was to determine the susceptibility to bacterial infection according to NK cell cytotoxic activity in HD patients using a high-throughput assay.

Methods: We enrolled 128 patients receiving HD over three months from single outpatient HD clinic. We excluded patients with active malignancy or those taking immunosuppressant drugs such as glucocorticoid. NK cell activity was analyzed at six-month intervals from 2015 to 2017. We investigated the incidence of major infections requiring intravenous antibiotics or hospitalization from 2015 to 2017. NK cell activity was assessed using NK Vue™ assay (ATGen Co.) that uses serum of ex vivo stimulated whole blood to detect interferon (IFN)-γ secreted from NK cells as an indicator of NK cell activity.

Results:

Mean age was 64.8 ± 13.8 years. During study period, 112 major infections occurred. Mean NK cell activity was 663.6 ± 753.2 pg/mL. Decreases in NK cell activity were significantly correlated with incidence of major infections. Mean changes in NK cell activity were respectively -239.6 ± 745.4 pg/mL in the period which infections have occurred and 54.5 ± 871.0 pg/mL in the period which infection have not occurred (P=0.002).

Conclusions: Our results showed significantly more decrease in NK cell activity in period of infection.