Characterization of the therapeutic increases in natural killer (NK) activity of xenotropic murine leukemia virus-related virus (XMRV)-positive chronic fatigue syndrome (CFS) patients effected by poly (I): poly (C12U) (Ampligen)

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ABSTRACT: Chronic Fatigue Syndrome (CFS) is a debilitating disease of unknown etiology that affects ~17 million people worldwide. Patients suffer persistent viral infections and may develop hematopoietic malignancies. The patients have reduced Natural Killer (NK) cell activities which could contribute to the diseases, and, if restored, potentially reduce symptoms. We characterized the in vitro effects on NK cells of the interferon inducer poly (I): poly (C12U) (Ampligen) which in some CFS patients abates disease symptoms. The 30 CFS patients were infected with the gammaretrovirus xenotropic murine leukemia virus-related virus (XMRV). We cultured their peripheral blood mononuclear cells with the drug for 24 hrs and monitor NK activity to K562 cells by flow cytometry, concurrently measuring degranulation by externalization of CD107a, and expression of Grz B and perforin. Treatment markedly increased CD107a externalization in the NK cell population as indicated by 5-fold increases in CD107a-positive cell frequencies and 3-fold increases in their CD107a MFI, with slight positive shifts in intracellular Grz B and perforin. In contrast, T cells showed little change in CD107a externalization. Our results suggest that degranulation rates may be more affected than the levels of cytotoxic proteins, indicating a novel mechanism by which NK activity was affected by the drug. The increase in degranulation per NK cell indicates a mechanism by which Ampligen treatment can improve NK cell function.