**Investigation**

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**Increased tumor necrosis factor alpha (TNF-alpha) and natural killer cell (NK) function using an integrative approach in late stage cancers.**

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Natural products may increase cytotoxic activity of Natural Killer Cells (NK) Tumor Necrosis Factor alpha (TNF-alpha) while decreasing DNA damage in patients with late-stage cancer. Pilot studies have suggested that a combination of Nutraceuticals can raise NK cell function and TNF-alpha activity and result in improved clinical outcomes in patients with late stage cancer. The objective of the study is to determine if Nutraceuticals can significantly raise NK function and TNF levels in patients with late stage cancer. After informed consent was obtained, 20 patients with stage IV, end-stage cancer were evaluated (one bladder, five breast, two prostate, one neuroblastoma, two non-small cell lung, three colon, 1 mesothelioma, two lymphoma, one ovarian, one gastric, one osteosarcoma). Transfer Factor Plus (TFP+, 3 tablets 3 times per day), IMUPlus (non denatured milk whey protein, 40 gm/day); Intravenous (50 to 100 gm/day) and oral (1-2 gm/day) ascorbic acid; Agaricus Blazeii Murill teas (10 gm/day); Immune Modulator Mix (a combination of vitamin, minerals, antioxidants and immune-enhancing natural products); nitrogenated soy extract (high levels of genistein and dadzein) and Andrographis Paniculata (500 mg twice, daily) were used. Baseline NK function by standard 4 h 51Cr release assay and TNF alpha and receptor levels were measured by ELISA from resting and phytohemagglutinin (PHA) stimulated adherent and non-adherent Peripheral Blood Mononuclear Cell (PBMC). Total mercaptans and glutathione in plasma were taken and compared to levels measured 6 months later. Complete blood counts and chemistry panels were routinely monitored. As of a mean of 6 months, 16/20 patients were still alive. The 16 survivors had significantly higher NK function than baseline (p < .01 for each) and TNF-alpha levels in all four cell populations studied (p < .01 for each). Total mercaptans (p < .01) and TNF-alpha receptor levels were significantly reduced (p < .01). It was also observed that hemoglobin, hematocrit and glutathione levels were significantly elevated. The only toxicity noted was occasional diarrhea and nausea. The quality of life improved for all survivors by SF-36 form evaluation. An aggressive combination of immunoactive Nutraceuticals was effective in significantly increasing NK function, other immune parameters and hemoglobin from PBMC or plasma in patients with late stage cancers. Nutraceutical combinations may be effective in late stage cancers. Clinical outcomes evaluations are ongoing.

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**Fuente:**