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PB2155 TARGETING NEUROBIOLOGICAL MECHANISMS IN PATIENTS WITH MULTIPLE MYELOMA HAS IMPROVED THEIR PLASMACYTOID DENDRITIC CELLS CD123+, B LYMPHOCYTE MEMORY CELLS CD27+, VAGAL ACTIVITY AND DISTRESS.

Topic: 14. Myeloma and other monoclonal gammopathies - Clinical

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Background:

The sympathetic nervous system (NS), when increasingly activated by chronic stress, stimulates the growth of myeloma (MM) cells by noradrenalin binding to β1 and β2 adrenergic receptors (βAR) on their surface and consequently induces the production of VEGF (vascular endothelial growth factor) that supports further proliferation and expansion of the tumour.

Beta blockers have a protective effect in patients with MM and prolong their overall survival by decreasing glycolytic activity in MM cells via blocking of βAR.

MM causes the highest level of distress for patients in comparison with other common cancer types.

A significant proportion of patients with MM reported a specific distress caused by anger and resentment. These factors generate intensive sympathetic activity contributing to further progression of MM and suppression of their immune system.

Patients with MM in long term remission have the unique immune profile signature consistent with functional immune surveillance.

Aims:

Targeting the primary and secondary distress in patients with MM can reduce the pathological adrenergic activity, improve immune profile, quality of life (QoL) and overall survival

Methods:

The authors conducted the multi-centric pilot clinical trial with a control and interventional arms: Patients (n=12) with MM (n=10) and MGUS (n=2) on immuno chemotherapy or clinical observation were screened for a specific distress factor (repressed toxic anger).

8 who screened positive (7 females, 1 male) were recruited to the interventional arm, and 4 who were negative (2 females, males) into the control arm.

The following parameters were measured before and after the intervention:

• quantification of immune cells in peripheral blood by flowcytometry,

• activity of sympathetic and parasympathetic NS by HRV (heart rate variability)

• the level of depression, anger and anxiety by the validated questionnaire PROMIS.

The intervention which targeted the specific distress was Forgiveness Therapy, viewed as an empirically-verified mental health approach by the American Psychological Association; the efficiency of it was measured by validated inventories of forgiveness, the EFI30 and ESFI30.

Results:

The measured parameters in the interventional arm when compared with the control one showed:

• improved levels of healthy plasma cells CD138+CD38+ (p=0.05); improved plasmacytoid dendritic cells CD123+ (p=0.03) and B lymphocyte memory cells CD27+ (p=0.025)

• improved vagal activity measured by PNS, SDNN, RMDSS and reduced high sympathetic activity (SNS and stress index)

• common parameters of distress (depression, anger, and anxiety) measured by PROMIS were improved above average based on the PROMIS norms.

Summary/Conclusion:

Myeloma cells communicate with nervous systems to receive their support in malignant proliferation and shielding from immune surveillance.

Targeting these interactions by a specific intervention such as Forgiveness Therapy, which reduces unhealthy anger, alongside standard immuno-chemotherapy can improve autonomic nervous system balance and parameters of patients' immune system, and their wellbeing.

Further research is warranted in the psycho-neuro-immunology and neurobiology of multiple myeloma based on our pilot trial.