

ADDRESSING THE DISTRESS OF PATIENTS WITH MULTIPLE MYELOMA CAM IMPROVE THEIR QUALITY OF LIFE, PARAMETERS OF THEIR IMMUNE PROFILE AND AUTONOMIC NERVOUS SYSTEM

[1,2]Pavel Peter Kotoucek, [3,4]Jan Sedlak, [5]Veronika Chlebcova, [3]Dana Cholujova, [5]Stanislava Gregor Sorgerova, [6]Luba Hunakova, [3]Jana Jakubikova, [7,8]Boris Mravec, [5]Eva Nanistova, [5]Ludmila Panekova, [9,10] Robert Enright

1 Haematology Department, Broomfield Hospital, MSE NHS FT, Chelmsford, ENGLAND, 2 School of Medicine, Anglia Ruskin University, Chelmsford, ENGLAND, 3 Cancer Research Institute, Cancer Immunology, Slovak Academy of Sciences, Bratislava, SLOVAKIA, 4 Nadácia Výskum Rakoviny, Bratislava, SLOVAKIA, 5 Fakulty of Psychology, Pan-European University, Bratislava, SLOVAKIA, 6 Institute of Immunology, School of Medicine, Comenius University, Bratislava, SLOVAKIA, 7 Institute of Physiology, School of Medicine, Comenius University, Bratislava, SLOVAKIA, 8 Institute of Experimental Endocrinology, Slovak Academy of Sciences, Bratislava, SLOVAKIA, 9 Department of Educational Psychology, University Wisconsin-Madison, Madison, USA, 10 International Forgiveness Institute, Madison, Wisconsin, USA.

CONTEXT

Multiple myeloma causes the highest distress to patients compared to other cancers. Identifying its causes and targeting it by efficient therapies may improve quality of life and somatic parameters. Repressed chronic anger contributes to this distress.

OBJECTIVES

Can targeting chronic anger by Forgiveness Therapy during standard treatment improve the parameters of immune profile, autonomous nervous system, quality of life and overall survival?

DESIGN

The multi-center pilot study with interventional and control arms. The intervention was Forgiveness Therapy, defined by Dr. Enright, an empirically-verified mental health approach, supported by the American Psychological Association. The measured parameters before and after the intervention:

1. the efficiency of Forgiveness Therapy was measured by the validated inventory of forgiveness, the EFI-30.
2. immune profiling of peripheral blood by flowcytometry.
3. autonomic nervous system by 24-hour heart rate variability.
4. quality of life by PROMIS (anger, anxiety, depression).
5. disease by paraprotein and serum free light chains.

THE PANELS OF ANTIBODIES USED IN FLOWCYTOMETRY

PANEL 1

T, B Ly PANEL

CCR7	BV421	Brilliant Violet 421™ anti-human CD197 (CCR7) Antibody
CD8	BV510	Brilliant Violet 510™ anti-human CD8 Antibody
IgD	BV605	Brilliant Violet 605™ anti-human IgD Antibody
CD20	BV650	CD20 - Brilliant Violet 650™ anti-human CD20 Antibody
CD45RA	BV711	Brilliant Violet 711™ anti-human CD45RA Antibody
CD4	BV785	Brilliant Violet 785™ anti-human CD4 Antibody
CD138	FITC	FITC anti-human CD138 (Syndecan-1) Antibody
PD1	PE	PE anti-human CD279 (PD-1) Antibody
CD19	PerCP/Cyanine5.5	PerCP/Cyanine5.5 anti-human CD19 Antibody
CD38	PECy7	PE/Cyanine7 anti-mouse CD38 Antibody
CD3	APC	APC anti-human CD3 Antibody
CD27	APC-Cy7	APC/Cyanine7 anti-human CD27 Antibody

PANEL 2

NK, DC, Mo PANEL

CD5	APC	APC anti-human CD5 Antibody
CD19	APC	APC anti-human CD19 Antibody
CD20	APC	APC anti-human CD20 Antibody
CD16	BV421	Brilliant Violet 421™ anti-human CD16 Antibody
CD123	BV510	Brilliant Violet 510™ anti-human CD123 Antibody
CD27	BV605	Brilliant Violet 605™ anti-human CD27 Recombinant Antibody
CD11c	BV711	Brilliant Violet 711™ anti-human CD11c Antibody
CD56	FITC	FITC anti-human CD56 (NCAM) Antibody
HLA.DR	PE	PE anti-human HLA-DR Antibody
CD14	PECy7	PE/Cyanine7 anti-human CD14 Antibody

PANEL 3

T reg bunky PANEL

CD25	BV421	Brilliant Violet 421™ anti-human CD25 Antibody
CD127	BV605	Brilliant Violet 605™ anti-human CD127 (IL-7Rα) Antibody
CD45RA	BV711	Brilliant Violet 711™ anti-human CD45RA Antibody
HLA.DR	FITC	FITC anti-human HLA-DR Antibody
PD1	PE	PE anti-human CD279 (PD-1) Antibody
CCR4	PerCP/Cy5.	PerCP/Cyanine5.5 anti-mouse CD194 (CCR4) Antibody
CD3	APC	APC anti-human CD3 Antibody
CD4	BV785	Brilliant Violet 785™ anti-human CD4 Antibody

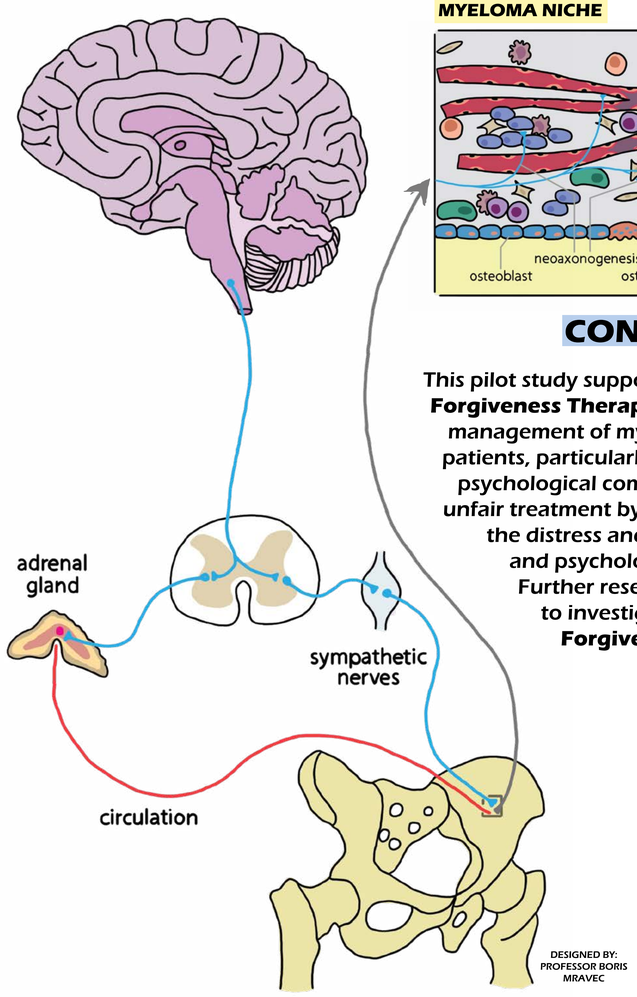








Forgiveness Therapy is the official intervention of the American Psychological Association



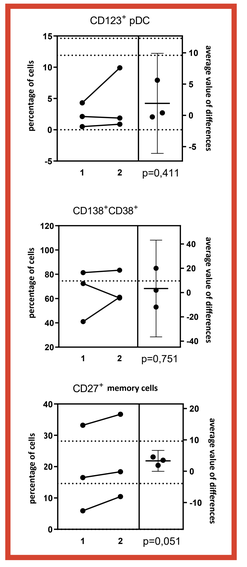
DESIGNED BY: PROFESSOR BORIS MRAVEC

MYELOMA NICHE

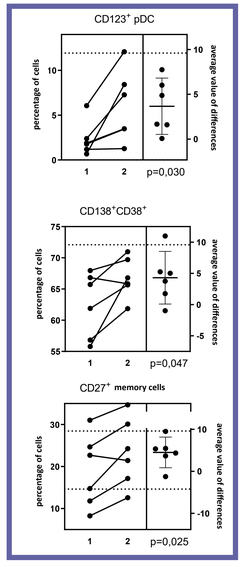
CONCLUSIONS:

This pilot study supports implementing **Forgiveness Therapy** into integrative management of myeloma for certain patients, particularly those who have psychological compromise from the unfair treatment by others, to reduce the distress and improve somatic and psychological parameters. Further research is warranted to investigate the impact of **Forgiveness Therapy** on overall survival.

CONTROL ARM



INTERVENTIONAL ARM

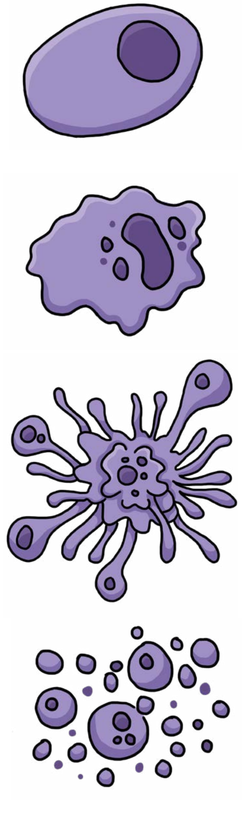


RESULTS:

Twelve participants were screened for a specific distress factor - repressed chronic anger. Eight who screened positive (7 females, 1 male) were in the interventional arm, and four who were negative (2 females, 2 males) in the control arm. Participants in the interventional arm achieved:

1. a significant resolution of anger: EFI- 30 has improved from 54 (average) to 129 (average); values of 105 points and below are consistent with the significant level of anger and resentment.
2. improvement in the immune profile of physiological plasma cells CD138+CD38+ (p=0.047); plasmacytoid dendritic cells CD123+ (p=0.03) and B lymphocyte memory cells CD27+ (p=0.025).
3. improved parameters of stress and vagal activity PNS, SDNN, RMDSS (not statistically significant).
4. improved PROMIS for anger, anxiety, depression - average score improved from 50.7 to 42, from 59 to 47, from 53 to 46, respectively.
5. ongoing remission of disease.

THE PROCESS OF APOPTOSIS OF A MYELOMA CELL



CONTACT INFORMATION:
pavel.kotoucek@nhs.net

ILLUSTRATOR: ANNA KOTOUCKOVA
INSTAGRAM: Strawberry_Froggers