

Predicting Stress Levels and Response to a Self-Management Program Using Participant Demographic, Clinical, and Biomarker Data: A Secondary Analysis



Nico Osier^{1 2}, Alexa Stuijbergen¹, Sawyer Stubbs^{2 3}, Tapasvini Paralkar^{1 2 3 4}

(1) School of Nursing, UT Austin; (2) Department of Neurology, Dell Medical School ; (3) College of Natural Sciences, UT Austin; (4) College of Liberal Arts, UT Austin



BACKGROUND

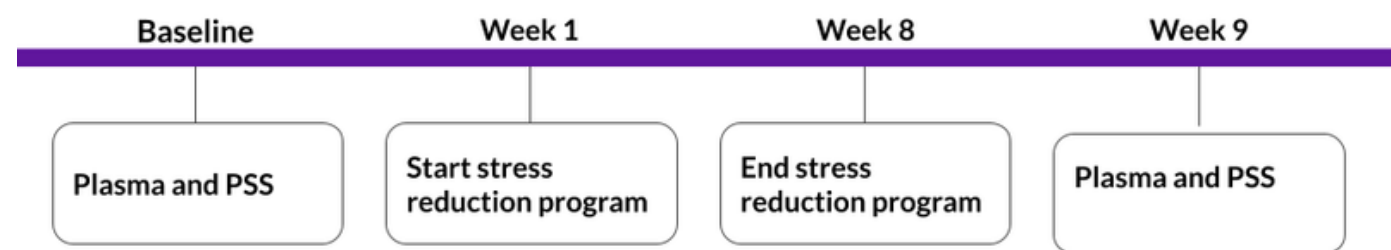
- Stress is thought to exacerbate multiple sclerosis (MS)
- Stress management interventions are being pursued for persons with MS
- Self-report bias impacts the ability to evaluate stress management programs
- Biomarkers for predicting stress intervention response are needed

OBJECTIVE

- To evaluate relationships between biomarkers and stress in persons with MS

METHODS

- Institutional Review Board (IRB) approval was obtained prior to the study
- A parent study (PWW-MS) was used as the source of the participants (PI: Stuijbergen)
- Perceived Stress Scale (PSS) was used to assess stress
- n=14 women (54 +/- 9.65 years) were enrolled



- Google Sheets, R, and Python were used to clean and analyze data
- Spearman's rank-order correlations were used to test for collinearity ($Rho \geq 0.8$)
- Multiple and logistic regressions were planned to:
 - (1) associate biomarkers with T1 and T2 PSS
 - (2) use biomarkers to predict reduction in PSS
- Regression assumptions were not met, even with logarithmic transformation
 - Thus, correlation analysis was used to address the research questions

RESULTS

Association Between Biomarkers and Perceived Stress at each time point

Biomarker	Correlation Coefficient (r) (T1, T2)	p value (T1, T2)
IL-1Ra	-0.602, 0.0867	0.0502* , 0.800
IL-6	-0.240, -0.266	0.478, 0.430
Cortisol	-0.0257, -0.560	0.940, 0.0735*
Melatonin	0.166, -0.280	0.625, 0.403

*Trending toward significance with a p-value between 0.05 and 0.10

RESULTS SUMMARY

- Biomarkers were not correlated with T1 PSS, T2 PSS, or improved PSS
- IL-1ra was moderately negatively correlated with T1 PSS
- Cortisol was moderately negatively correlated with T2 PSS
- Other results were omitted due to lack of significance

CONCLUSION

- This pilot study was underpowered to detect statistically significant relationships
- Possible confounders include: comorbidities, changes in medication, response bias
- Follow up studies in larger samples should be conducted

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