



Thinner medial orbital frontal cortex is associated with early PTSD symptoms, sleep disturbance, and mental health problems that may contribute to PTSD development after acute trauma



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Abstract

This study examined relationships between the medial orbital frontal cortex (mOFC) thickness 2 weeks after trauma and such symptoms over 2 weeks to 3 months after trauma. Trauma survivors with PTSD (n=46) had more severe sleep and mental health problems at 3 months (P<0.001 and P=0.017, respectively) compared to non-PTSD (n=68) survivors. The left mOFC thickness at 2 weeks in PTSD subjects was negatively correlated with PCL-5 scores (r=-0.381, p=0.020) at 2 weeks and PSQI scores at 3 months (r=-0.372, p=0.020), and positively correlated with SF-12 mental health scores (r=0.335, p=0.03) at 2 weeks. Therefore, thinner mOFC appears to be associated with more serious acute PTSD and mental health symptoms in the early days after trauma and may predict sleep disturbance over subsequent early posttrauma months in PTSD survivors.

Introduction & Methods

Both thinner mOFC and an association between sleep disturbance and smaller mOFC volume have both been reported in chronic PTSD patients. However, the relationship between mOFC structure and symptoms of PTSD, sleep disturbance, and other mental health problems has not been studied in the early days to months after trauma.

We examined relationships between mOFC thickness 2 weeks after trauma and such symptoms over 2 weeks to 3 months after trauma. We conducted structural MRI scans 2 weeks after trauma. mOFC thickness was measured using FreeSurfer software. PTSD Checklist (PCL-5), Pittsburgh Sleep Quality Index (PSQI), and mental health (SF-12 Health Survey) were acquired at 2 weeks and 3 months. PTSD was diagnosed at 3 months. Symptom severity differences comparing PTSD and non-PTSD groups and relationships between mOFC thickness and symptom severity were assessed.

Preliminary Results

Trauma survivors diagnosed with PTSD (n=46) had more severe sleep and mental health problems at 3 months (P<0.001 and P=0.017, respectively) compared to non-PTSD (n=68) survivors. In PTSD, but not non-PTSD, survivors, left mOFC thickness at 2 weeks was negatively correlated with PCL-5 scores (r=-0.381, p=0.020) at 2 weeks and PSQI scores at 3 months (r=-0.372, p=0.020), and positively correlated with SF-12 mental health scores (r=0.335, p=0.03) at 2 weeks.

	PTSD (mean±SD)	nonPTSD (mean±SD)	T score	P
PCL-5 2w	57.05±12.69	45.41±18.04	-3.87	0
PCL-5 3m	49.73±16.15	28.27±17.99	-6.426	0
PSQI 2w	11.1±4.12	9.13±5.75	-2.041	0.044
PSQI 3m	10.14±5.51	6.27±5.35	-3.525	0.001
SF-12 2w	29.58±12.33	34.91±9.35	2.467	0.016
SF-12 3m	33.97±11.36	40.86±11.30	3.068	0.003

Table 1: PCL-5, PSQI, and SF-12 scores at 2 weeks and 3 months for PTSD and non-PTSD patients. All P values <0.05.

lmOFC (PTSD) vs.	R (Correlation)	p (Significance, 2-tailed)	df
PCL-5 2w (PTSD)	-0.381	0.02	35
PSQI 3m (PTSD)	-0.372	0.02	37
SF-12 2w (PTSD)	0.335	0.03	40

Table 2: Correlation between the left mOFC thickness and PCL-5 scores at 2 weeks, PSQI score at 3 months, and SF-12 scores at 2 weeks among PTSD patients.

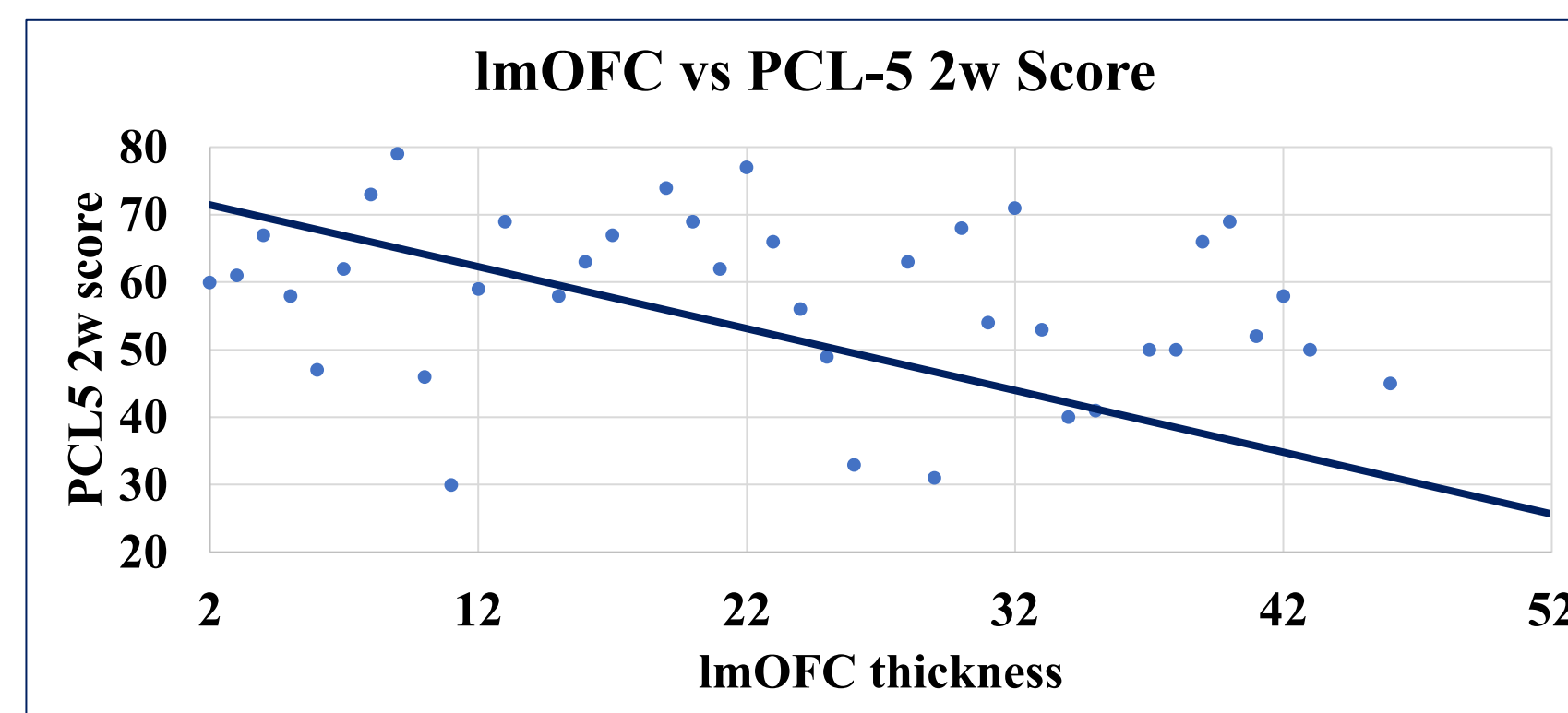


Figure 1: Correlation between the left mOFC thickness and PCL-5 scores at 2 weeks among PTSD patients. (R=-0.381, P=0.02)

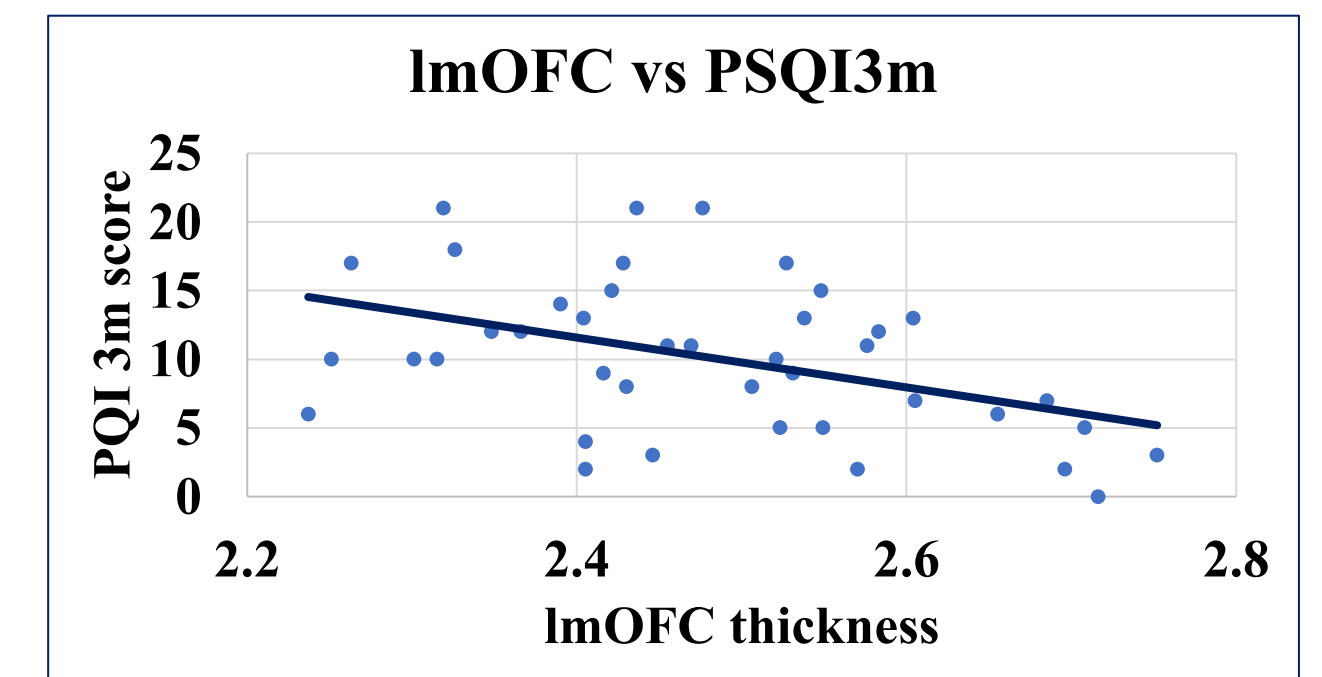


Figure 3: Correlation between the left mOFC thickness and PSQI scores at 3 months among PTSD patients. (R=-0.372, P=0.02)

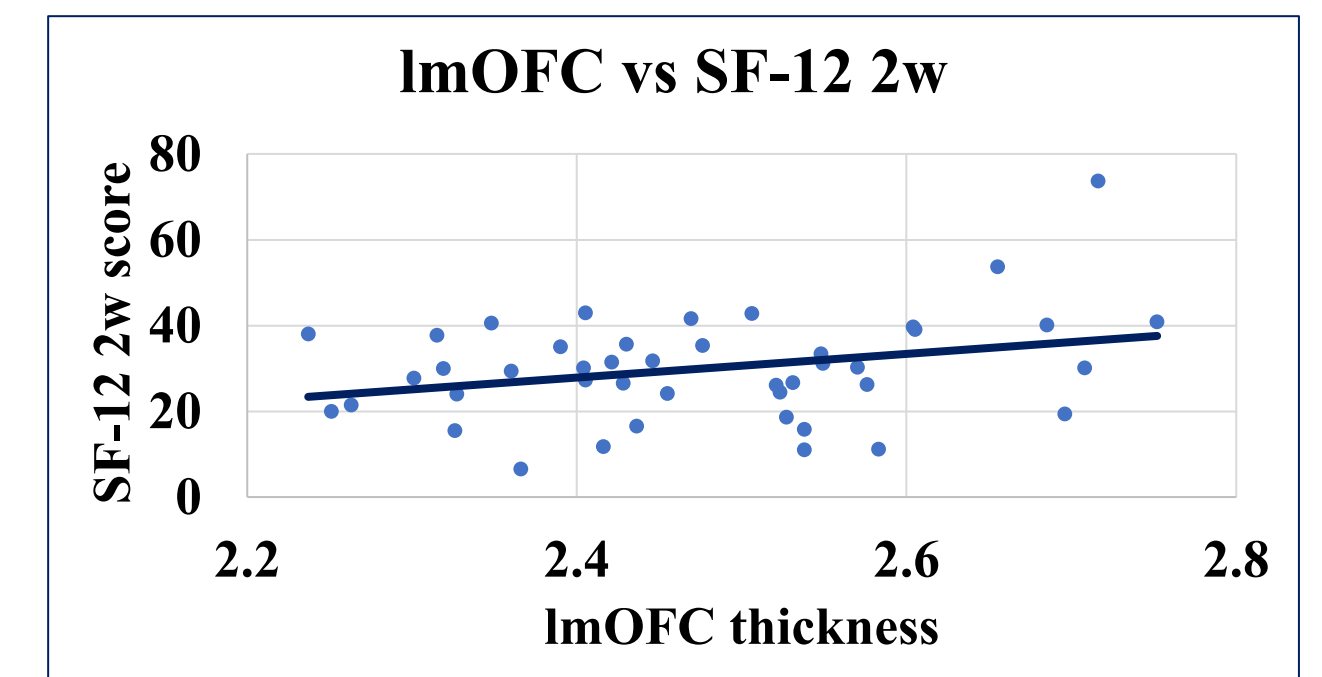


Figure 4: Correlation between the left mOFC thickness and SF-12 scores at 2 weeks among PTSD patients. (R=0.335, P=0.03).

Conclusions

The findings suggest that within early days after trauma, thinner left mOFC appears to be associated with more serious acute PTSD and mental health symptoms and may predict sleep disturbance over subsequent early posttrauma months in PTSD survivors.

Future Directions

We aim to continue including subjects in this study to confirm the relationships determined in this study and solidify the results.



THE HUMANITY FIRST RESEARCH SYMPOSIUM

Abstract Submission

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Trauma survivors diagnosed with PTSD (n=46) had more severe sleep and mental health problems at 3 months ($P < 0.001$ and $P = 0.017$, respectively) compared to non-PTSD (n=68) survivors. In PTSD, but not non-PTSD, survivors, left mOFC thickness at 2 weeks was negatively correlated with PCL-5 scores ($r = -0.381$, $p = 0.020$) at 2 weeks and PSQI scores at 3 months ($r = -0.372$, $p = 0.020$), and positively correlated with SF-12 mental health scores ($r = 0.335$, $p = 0.03$) at 2 weeks. The findings suggest that within early days after trauma, thinner mOFC appears to be associated with more serious acute PTSD and mental health symptoms and may predict sleep disturbance over subsequent early posttrauma months in PTSD survivors.