Somatic symptom disorder linked to changes in brain functional connectivity

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Alterations in functional connectivity of the brain may help in understanding the neurobiological changes leading to somatic symptom disorder (SSD), reports a study in *Psychosomatic Medicine: Journal of Biobehavioral Medicine*, the official journal of the American Psychosomatic Society.

The new research by Doug Hyun Han, MD, Ph.D., and colleagues of Chung-Ang University, Republic of Korea, provides a deeper understanding of how connectivity within and between brain networks may differ in people with SSD, compared to healthy controls. The findings may help in understanding what's going on in the brains of patients with disabling anxiety and distress related to physical symptoms.

New Insights into Functional Connections of the Brain in People with SSD

Patients with SSD have persistent worry about bodily symptoms that are misinterpreted as medical diseases. The study included 18 patients with SSD and 20 healthy controls: 13 women and five men, average age 47 years. Seven were classified as having the "predominant pain" subtype of SSD.

Using a technique called functional magnetic resonance imaging (fMRI), the researchers assessed functional connectivity—interactions and synchronized activity—between different areas of the brain in SSD

patients versus controls. The fMRI data were analyzed to explore connections within and between four previously defined "brain networks" with specialized functions. Within three of the four brain networks studied, functional connectivity was greater in the patients with SSD, compared to the healthy controls.

The study also found increased functional connectivity between certain brain networks in patients with SSD. Scores on a widely used SSD questionnaire (the Somato-Sensory Amplification Scale) were correlated with the level of functional connectivity between some of the networks.

Specifically, SSD was related to functional connections between the sensorimotor network (SMN), involved in processing somatosensory information and planning motor tasks (movement); and the salience network, involved in detecting and integrating emotional and sensory stimuli. Based on this interaction, SSD may be related to changes in the sensory processing of pain and other symptoms, which is influenced by emotional (affective) processing. Patients with SSD may also have "magnified labeling of pain intensity" and increased attention to the "affective or unpleasant component of physical pain," according to the authors.

Scores on the SSD questionnaire were also related to functional connectivity between the SMN and the dorsal attention network, which is involved in goal-directed and stimulus-driven attention. Based on this connection, Dr. Han and coauthors write, "[P]atients with SSD have a deficit in attention, leading to misperception of external stimuli and failure to regulate bodily functions aimed at interactions with external stimuli."

Somatic symptom disorder is a common condition, affecting an estimated five to seven percent of the population. People with SSD have high rates of depression and anxiety and poor quality of life, with

frequent medical visits and high healthcare costs. Despite progress in research on SSD, there are no established biomarkers of this condition.

Building on previous studies, the new findings show increased functional connections within and between certain brain networks in people living with SSD. These differences in brain functional connectivity may lend new insights into the underlying neurobiology of this condition. Dr. Han and colleagues highlight the need for further studies including larger numbers of people with SSD, including assessment of possible differences by sex and comparison with patients with physical disease who have similar levels and types of symptoms.

More information: Sun Mi Kim et al. Brain Functional Connectivity in Patients With Somatic Symptom Disorder, *Psychosomatic Medicine* (2019). DOI: 10.1097/PSY.0000000000000681

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