Fatty acids in context

Neurometabolic perspectives on depression vulnerability

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Introduction to emotional processing

A disturbed balance between negative and positive valence systems seems to lie at the heart of MDD symptomatology. For example, regarding negative valence systems, MDD-patients suffer from negative affect, rumination and dysfunctional cognitions. This disturbed balance between negative and positive valence systems at the symptom level may relate to negative biases in emotional processing at the affective (‘hot’) neuropsychological level. Negative biases manifest themselves when (dis)engaging (i.e. attentional bias), memorizing, error-monitoring, shifting attention between or regulating emotional information.

Negative biases in emotional processing are thought to result from increased negative attention on the self, and are thus related with negative self-referential processing styles as rumination and cognitive reactivity, which show a reciprocally reinforcing relationship with negative affect. Increasing evidence shows that negative self-referential processing contribute greatly to the course and development of MDD.

Technological advances during the last decades have facilitated in vivo assessment of brain structure and activity. This fueled studies investigating theories on brain alterations in psychiatric disorders as MDD. From a neurobiological perspective, disturbed emotional processing at the affective neuropsychological level may be observed as an imbalance between emotional (limbic/ventral) and regulating (cognitive/dorsal) regions. Despite international efforts to pool datasets, only small (~1%) - albeit relatively widespread - volume reductions of these limbic and cognitive areas could be found. Functional analysis of brain activity seems to be able to delineate larger alterations in MDD. For example, emotional processing brain regions including the amygdala seem hyperactive in response to negative stimuli but hypoactive to positive. In addition, regulating regions are generally hypoactive but may show compensatory hyperactivity under certain circumstances, for example, more automatic emotion regulation. This may be explained by altered functional and structural connectivity between these regions.

Here, we describe our transdiagnostic research on differences in brain activity during emotion regulation between unmedicated depressed and remitted patients with unipolar depression (MDD) or bipolar disorder and healthy controls.