What happens when we get angry?

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What happens when we get angry? Credit: SINC

When we get angry, the heart rate, arterial tension and testosterone production increases, cortisol (the stress hormone) decreases, and the left hemisphere of the brain becomes more stimulated. This is indicated by a new investigation lead by scientists from the University of Valencia (UV) that analyses the changes in the brain's cardiovascular, hormonal and asymmetric activation response when we get angry.

"Inducing emotions generates profound changes in the autonomous nervous system, which controls the cardiovascular response, and also in the endocrine system. In addition, changes in cerebral activity also occur, especially in the frontal and temporal lobes", Neus Herrero, main author of the study and researcher at UV, explains to SINC.

The researchers induced anger in 30 men using the version that has been

adapted to Spanish of the procedure "Anger Induction" (AI), consisting of 50 phrases in first person that reflect daily situations that provoke anger. Before and immediately after the inducement of anger they measured the heart rate and arterial tension, the levels of testosterone and cortisol, and the asymmetric activation of the brain (using the dichotic listening technique), the general state of mind and the subjective experience of the anger emotion.

The results, published in the journal Hormones and Behavior, reveal that anger provokes profound changes in the state of mind of the subjects ("they felt angered and had a more negative state of mind") and in different psychobiological parameters. There is an increase in heart rate, arterial tension and testosterone, but the cortisol level decreases.

Asymmetries of brain activity

Nonetheless, "by focusing on the asymmetric brain activity of the frontal lobe that occurs when we experience emotions, there are two models that contradict the case of anger", the researcher highlights.

The first model, 'of emotional valence', suggests that the left frontal region of the brain is involved in experiencing positive emotions, whilst the right is more related to negative emotions.

The second model, 'of motivational direction', shows that the left frontal region is involved in experiencing emotions related to closeness, whilst the right is associated with the emotions that provoke withdrawal.

The positive emotions, like happiness, are usually associated to a motivation of closeness, and the negative ones, like fear and sadness, are characterised by a motivation of withdrawal.

However, not all emotions behave in accordance with this connection.

"The case of anger is unique because it is experienced as negative but, often, it evokes a motivation of closeness", the expert explains.

"When experiencing anger, we have observed in our study an increase in right ear advantage, that indicates a greater activation of the left hemisphere, which supports the model of motivational direction", Herrero points out.. In other words, when we get angry, our asymmetric cerebral response is measured by the motivation of closeness to the stimulus that causes us to be angry and not so much by the fact we consider this stimulus as negative: "Normally when we get angry we show a natural tendency to get closer to what made us angry to try to eliminate it", he concludes.

Every emotion is unique

This is the first general study on emotions and more specifically on anger that examines all these different psychobiological parameters (cardiovascular, hormonal response and asymmetric activation response of the brain) in a single investigation to study the changes caused by the inducement of anger. In addition the results of the study are along the same lines as previous investigations and defend what has been noted by Darwin: that the emotions, in this case anger, are accompanied by unique and specific (psychobiological) patterns for each emotion.

More information: Neus Herrero, Marien Gadea, Gabriel Rodríguez-Alarcón, Raúl Espert, Alicia Salvador. “What happens when we get angry? Hormonal, cardiovascular and asymmetrical brain responses”. Hormones and Behavior 57: 276-283, marzo de 2010. DOI:10.1016/j.yhbeh.2009.12.008

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