

Cortisol, Prolactin, Growth Hormone and Neurovegetative Responses to Emotions Elicited During an Hypnoidal State

Results:

The purpose of our study was to provide answers to the following questions:

- 1) Do sessions of psychotherapy with an emotional content have more hormonal surges than relaxation-only, sessions?
- 2) Are surges of different hormones associated?
- 3) Are hormonal responses related to the intensity, type, or mode of expression of the emotions?

Methods: Thirteen volunteers and 12 patients with minor emotional difficulties were studied under hypnosis. There were two types of sessions - "blank and "free associations" (FA).

Results: Sessions of FA had more hormonal surges than "blank". This was true for cortisol (8/17 v.3/24; $p < 0.03$), prolactin (PRL) (7/17 v. 3/24; $p < 0.05$) and growth hormone (GH) (9/17 v. 4/24; $p < 0.02$). During the 55 sessions of FA there were 32 surges of cortisol, 18 of PRL and 28 of GH. Cortisol and PRL surges were negatively correlated ($p < 0.03$). GH was not associated with either cortisol or PRL. Intense emotions were associated with GH surges ($p < 0.05$). but not with cortisol or PRL. Cortisol surges were correlated positively with evocations of real events ($p < 0.01$) and with the unexpected re-enacting of long-forgotten traumatic experiences ($p < 0.02$). PRL correlated with memories of humiliating experiences ($p < 0.07$).

Conclusions: Cortisol, PRL and GH respond to psychological stress in humans. Cortisol and PRL surges are alternative responses to specific emotions. Neither relates to the intensity of the evoked emotion. Cortisol surges occur when a connection between the emotion and its cognitive component is established. Prolactin surges may be adaptive to unavoidable suffering. GH surges depend on the intensity of the emotion, probably as a consequence of the associated muscular activity.

Published Work:

Full articles:

Sobrinho LG, Simões M, Raposo JF, Barbosa L (1999) Respostas hormonais e neurovegetativas durante estados modificados de consciência. *Revista Portuguesa de Psicossomática* 1; 53-62.

Sobrinho LG, Simões M, Barbosa L, Raposo JF, Fernandes P, Pratas S (2000) Alterações hormonais e neurofisiológicas durante vivências induzidas em estados modificados de consciência. *Aquém e Além do Cérebro - 3º Simpósio da Fundação BIAL*, Ed. Fundação BIAL, pgs 209 - 230.

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Sobrinho LG, Simões M, Barbosa L, Raposo JF, Pratas S, Fernandes PL, Santos MA (2003) Cortisol, prolactin and growth hormone responses to emotions elicited during an hypnoidal state. *Psychoneuroendocrinology*, vol 28; pgs 1-17.

Abstracts:

Sobrinho LG, Simões M, Raposo J - Respostas hormonais e neurovegetativas durante estados modificados de consciência.

Raposo JF, Sobrinho LG - Avaliação neurovegetativa em endocrinologia.

(Communications presented at the Meeting of the Sociedade Portuguesa de Endocrinologia, Diabetes e Metabolismo, Viana do Castelo 23-25 January 1998 and published in *Endocrinologia, Metabolismo e Nutrição*, vol.7, 1998).

Sobrinho LG, Simões M, Barbosa L, Raposo JF, Pratas S, Fernandes PL, Santos MA - Cortisol, prolactin and GH responses in humans during emotions elicited during an altered state of consciousness.

(Presented at the Meeting of the Sociedade Portuguesa de Endocrinologia, Diabetes e Metabolismo, Porto 23-25 January 2001 and published in *Endocrinologia, Metabolismo e Nutrição*, vol.10, 2000).

Sobrinho LG, Simões M, Barbosa L, Raposo JF, Pratas S, Fernandes PL, Santos MA - Cortisol, prolactin and GH responses to emotions elicited during an hypnoidal state. (Presented at the 5th European Congress of Endocrinology, Turim, June, 2001 and published in its Abstract Book).

Sobrinho LG, Simões M, Barbosa L, Raposo JF, Pratas S, Fernandes PL, Santos MA (2002) Hormonal responses to emotions elicited during a hypnoidal state. (Presented at the 24th European Conference of Psychosomatic Research, June, Lisboa, Portugal and published in *J Psychosomatic Res* 52; 341-2.).

Sobrinho LG, Simões M, Barbosa L, Raposo JF, Pratas S, Fernandes PL, Santos MA (2002) Hormonal responses to emotions elicited during a hypnoidal state. (Presented at the 10th Meeting of the European NeuroEndocrine association, ENEA, Munich, September, 2002 and published in its Abstract Book)..

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