OXYTOCIN AND CORTISOL IN THE HYPNOTIC INTERACTION

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Abstract: Changes in oxytocin and cortisol levels were tested in healthy volunteers during hypnotic interactions in standardized laboratory sessions. Pre- to posthypnosis changes of oxytocin and cortisol were related to the hypnotic susceptibility of subjects and the relational experiences reposted by subjects and hypnotists on several paper-and-pencil tests. Results show that the changes in oxytocin are not related to hypnotic susceptibility but to relational experiences. After the hypnotic interaction, the subject’s oxytocin level increased if perceived harmony with the hypnotist was high, whereas it increased in the hypnotist if the subject had memories of less warm emotional relationships with his or her parents. The results are interpreted within the social-psychobiological model of hypnosis.

The effect of oxytocin on the central nervous system has become a subject of scientific analysis in recent years (Kendrick, 2000; Ludwig & Leng, 2006; Sabatier, Rowe, & Leng, 2007). Oxytocin acts as a neurotransmitter; a neuromodulator in the brain regulates social affiliation (for a summary, see Insel, 1992; Leng & Ludwig, 2008).

Several psycho-emotive functions of oxytocin have been described. Oxytocin regulates affective, social processes, reduces anxiety and fear (Huber, Veinante, & Stoop, 2005), decreases depression (Uvnäs-Moberg, Bjokstrand, Hillegaart, & Ahlenius, 1999), reduces antisocial behavior, promotes both provision and acceptance of social support (Grewen, Girdler, Amico, & Light, 2005), increases trust and strengthens social behavior (Damasio, 2005; Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005; Zak & Fakhar, 2006).

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As opposed to the fight-or-flight response, the oxytocin-based stress management system is activated mainly in the medium of social support. Individuals face stress calmly and in the proximity of each other. This method of stress management is called calm and connection. It is supposed that this could be the “feminine type” of stress management of mothers and their small children in the time of our early ancestors—as opposed to the masculine type of fight-or-flight response of men (DeVries, Glasper, & Detillion, 2003; Uvnäs-Moberg, Arn, & Magnusson, 2005).

The oxytocin system is connected to the dopamine system. The estrogen-sensitive oxytocin neurons of the medial preoptic area (MPOA) are projected directly to the ventral tegmental area. The dopamine level in the nucleus accumbens (a part of the mesolimbic dopamine system) increases in the course of caring for the offspring (Cameron et al., 2008). Oxytocin and dopamine also control important reward systems, thus, they play a role in experiencing the pleasure of performing parenting tasks (Esch & Stefano, 2005).

Epigenetic transgenerational animal studies show that the fate of offspring is not determined by their genetic heritage but by the quality of their postpartum maternal care (for a summary, see Champagne, 2008; Champagne & Curley, 2009). The quality of maternal care also determines the stress reactivity of the offspring (Fish et al., 2004; Weaver et al., 2004).

Oxytocin studies in humans have greatly accumulated over the past few years, in connection with different social situations and effects. Weisman, Zagoory-Sharon, and Feldman (2012) reported more than 70 studies where the favorable social and psycho-emotive effects of oxytocin were recorded in healthy persons or in different clinical samples. Research shows increased trust, more sensitive interactions, decreased social fear, and improved social skills.

**Hypnosis and the Oxytocin System**

For hypnosis—a special social situation—to work well, participants in a hypnotic interaction must have not only a trusting atmosphere but must also tolerate intense social stimuli. When the optimal context is set, a positive and rewarding experience is reported.

As we discussed above, the oxytocin level is closely related to the dopamine system, which is a central element in the neurobiology of social relationships (Esch & Stefano, 2005). Just as in one of our earlier studies (Szekely et al., 2010), several other investigations described the association between hypnotizability and catechol-O-methyltransferase (COMT) the dopamine-degrading enzyme (see Lichtenberg, Bachner-Melman, Ebstein, & Crawford, 2004; Lichtenberg, Bachner-Melman, Gritsenko, & Ebstein, 2000; Raz, 2005; Raz, Fan, & Posner, 2006).
Australian researchers found that intranasally administered oxytocin increased the hypnotic responsiveness of subjects originally low in hypnotizability more than the placebo control did (Bryant, Hung, Guastella, & Mitchell, 2012). According to their interpretation, oxytocin shifted the relationship with the hypnotist—that is, rapport—in a more favorable direction, but no direct proof of this was reported.

Although researchers have already investigated the interaction of hypnosis and the hypothalamic–pituitary–adrenal (HPA) axis (Sobrinho et al., 2003; Wood, Bughi, Morrison, Tanavoli, & Zadeh, 2003), the relationship is still unclear. For example, Zachariae and colleagues (1991) found a decrease in plasma cortisol levels after they hypnotically suggested happiness compared to the prehypnosis baseline, while they also reported a “nonsignificant decrease” of the serum cortisol level after suggested anger or depression compared to before hypnosis. One of the limitations of this study was that the circadian rhythm of cortisol was not accounted for in blood sampling or statistical analysis. Conversely, Goodin and colleagues (2012) could not find the expected mitigating effect of hypnosis on the cortisol increase evoked by experimental pain, although they used a select sample of highly hypnotizable subjects and a between-subjects design. However, a within-subjects comparison of pre- and postintervention cortisol reactivity to pain would have been interesting to see. The long-term effects of hypnosis on salivary cortisol were also assessed in a previous study (Thompson, Steffert, Steed, & Gruzelier, 2011) that did not report a significant decrease after 10 relaxation hypnosis sessions. Cortisol levels in this study were not measured immediately after hypnosis but rather on a day with no hypnosis within the first week after the last hypnosis session. Adlercreutz, Kuoppasalmi, Narvanen, Kosunen, and Heikkinen (1982) concluded that hypnosis in itself is insufficient to elicit any hormonal change, only hypnotically suggested emotions can affect hormone levels.

The aim of our study was to investigate the possible role of oxytocin and cortisol in hypnotic interaction. According to our interactional approach to hypnosis (Bányai, 1985; Bányai, Gósi-Greguss, Vágó, Varga, & Horváth, 1990), we extended our measurements to the hypnotist as well, and various paper-and-pencil tests were introduced to gauge the development of the relational experiences of the hypnotic interaction.

Methodological difficulties arise in relation to investigation of the central oxytocin system. For ethical reasons, experimental designs used in animal studies (e.g., by injecting oxytocin or its antagonist into the brain) cannot be applied in humans. Therefore, indirect methods are used in human studies: (a) With the expectation that oxytocin will pass the blood-brain barrier and have a central effect, it is administered through nasal spray with a placebo as the control; (b) measurement of oxytocin levels from the cerebrospinal fluid; and (c) the third possibility
is that the level of oxytocin is measured in the periphery (plasma, saliva, or urine).

In our study, we tracked changes in the levels of oxytocin in the peripheral systems (c), as that is the least invasive and does not interfere in the natural course of the interaction. According to the literature, saliva samples are suited to determine levels of oxytocin (Feldman, Gordon, & Zagoory-Sharon, 2010; Weisman et al., 2012; Zak, Kurzban, & Matzner, 2005).

We hypothesize that oxytocin and cortisol levels will correlate with the relational experiences rather than with the behavior-based scores of hypnotizability. In this exploratory study, however, no distinct hypothesis can be proposed about the nature of the correlation.

METHOD

Participants
We recruited 24 subjects, all of whom were found in the database of the Department of Affective Psychology’s Hypnosis Laboratory and contacted via phone. The contacted subjects had prior group hypnosis experience in which their hypnotizability was determined with the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGS:SHS:A; Shor & Orne, 1962). The recruitment process was continued until the desired sample of 8 low (score: 1–4) 8 medium (score: 5-9), and 8 high (score: 10-12) hypnotizable subjects was reached.

On the basis of Stanford Hypnotic Susceptibility Scale: Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962) scores—measured in the main session—the final sample of subjects contained 11 low (0–4), 10 medium (5–9), and 3 high (10–12) scorers. We also recruited 4 hypnotists, 2 with high hypnotizability and 2 with low hypnotizability.

The enrollment criteria for both subjects and hypnotists included the following: adult male; no medical or recreational drug use; no acute or chronic disease; fluent in Hungarian; literate. Aside from this, all hypnotists were experienced in administering the SHSS:C. Women were not eligible for the study because of the impact of menstrual cycles and oral contraceptives on the studied hormones, which would have caused high heterogeneity in a study with a small sample size (Kirschbaum, Kudielka, Gaab, Schommer, & Hellhammer, 1999; Salonia et al., 2005).

Procedure
All participants were instructed to abstain from caffeine and alcohol on the day of the study, not to eat or drink (except for water), and not to smoke 2 hours prior to the study. Hypnotists and subjects waited in separate rooms prior to the hypnosis session. Baseline saliva samples were obtained from both groups 15 minutes after their arrival. During the
15-minute waiting period, informed consent was obtained, and the state anxiety questionnaire from the State Trait Anxiety Inventory (STAI) was completed (see below).

Following saliva sampling (see below), the SHSS:C was administered by the hypnotist and the hypnosis session was videotaped. According to the SHSS:C protocol, hypnosis induction was a standard relaxation induction with eye fixation, eye closure, and counting from 1 to 20. The hypnotist-subject dyads were determined based on the prior HGHS:A scores of the subjects to obtain a balanced design in which all 4 hypnotists were paired with 2 low, 2 medium, and 2 high hypnotizable subjects. The hypnotists were not informed of the hypnotizability of the subjects or the specific aim of the study. Both hypnotists and subjects were informed that the study focused on “various neuroendocrine correlates of hypnosis.”

After hypnosis, subject and hypnotist returned to their separate rooms and filled out the following questionnaires (see details below): Archaic Involvement Measure (AIM), Phenomenology of Consciousness Inventory (PCI), Dyadic Interactional Harmony (DIH), and the STAI. Subsequently another saliva sample was obtained (approximately 20 minutes after the termination of hypnosis, $M = 19$ min; $SD = 3$ min).

Subjects also filled in the short version of Egna Minnen Beträffande Uppfostran (s–EMBU [My memories of upbringing]) and the trait questionnaire of STAI at the conclusion of the study session. Hypnotists only did so at the end of their first study session.

All saliva samples were collected between 11:00 am and 3:30 pm to avoid bias from hormone circadian variations.

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Saliva collection and sample processing. Unstimulated saliva samples were obtained using oral swabs (Salivette Sarstedt®, Nürenbrecht, Germany). Subjects were asked not to eat or drink at least 30 minutes prior to sampling. Oral swabs were held in the mouth for 1 minute and then placed into coded collection tubes and immediately frozen and stored at $-20^\circ$C until analysis. Salivary oxytocin was measured by enzyme immune assay (EIA; ENZO Life Sciences ADI-900-153); 1.5 ml saliva was precipitated by 1xVol 0.1 M trichloroacetic acid (TCA) followed by C18 SepPack column extraction using acetonitrile: TCA 1.1 mixture. The final eluate was lyophilized by Speed-Vac concentrator, and the sample was reconstructed in a 300 μl assay buffer (5x the concentrate of the original saliva). Salivary cortisol concentration and alpha amylase activity was assessed using the original saliva samples. Salivary cortisol was measured by a commercially available EIA kit (cat number: 1-3002; Salimetrics, State College, PA, USA). Samples were assayed in duplicate using 25 μl saliva per well according to the manufacturer instructions. The sensitivity of the assay is 0.003 μg/dL.
Intra- and interassay coefficients (CV) were 3.35% and 3.75%–6.41%, respectively. The assay does not show significant cross-reactivity with other corticosteroid hormones or sex steroids. The correlation with plasma is 0.91.

Questionnaires

*Archaic Involvement Measure*. The Archaic Involvement Measure (AIM; Nash & Spinler, 1989) is designed to assess the archaic experiences arising between hypnotist and subject. The questionnaire uses a 7-point Likert scale. According to the interactional framework of our laboratory, we used a modified version of the original AIM (Bányai et al., 1990). In this modified version, subjects and hypnotists get separate questionnaires with 22 questions (three negative items are added to the original 19 positive items). In our present study, we used the total AIM score in the analyses, which is based on the 19 positive items. Cronbach’s alpha in the subjects’ sample \((\alpha_s) = .937\); Cronbach’s alpha in the hypnotists’ sample \((\alpha_h) = .923\).

*Phenomenology of Consciousness Inventory*. The subjective alteration of consciousness of the participants was assessed using the Hungarian version (Szabó, 1989, 1993) of the Phenomenology of Consciousness Inventory (PCI; Pekala, 1986, 1991), which is a 53-item questionnaire that quantifies subjects’ phenomenal experience through 12 major and 14 minor dimensions using a Likert-type scale (0–6) on which subjects have to indicate their agreement with two dipolar statements. The dimensions are as follows (minor dimensions in parentheses): Altered experience (altered body image, perception, meaning, and time sense), Positive affect (joy, sexual excitement, and love), negative affect (anger, sadness, and fear), visual imagery (amount and vividness), attention (direction and concentration), self-awareness, altered state of awareness, internal dialogue, rationality, volitional control, memory, and arousal.

*Dyadic Interactional Harmony Questionnaire*. The Dyadic Interactional Harmony Questionnaire (DIH; K. Varga, Józsa, Bányai, & Gősi-Greguss, 2006) is a 50-item, Likert-type scale ranging from 1 to 5 designed for measuring the interactive phenomenological relationship between hypnotist and subject. In our experiment, we used a shorter (40-item) version of the DIH. It has four subscales: Intimacy \((as = .86; \alpha_h = .82)\), communion \((as = .87; \alpha_h = .93)\), playfulness \((as = .874; \alpha_h = .894)\), and tension \((as = .0; \alpha_h = .858)\).

*Short version of Egna Minnen Beträffande Uppfostran* [My memories of upbringing]. The short version of Egna Minnen Beträffande Uppfostran [My memories of upbringing] (s–EMBU; Arrindell et al.,
1999; Perris, Jacobsson, Lindstrom, von Knorring, & Perris, 1980) measures adults’ perceptions of their parents’ rearing behavior. Through 23 items, respondents score the rearing behavior of their mother and father separately. It contains three subscales: rejection, emotional warmth, and overprotection:

- **Rejection**: Punishment, shame, emotional coldness, or criticism characterized the parents’ behavior in the memory of the adult child ($\alpha_s = .801; \alpha_h = .600$);
- **Emotional warmth**: The adult remembers the experience of love, acceptance, and security with respect to parental rearing ($\alpha = .936; \alpha_h = .890$);
- **(Over)Protection**: Excessive fear and anxiety characterizes childhood memories ($\alpha_s = .841; \alpha_h = .0$).

**State Trait Anxiety Inventory.** Spielberger’s State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) is a 40-item questionnaire that measures the anxiety state and the trait anxiety. State anxiety (STAI – state) refers to anxiety related to the present moment, whereas trait anxiety is a more or less stable dimension of personality and indicates general anxiety levels (STAI – trait). Both the state and trait questionnaires present 20 statements describing anxiety to which subjects can answer by one of four descriptors best indicating their degree of emotion (score 1–4; minimum possible score = 20, maximum = 80).

In the present article, we will focus on the relational measures (AIM, DIH, s–EMBU), and the hypnotizability value. Data of PCI, STAI, and amylase concentrations will not be analyzed.

Subscales of low internal consistency values (DIH Tension and s–EMBU overprotection) are also omitted from further analysis.

**Statistical Analysis**

A paired-sample $t$ test was applied to assess the effect of hypnosis on the salivary oxytocin and cortisol concentrations. The association of the questionnaires and the hormone concentration changes was tested with a Pearson correlation. The s–EMBU data of the hypnotists showed a skewed distribution. In these cases, the Spearman correlation was used. The statistical tests were performed using SPSS 17.1.

**Results**

Due to too small amounts of saliva in the samples of hypnotists, only 12 sessions were suitable for the hormone-level analysis. The descriptive statistics for the demographic variables of the 12 subjects are displayed in Table 1. In the final sample, 5 subjects had low, 5 medium,
Table 1
Descriptive Statistics of Subject Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>29.62</td>
<td>6.69</td>
</tr>
<tr>
<td>STAI-trait</td>
<td>43.46</td>
<td>14.66</td>
</tr>
<tr>
<td>Hypnotizability (SHSS:C)</td>
<td>5.33</td>
<td>3.31</td>
</tr>
</tbody>
</table>

Table 2
Distribution of Hypnotists With Different Levels Of Hypnotizability (SHSS:C)

<table>
<thead>
<tr>
<th>Hypnotist</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypnotist 1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hypnotist 2</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Hypnotist 3</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hypnotist 4</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

and 2 high hypnotizability distributed between the 4 hypnotists as shown in Table 2.

Our data show that oxytocin levels slightly decreased in subjects from pre- to posthypnosis, whereas they increased slightly in the hypnotists; none of these changes reached statistical significance. Cortisol levels, however, decreased significantly after hypnosis, both in the subjects, $t(11) = 7.67; p < .001$, and in the hypnotists, $t(11) = 2.55; p < .05$ (see Figure 1 and Table 3).

The changes in oxytocin and cortisol levels were calculated in both the subjects and the hypnotists on the basis of the difference between the pre- and posthypnosis values (prehypnosis values subtracted from posthypnosis values).

The descriptive statistics of the relational measures are summarized in Table 4. The correlation of these “change” values of oxytocin and those of cortisol with the hypnotizability of the subjects and with the relational tests filled out after hypnosis, including the ones administered to the hypnotists (AIM, DIH, and s–EMBU) were calculated.

Because of the small sample size, the majority of the correlations were not statistically significant, so no significant correlations were found between the hypnotizability of the subjects and the level of either oxytocin or cortisol of the participant (see Table 5).

The data of relational questionnaires yielded significant correlations. The Communion factor of the DIH showed a relatively high and significant correlation with the subject’s increase in oxytocin level, $r(9) = .61; p < .05$. Furthermore, the emotional warmth factor of s–EMBU in the
Figure 1. Pre- and posthypnosis salivary oxytocin and cortisol levels of subjects and hypnotists. Note: *p < .05; ns p > .05; error bars represent 95% confidence intervals.

Subjects with respect to their parents showed a high and significant negative correlation with the level of oxytocin increase in the hypnotist, $r(7) = -.90; p < .01$.

None of the correlations between cortisol level changes and the relational tests (AIM, DIH, s–EMBU) proved to be significant.

**Discussion**

Due to the unfortunately small sample size and the relatively large number of statistical tests, the probability of making Type I and Type II errors is great, so our results should be treated with great caution.
It is remarkable, however, that the change in oxytocin level—even with this small sample size—showed highly significant correlations with the variables reflecting relational experiences and not with the hypnotizability of the subjects. Significant correlations were found with the harmony between the interactants (as perceived by the subject and expressed on the DIH) and with the indices that show how the subjects remember the emotional warmth they experienced with their parents (s-EMBU). It is especially interesting that the increase in the oxytocin level of the subjects is not connected to the archaic charge of the current relationship (as measured by the AIM) but to the level the subject’s perceived communion with the hypnotist (DIH).
Table 5
The Correlations (Pearson’s r) Between the Subject’s Hypnotizability (SHSS:C) and the Oxytocin and Cortisol Levels of Subjects and Hypnotists

<table>
<thead>
<tr>
<th></th>
<th>Subject</th>
<th>Hypnotist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin change</td>
<td>Pearson’s r</td>
<td>.43</td>
</tr>
<tr>
<td></td>
<td>df</td>
<td>9</td>
</tr>
<tr>
<td>Cortisol change</td>
<td>Pearson’s r</td>
<td>.42</td>
</tr>
<tr>
<td></td>
<td>df</td>
<td>10</td>
</tr>
</tbody>
</table>

Note. None of the correlations are significant.

In the hypnotists, we found that the less emotional warmth the subjects remembered in relation to their parents, the greater the increase of the hypnotists’ salivary oxytocin concentration. The same was not related to the subjects’ own oxytocin levels.

The subjects filled out s–EMBU at the very end of the experimental session, after hypnosis, following the “post” saliva sample collection. No questions primed the subject regarding early childhood experiences before or during hypnosis. (The childhood experiences could be touched by the age-regression test-suggestion of the SHSS:C, but this suggestion calls for school memories, not parental experiences.)

This could be interpreted as an indication that the subject brought his early relational experiences implicitly into the hypnotic situation, and in the hypnotist, the oxytocin changes appear in relation to the subject’s parental emotional warmth recalled from early childhood on the s–EMBU. This pattern implies that hypnosis might provide a corrective experience: If the subject lacks emotional warmth with his or her parents, there is an increased level of oxytocin in the hypnotist. This change in oxytocin level in the hypnotist corresponds to the calm and connection stress management reaction pattern of oxytocin. Perhaps the hypnotic relationship can offer the subject a model of acceptance based on trust. The decreased cortisol levels of both parties also reflect decreased stress levels. The adaptive nature of the calm and connection stress response has been emphasized by several authors (e.g., DeVries et al., 2003; Uvnäs-Moberg, 1998a, 1998b; Uvnäs-Moberg et al., 2005; Uvnäs-Moberg & Petersson, 2004).

Unfortunately, because there was no control condition in the study, we cannot be sure that the changes in the hormone levels were initiated by the hypnosis induction itself, but a hypnotic interaction is a complex phenomenon, components of which have already been indicated to moderate cortisol and oxytocin levels. Alterations in salivary cortisol levels might be related to the relaxed state during the hypnosis session (Pawlow & Jones, 2002), although there is considerable debate in
the literature concerning relaxation’s effects on cortisol (Kirschbaum & Hellhammer, 1994). There are also reports indicating decreased cortisol levels after warm social contact (Grewen et al., 2005). Further, oxytocin levels are reported to be affected by trust in a dyadic interaction (Zak et al., 2005), which is a key element in a hypnotic dyad as well. Thus, the high level of trust needed from the participants to engage in a one-on-one hypnosis session can be one of the moderators of oxytocin responses.

Clearly, several other nonhypnosis-specific aspects of the relational experience may contribute to similar findings (e.g., establishing rapport, expressing empathy, matching on various client-therapist background variables, etc.). Contrasting hypnotic interactions and nonhypnotic ones can clarify the specific contribution of hypnosis to the results.

In our earlier study (K. Varga, Bányai, Józsa, & Gősi-Greguss, 2008), we reported the relationship between hypnosis style and interactional experiences (DIH). In the cases of maternal-style hypnosis, there was no correlation between subjects’ DIH scores and hypnosis style, but the same correlations were high in the hypnotists. The more maternal the style of hypnosis, the higher the level of intimacy. In our twin study (K. Varga, Bányai, Gősi-Greguss, & Tauszik, 2013), our data showed that the experiences rating the hypnotic interaction (DIH) of monozygotic twins correlated more with each other than with their actual interactional partners (the hypnotists). This harmony was not present in their behavioral (hypnotizability scores) or phenomenological (PCI) response patterns. We interpreted these findings such that the hypnotic settings provide the possibility for the subject to have a relationship experience along the lines of his or her own (early) interactional-experience pattern.

It is also demonstrated that the hypnotist can be deeply involved at the level of experiences (K. Varga, Bányai, & Gősi-Greguss, 1999). In other studies, we found, on the basis of interrelated analysis of data of subjects and hypnotists, points and periods of concordance in the contents of their minds. It was demonstrated by the harmony between the experiences as assessed independently by a parallel experiential analysis technique (PEAT; K. Varga, Bányai, & Gősi-Greguss, 1994) and by the occurrence of visual imaginative synchrony (S. K. Varga & Varga, 2009).

All of these interactional results can be interpreted in accordance with the predictions of the social psychobiological model of hypnosis (Bányai, 1998, 2002a, 2002b). According to this model, a hypnosis situation can provide an opportunity for the activation of early relationship patterns, which in turn may create a corrective experience.

The possibility of supporting the oxytocin system by corrective experiences is significant because it has been indicated that the memory-effects of oxytocin facilitate forgetting adverse social experiences while activating the unconscious network of social memories (Macdonald & Macdonald, 2010). Especially in cases of early neglect or abuse, the
problem is not simply the low levels of oxytocin (Heim et al., 2009) but also the decreased oxytocin responses to social support (Macdonald & Macdonald, 2010). If it remains uncorrected, the unfavorable attachment styles and oxytocin patterns can be transferred to the next generation (Barnett, Buckroyd, & Windle, 2005; Brethelton & Munholland, 1999; Champagne, 2008; Ward et al., 2001). The aim of the correction is to restore the balance between the defense system (activated as a result of threat and uncertainty) and the attachment system (built on the experiences of proximity, trust, and care in a social context). So the provision of corrective experiences may improve the affiliative processes not only for the given person but for his or her offspring too.

Norcross and Wampold (2011) pointed out that at least 100 studies in the past 5 years found that clients in psychotherapy attribute the success of their treatment not to the technique or method but to their relationship with the therapist. The special context and appropriate atmosphere of psychotherapy creates a chance for the modification of the pattern of representation of important relationships (Ludwig-Körner, 1999). This corrective experience may be provided in hypnosis by an enhanced mutual emotional attunement in which the hypnotist perceives, understands and appropriately responds to even unexpressed feelings (Bányai, 2002a, 2008; K. Varga, Józsa, Bányai, & Gösi-Greguss, 2009).

Among the limitations of this study are the small sample size, the high probability of Type I and Type II errors, and the involvement of only male subjects and hypnotists. The biggest question is how the level of oxytocin measured peripherally relates to the central level (which is difficult to measure directly in humans). It is also a shortcoming that we could not replicate the balanced distribution of the sample created on the basis of the subjects’ previous hypnotizability indexes, as in the study SHSS-C scores differed from the initial HGSHS:A scores.

We think, however, that on the basis of these preliminary results it would be worthwhile to systematically study the relationship between hypnosis and levels of oxytocin and cortisol within an interactional framework. It is highly probable that free hypnosis experimental sessions (as opposed to standardized ones) and clinical situations could be better settings to investigate the importance of the actual and early relational experiences.

References


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Oxytocin und Cortisol in Hypnose

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Stephanie Reigel, MD

L’oxytocine et le cortisol en interaction hypnotique

Katalin Varga et Zoltán Kekecs

Résumé: La variation des niveaux d’oxytocine et de cortisol a été testée chez des volontaires en bonne santé durant des interactions hypnotiques
menées dans le cadre de séances standardisées en laboratoire. Les variations préhypnose et posthypnose des niveaux d’oxytocine et de cortisol étaient liées à la susceptibilité des sujets à l’hipnose et aux expériences relationnelles reproduites par les sujets et les hypnotiseurs sur plusieurs tests effectués sur papier. Les résultats indiquent que les changements de niveaux d’oxytocine ne sont pas liés à la susceptibilité hypnotique, mais bien aux expériences relationnelles. Après l’interaction hypnotique, le niveau d’oxytocine des sujets augmentait si l’harmonie perçue entre le sujet et l’hypnotiseur était élevée, alors que ce niveau augmentait chez l’hypnotiseur dans le cas de l’évocation par le sujet de souvenirs de relations émotionnelles non chaleureuses avec ses parents. Ces résultats sont interprétés dans le cadre du modèle socio-psychologique de l’hipnose.

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Oxitocina y Cortisol en Interacción Hipnótica

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Resumen: Se evaluaron los cambios en los niveles de oxitocina y cortisol en voluntarios saludables durante interacciones hipnóticas en sesiones de laboratorio estandarizadas. Los cambios antes y después de hipnosis en oxitocina y cortisol se relacionaron con la susceptibilidad hipnótica de los sujetos y las experiencias de relación descritas entre sujetos e hipnotistas en diversas pruebas de lápiz y papel. Los resultados muestran que los cambios en oxitocina no están relacionados con la susceptibilidad hipnótica pero lo están con las experiencias de relación. Después de la interacción hipnótica, los niveles de oxitocina de los sujetos incrementaron si la percepción de harmonia con el hipnotista era elevada, mientras que se incrementaba en el hipnotista si el sujeto tenía recuerdos emocionalmente menos cálidos de su relación con sus padres. Los resultados se interpretan con el modelo socio psicobiológico de la hipnosis.

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