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Case Report

A multifaceted case-vignette integrating neurofeedback and EMDR in the treatment of complex PTSD

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ABSTRACT

The methods of neurofeedback (Kirk, 2016) and Eye Movement Desensitization and Reprocessing (Shapiro, 2018; Shapiro & Silk Forrest, 1997) will be reflected in relation to a short-time treatment of a patient with complex PTSD and an unspecified dissociative disorder. The aim is to inspire colleges to integrate therapy methods in their quest to help dysregulated patients to become stabile and regulated enough to endure trauma work. This is considered important, especially when working with patients with severe and complex posttraumatic conditions and dissociative disorders, where the evidence-based treatments often not fit for purpose (Corrigan & Hull, 2015). An alternative approach is presented with a single case-study of a patient treated with neurofeedback and EMDR in a psychodynamic short-time psychotherapy. The results of these interventions are presented together with the patient's drawings and reflections and finally discussed.

1. Background

1.1. Complex PTSD and the importance of installing regulative capacity

In complex mental traumatization, as in complex PTSD, Disturbances in Self Organization (DSO; Karatzias et al., 2016) is prevalent in addition to the symptoms of PTSD (relapses, avoidances, permanently altered thought patterns and increased tension). DSO involves difficulties in regulating emotions and relationships, and a negative self-image. When childhood relational experiences, through neglect or abuse, have resulted in attachment deficits, the person feels increasingly threatened, even in neutral situations, and the relational fragility intensifies. Such person can be described as fear-driven (Fisher, 2014). With an increasing degree of traumatization, the difficulties in regulating the self and its experiences heighten and the personality can begin to divide into secondary or tertiary structural dissociation due to pathological dissociation (van der Hart, Nijenhuis, & Steele, 2006). Then, the capacity to endure the evidence-based treatments of trauma will be reduced (Corrigan & Hull, 2015; van der Kolk et al., 2016). This happens partly due to the increasing trauma-related phobias of mental contents (Steele, van der Hart, & Nijenhuis, 2005).

These problems arise partly because of changes in brain activities of individuals with complex traumatization (Teicher & Samson, 2016). Thus, in therapy unintegrated aspects of the inner worlds of dissociative and complexly traumatized patients are particularly important to calm and regulate, and this can be difficult. Though, after experiencing traumatic events, especially those caused by other significant persons or when the patient was very young, the world is also experienced through a different nervous system than before the trauma occured (Schore, 2009; Teicher & Samson, 2016). A person with such experiences may have a much harder time trying to adapt to the evidence-based psychotherapy methods - if these are not tailored to the patient's available window of tolerance (Siegel, 1999) and the regulatory capacity available. We may therefore still need to look for other methods then the evidence-based and integrate them into new applications of existing psychotherapy methods.

Phase-specific trauma-focused treatment (not specifically NFT) was found to normalize the brain's functional network in patients with complex PTSD and complex dissociative disorders (Schlumpf, Nijenhuis, Kleina, Jänckea, & Bachmann, 2019). After treatment, patients showed a decrease in clinical symptoms, increased connectivity of the brain's functional networks and improved emotion regulation. Schlumpf et al. (2019) noted that emotional dysregulation is an important part of all trauma-related disorders and many therapies aim to improve the ability to regulate emotions. They stated that although exposure therapy is effective in reducing symptoms of simple PTSD, many patients who have

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complex PTSD and dissociative disorders appear to have difficulties coping with exposure. The patients become worse and discontinue treatment. Many times, long-term therapies aimed at enhanced regulation, are needed to help the most complex dissociative patients – before any exposure is meaningful to conduct. In their overview of evidence-based treatments of PTSD (Lancaster, Teeters, Gros, & Back, 2016) stated that neurofeedback and brain stimulation techniques may help reduce PTSD symptoms, particularly in treatment-resistant patients.

1.2. Neurofeedback in the treatment of complex PTSD and dissociative disorders

Neurofeedback, also known as EEG (electroencephalogram) biofeedback, is a therapeutic intervention that provides immediate feedback from a computer-based program that assesses brainwave activities. Sound, visual or kinesthetic signals are used to reorganize or retrain these brain signals. Thus, patients learn to regulate and improve their brain function and to alleviate symptoms of various disorders. Research suggests a dramatic change in functional connectivity following only one neurofeedback session (Nicholson et al., 2016), where functional connectivity refers to how areas of the brain communicate with each other. Changing connectivity is a valuable tool in the treatment of PTSD and seems to be enhanced through neurofeedback-treatment (NFT) (Chiba et al., 2019; Reiter, Andersson, & Carlsson, 2016).

1.2.1. Mechanisms of change – NFT

Abnormal connectivity of the brain's large-scale networks seems to be more common in more severe mental illnesses, as our regulatory ability is related to brain functions and specific diagnoses. It is stipulated that NFT can reduce anxiety and improve prefrontal functions (Zhao et al., 2019). In PTSD, the anterior cingulate cortex's (ACC) ability to cooperate with other parts of the brain is impaired. ACC is a part of the brain deep behind the frontal lobe, which controls our self-regulation, ability to stay focused and our attention. It is involved in our processes of learning from past experiences and how we can optimize our decision-making based on that. Thus, a general good cooperation between different parts of the brain affects our impulse control and the ability to act flexibly (Kirk et al., 2016; Siegel, 1999; Solomon & Siegel, 2003).

Albeit we do not yet know how NFT has an effect on dissociative disorders, Manchester, Allen, and Tachiki (1998) described a study where eleven DID patients received major and sustained improvements in 30 individual NFT sessions plus ten group sessions. However, the article does not indicate how their pathological dissociation had been initially diagnosed. Fisher, Lanius, and Frewern (2016) described how a very symptom-burdened and dysregulated DID patient was improved by twenty NFT sessions. These results were discussed with Fisher (2016, personal communication). She stated that even if she conducted close to three hundred sessions with the patient, before the person got functional and managed her life well, significant changes in reduced self-harm and flashbacks could be seen already after twenty sessions, which was what was described in the article.

1.3. Eye Movement Desensitization and Reprocessing (EMDR) in the treatment of complex PTSD and dissociative disorders

Eye movement desensitization and reprocessing (EMDR) is a form of psychotherapy that begun in 1987 (Shapiro & Silk Forrest, 1997) in which the person being treated is asked to recall distressing images while experiencing bilateral sensory input, for example side-to-side eye movements, or tapping on hands or knees (Feske, 1998). EMDR is included in several evidence-based guidelines for the treatment of PTSD (Lancaster et al., 2016; Schnyder & Cloitre, 2015; WHO, 2013). The method is today used in a broader array of psychiatric conditions, apart from PTSD (Shapiro, 2018). Also RCTs conducted in the treatment of comorbid traumatic events in psychosis, bipolar disorder, unipolar depression, anxiety disorders, substance use disorders, and chronic back pain exist (Valiente-Gómez et al., 2017), where preliminary evidence suggests that EMDR therapy might be useful to improve psychotic or affective symptoms and could be an add-on treatment in chronic pain conditions.

1.3.1. Mechanisms of change – EMDR

Proposed mechanisms of change due to EMDR-treatment, includes the Adaptive Information Processing (AIP) model (Hase, Balmaceda, Ostacoli, Liebermann, & Hofmann, 2017; Shapiro, 1995, 2006). The AIP-model states that until unhealed memories are processed, maladaptive responses are likely to continue, and problems arise as a result of non-functionally held information (Shapiro, 2001). According to the AIP model a particularly distressing incident may become frozen in time in its own neural network, unable to connect with other memory networks that hold adaptive information.

Changes in regional blood flow of the brain is described after EMDR-treatment, giving preliminary evidence of distinct neurobiological patterns of brain activations during bilateral stimulation associated with a significant relief from negative emotional experiences (Pagani et al., 2012). Patients post-EMDR showed a significant growth of gray matter volume after successful EMD-treatment (Bossini et al., 2017).

There is some consensus regarding the underlying biological mechanisms involved. The three hypothesises that have received the most attention and research support are: (1) taxing working memory, (2) orienting response, and (3) rapid eye movements (REM) sleep, where the similarities with the introduced state when conducting EMDR and REM is considered (Lee & Cuijpers, 2013). Shapiro (2018) stated that possibly all three hypothesises can be valid and that they appear in different stages of memory (re)processing.

2. The therapy of Sanya

Here, an individual short-time therapy with a traumatized patient, with complex PTSD (Herman, 1992; Powers et al., 2017), and an unspecified dissociative disorder (DSM-5, 2013) will be presented. The patient was treated with 11 sessions under four months and a follow up was conducted after four months.

2.1. Initial status

Sanya suffered from PTSD, which was noticed by a former therapist and Sanya came to me. She was a friendly and adequate person in her 40s – but symptom burdened, she scored initially 67 on PCL-5 (Post-traumatic Check List-5; Weathers et al., 2013), see Table 1. She lived an orderly life, she worked and took care of her child, though was heavily symptomatic and could barely handle her life situation. She had friends but had, after the death of her brother two years before, withdrawn and isolated herself more and more. She was plagued by anxiety and flashbacks. She lived alone with her child and described that it had been almost impossible for her to date since she broke up from an abusive relationship 15 years ago.

Since then, in addition to suffering from a severe PTSD, she also had been plagued by complex pain problems, due to residual nerve damage following severe beatings against her head and neck. She had been in contact with a neurologist for 13 years and had

Table 1
Sanya's self-assessed ratings before, under and after the treatment.

Instruments	Initial assessment I	Initial assessment II	After 5 NFT	After 10 NFT	After EMDR	4 months follow-up
SCL-90-R	200	223	153.5	22	8	4
DES/DEST (%)	82/65	73/51	67.5/47.5	3/0		2/0
PCL-5	67	71	56	31	7	12
SDQ-5[a]	18 (13)	22 (17)	6 (9)	5		
SR-scale	8.2	8.1	4.7	2.4	0.2	
PSOM	10	5	7	16	18	18

SCL-90-R (Symptom Check List 90 Revised; Derogatis, 1994), DES and DES-T (Dissociative Events Scale and Dissociative Events Scale-taxon; Carlson, & Putnam, 1993), PCL-5 (Post-traumatic Check List-5; Weathers et al., 2013), SDQ-5 (Somatoform Dissociation Questionnaire; Nijenhuis et al., 1997), SR-scale (Symptom Rating Scale; Nilsson & Nilsson, 2014), PSOM-S (Positive States of Mind; Adler, Horowitz, Garcia, & Moyer, 1998).

[a] Values in brackets are without question 2: *My body, or a part of it, is insensitive to pain*, as the patient initially was heavily medicated against her pain.

regularly been given injections with a combination of cortisone and painkillers such as nerve blockers. During the first six to seven years after the abuse, she had pain attacks six days a week. At the start of our therapy it was somewhat better.

Sanya's pain problems had worsened considerably after her brother was murdered, which made me think that the pain was partly of psychological origin. Thus, the treatment that she would be offered should hypothetically have an effect also on her pain condition. Sanya also told that in connection with the abusive relationship she developed asthma, which she still suffered from. She had repeatedly been prescribed SSRIs and sleep medicine but not used them.

Sanya wanted help with her anxiety and trauma-related symptoms, including flashbacks, that had followed her from early childhood but had escalated after her brother was murdered in gang-related violence two years ago. Sanya had during childhood experienced war and civil war with missing and murdered relatives, as well as sexual abuse from a close relative between six and eight years of age. As she grew up in a culture of honour and shame, she could not talk about the abuse during her childhood. According to herself, she would have been murdered if she had.

During Sanya's childhood, her parents were occupied with dealing with the violence and horrors of their home country. Despite this she described a good relationship with one of her parents. Though, the sexual abuse was not noticed. Sanya's childhood had left her with a feeling of abandonment and abuse, especially from one of the parents. Her father disappeared in the war and was gone for several years during her childhood. After the flight to Sweden, she dared to tell about the sexual abuse in her home country. She was believed, but also forced to go through hymen reconstruction surgery. Finally, the patient's own relationship, as a young adult, with an abusive partner, and the murder of her brother added to her traumatization. She had not been able to complete her college studies because of the pronounced flashbacks and concentration difficulties she daily struggled with. She could work despite her difficulties. Sanya stated that she would like to have an intimate relationship but that she was too afraid for that.

2.2. Screening

At the initial assessment interview, Sanya filled in various self-assessment forms and was found fulfilling criteria for PTSD (67 on PCL-5), see Table 1. She also fulfilled criteria for complex PTSD and an unspecified dissociative disorder according to SCID-D (Steinberg, 1994). Sanya's initial assessment on the Symton Rating Scale (SR-scale) was 8,2 out of 10 possible (Nilsson & Nilsson, 2014). The SR-scale is a 10-degree scale with 15 symptoms, where no degree of disturbance is 0 and 10 is the worst degree of symptoms, regarding following symptoms; difficulty falling asleep, frequent awakening, nightmares, intrusive memories, fear, anxiety, pondering, despondency, lack of self-esteem, lack of concentration, sensitivity of sound, irritability, anger/outburst, fatigue and muscle soreness. On PSOM-S, a self-assessment questionnaire that asks questions about different types of favourable states of mind that the person has experienced in the last 7 days, Sanya initially scored low (the higher values, the better).

When we started treatment after ten weeks, her scores were still very high, apart from PSOM-S that was very low, see Table 1. She scored for example 223 on SCL-90-R (Symptom Check List 90 Revised; Derogatis, 1994), with very high values on the subscales for somatization, obsessive-compulsive, depression and anxiety, and she got high values on PCL-5. Her symptoms were still as painful as at the first measurement and may have worsened during the waiting period. Her PTSD symptoms were troublesome and her pain problems were acute. In addition, Sanya was now in mourning. Shortly after our first assessment interview, the parent who had been close to her, suddenly passed away. According to Sanya, the parent died of the consequences of grief and despair after Sanya's brother was murdered. Sanya was plagued by re-experiences, intrusions, negative thoughts, severe, extreme heightened tension, sleep-disturbances, and interpersonal fragility, negative self-concepts, including self-accusations, and affect dysregulation. Her self-assessed dissociation was high, 73% on the dissociative events scale, DES and 51% on the DES-T (Carlson, & Putnam, 1993), and 17 (or 22 if her pain-registration was included) on the Somatoform Dissociation Questionnaire (SDQ-5; Nijenhuis, Spinhoven, Van Dyck, Van der Hart, & Vanderlinden, 1997).

Sanya tried NFT as an initial stabilization in what was intended as a longer treatment contact. I completed the SCID-D (Steinberg, 1994) in parallel with the initial NFT sessions. The interview showed that she fulfilled criteria for an unspecified dissociative disorder apart from her complex PTSD. Sanya described that she had suffered her dissociative symptoms since she was sexually abused by the close relative in childhood. But she clearly knew and felt that it was her own experiences, even when she felt divided, was flooded with flash backs, or otherwise was in contact with her previous vulnerability and traumatic experiences.

Despite Sanya's severe and painful symptoms of childhood sexual abuse and severe violence in a close relationship as an adult, she had a partly secure relationship with one of her parents. Thus, she did not fulfil criteria for a disorganized attachment style, even though she fulfilled criteria for an unspecified dissociative disorder.

2.3. The treatment

As Sanya, due to her diagnoses, was considered to be emotionally fragile, easily triggered, and plagued with trauma-related phobias of mental contents, stabilization was needed. Neurofeedback, infra-low frequency training (Othmer & Othmer, 2009) was used during ten sessions for stabilization,

and the short-time therapy ended with one EMDR session (Shapiro, 2018). These treatment methods were administrated in the frame of a resource-oriented psychodynamic psychotherapy, aiming at installation of hope and a reestablishment of human relations as safe enough, and reassuring. The SR-scale was used each week.

Sanya went through her first NFT session (20 minutes), and as usual, I ended the session with a short resource-activating hypnotic induction (Gerge, 2018). In the evening after the session she fell asleep easily, to her own surprise. After our second NFT session a week later (25 minutes) she slept well for a whole night. At the third NFT session, Sanya got a clear relaxation response and was relaxed and happy during the session. From now on we used NFT for 30-minutes in our sessions. At the fifth session, she said that she now experienced a greater calm and better patience in her everyday life, and that she slept better. She said that she now was so calm that she could think without getting disordered. Her score on the SR-scale had dropped from 8.2 to 4.7, and her somatoform dissociation had dropped to 6 (or 9 if her pain-perception was included). She stilled scored high on the DES-scale, DES-T, PCL-5, and SCL-90-R, see Table 1, though her symptoms had significantly been reduced.

During the sixth NFT session, Sanya said that she was calmer, even during work-hours, and slept much better. At our seventh session, the Halloween weekend had passed and Sanya had had a period of great sorrow and missing. She thought a lot about her parent who had died and Sanya had had a lot of pain in her injured body parts. The week after that, when we had our eighth NFT session, Sanya was calmer. She now assessed her symptoms to 2.4 (out of 10 possible) on the SR-Scale. She had also taken a professional contact on her child's behalf (the child missed her deceased grandparent). During this session, Sanya practiced neurofeedback for the first time with the electrodes placed in the prefrontal region on the right side of her head. First, Sanya became more relaxed and calmer. Then she felt a growing tension in her shoulders. When the tension eased, she experienced a strong sense of despair and sadness. Finally, Sanya got very tired. We ended with what is considered a more stabilizing position with the electrodes above the right ear and the right parietal lobe (Kolk et al., 2016) and Sanya became very calm and tired - in a positive sense.

During our ninth session, Sanya said that she now was doing fine. She slept better and woke up only once a night and could easily fall asleep again. She could now make friends and make decisions. Previously she had been too uncertain to do so. She got a deep relaxation response during the NFT. At the tenth NFT session, she told that she now slept well, felt better, and easier could think and make decisions. The difficulty with making decisions had previously been a huge problem for her during many years. Her friends had commented that she now seemed happier and had started laughing. She also stated that she now did not got so angry anymore.

After these ten NFT sessions, that had heightened Sanyas's regulative capacity, we decided to continue with EMDR. Sanya's self-assessed symptoms were now also significantly better, see Table 1.

2.4. An ending EMDR session

In the following one EMDR-session will be described. The EMDR standard protocol was complemented with an Ego State intervention (Watkins & Watkins, 1997). The negative cognition: *I got really scared* was accepted, even though it was a statement about an emotional state and not a generic negative belief about the self. With patients with more than PTSD it might be wiser to follow their process then to strictly follow manuals.

The day before our session, Sanya was present when a person stopped breathing at her workplace. She had to deal with the situation and did well, including carrying out life-saving activities until the ambulance arrived (Sanya did not have a health care profession). The person survived. Below is a summary of the EMDR session we conducted with the event as a starting point.

Negative cognition: *I got really scared.*

Positive cognition: *I dared to stay in the situation* (this was a "7", maximally true, so Sanya had to find another meaning); *I can handle this*. It goes from 4–5 to 7 (that it is completely true) during the EMDR-session.

Feeling: *Panic.*

Subject units of discomfort, SUDs: 1 that goes to 0.

Body: *A pressure over the chest, like having a weak panic attack.*

Thera-Tappers held in hands were used as ongoing anchors of presence, further enhancing dual awareness, and eye movements (EM) *I just want to cry* (EM) cry (EM) *back to the positive – it went well* (EM) *relaxed again* (EM) *do not know* … *just feel stronger* (EM) *feel like I'm fixing this* (EM) *I've managed this, I know that* … (EM) *now I want to be there for others* (EM) *I think – I feel safer in myself* (EM) *relaxed, my shoulders are lighter now* (EM). Going back to the original image: *That I was there on site* (EM) *a lot of feelings, but I am not so afraid anymore* (EM) *my brother* … *in the hospital* (EM) *deep despair* (Here hypnosis-based Ego State work is intruded (Watkins & Watkins, 1997; Watkins & Barabasz, 2008) and Sanya is suggested to contact herself in the inner imagined scene at the hospital, where her murdered brother lies, and say, "so that her ears can hear": I have come now and I will help you. She says this sentence and she is also urged to allow Sanya from that day to lean towards herself now – and experience and receive the support given. She gets very moved. (EM) *It feels like I can take a final farewell of him* (Sanya is now crying hard) (EM) … *an inner conversation* … (where Sanya is urged to say: I love you, I forgive you … (EM) *calmer* … *he shrugs his shoulders a little, smiling* (EM) Sanya is asked to go back to the starting point: *it is not the same* … (what happened yesterday and the death of the brother) (EM) *it is calm* (EM) *very strong pain in the head* (Sanya gets a glass of water and is helped to do vertical eye movements) (EM) *ok* (EM) … *my brother looks at me* (she is asked if he wants to say something) *he just smiles* (EM). Then we move on to the final cognitive evaluations, ending the EMDR-session.

A few days later we had contact via mail/sms and Sanya announced that she was tired after the session, but now sleeps easily and well and that she can think about and talk about her brother in a new way.

Six weeks after the EMDR-session we met for a last session. Sanya now stated that she had a deepened sense of joy in her life.

3. Result

After our short-time therapy Sanya was no longer depressed and suffered no anxiety. Her symptom-burdened complex PTSD has been resolved, see Table 1.

She had gone from having a complex PTSD and an unspecified dissociative disorder to no longer suffering trauma-related symptoms. 71 points on PCL-5 had decreased to 31 after ten sessions of NFT, and now six weeks after our EMDR session she scored 7 points. She had dropped from 223 to 8 on the CSL-90-R, and from 8.2 to 0.2 on the Symptom Rating Scale (Nilsson & Nilsson, 2014). She felt that she now could get help and support from others – and that she could give help and support to others. Now she could also talk about death with her child. In the past, she couldn't handle that. Her pain-attacks due to nerve damage has become much less frequent and she did not need to get nerve blockades as often as before.

At four months follow up she still scored at a non-clinical level on the self-assessment questionnaires PCL-C, SCL-90-R, the DES, DES-T, and PSOM-S, see Table 1. Sanya initially had a lot of somatoform dissociation (Nijenhuis 1999/2004), screened by SDQ-5. During our tenth NFT sessions, both her somatoform and psychoform dissociation melted away and her somatoform dissociation went from 17 (or 22 if her ongoing pain registration was counted) to 5 on SDQ-5.

Sanya stated after the treatment that she now was more open to start a new intimate relationship and that, for the first time in her life, she knew what she wanted from a partner. She had also started studying at the university in parallel with her work. She wanted to graduate.

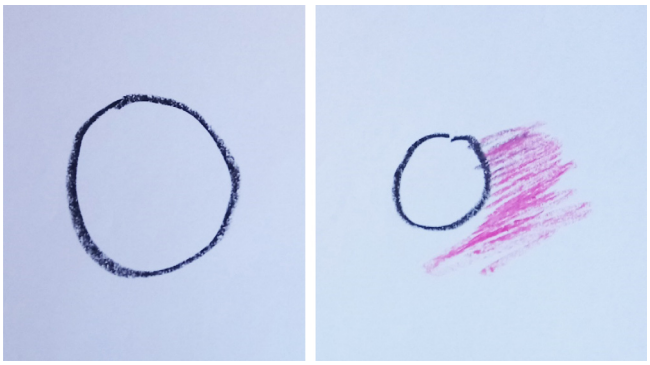
3.1. Sanya's own comments and drawings

Below you can see how Sanya herself described how she experienced the NFT treatment. One month after Sanya ended the 10 NFT sessions and the EMDR session, the following mail came:

> I feel more secure in myself. I've got more energy. I sleep better and I more easily manage my grief day by day. I dare to take new steps in my job and have more energy with my child. Neurofeedback has been a great help.
> What amazes me is that I fall asleep easier for the first time in a long time. I can be in the moment when I am reminded of (traumatic) memories and dare to talk about them. I talk about my memories quite a lot. In the past, I avoided it because I didn't dare cry together with others. But now, even though I cry, I don't break down.
> I am grateful that I received tips of NFT treatment, I had previously had my problems for so many years. Big thanks for the help!

Picture a, the picture Sanya made before the treatment started "*my messy life right now – unfair*":

Picture b and c, the pictures Sanya made before and after our first NFT-session, b, *my self, very big very empty*, and c, *still me, I want the pink to grow more*:



Picture d, after 10 NFT and one EMDR session: *Energetic and happy* and at four months follow up the happy face is even bigger and Sanya named the picture: *Joy and relief – I feel at ease. Hope, I have hope for life.*

4. Discussion

It was not until Sanya was given the follow-up questions on the SCID-D (Steinberg, 1994), that it became clear that she was not suffering a dissociative identity disorder, DID. The further treatment also verified the initial diagnoses; that Sanya suffered complex PTSD and an unspecified dissociative disorder. Probably a person with DID cannot be cured in 11 sessions either. The importance of adequate diagnostics, where the multiple A criteria, screening for dissociation (DES/DES-T) and actual diagnostics (SCID-D) are clearly distinguished is a learning we can draw from this vignette.

Despite a severe PTSD with dissociative co-morbidity and a massive childhood traumatization, Sanya had a partly secure attachment-pattern in relation to one of her parents. Even though she initially fulfilled criteria for complex PTSD and an unspecified

dissociative disorder, her personal resources, including life choices, made it possible to help her in the context of a short-term therapy. Still, it was surprising how fast and easy the process went. The combination of neurofeedback and EMDR framed in a psychodynamic setting seemed valuable for her.

NFT was found as a surprisingly effective part of the treatment, contributing to reduced symptoms, including decreased pathological dissociation, increased regulatory ability and opened to the opportunity to tell a more coherent and congruent life story. The method pawed the way for EMDR-treatment. When working with Sanya it felt important to not unnecessarily increase her trauma-related arousal. The neurofeedback-training offered the possibility of regulation without unnecessarily raising her arousal level or her amount of flashbacks.

Initially, Sanya was able to make use of the reflective space and relational support offered by the psychodynamic therapy. But, supposedly, only relational work would not sufficiently had stabilized her, at least not as fast as it was done here, and perhaps not only neurofeedback either. But neurofeedback conducted within a general psychodynamic frame seemed to help Sanya regulate herself. She could calm her fear-driven midbrain, and heighten her integrative capacity. The relational support, knowledge of mental traumatization and the concluding EMDR treatment have been important parts of the treatment. Neurofeedback alone probably would not have been enough.

Whether neurofeedback can become an evidence-based method for mitigating and stabilizing healing processes of highly dysregulated patients, we do not yet know. Hypothetically NFT can contribute to increased regulation AND greater access to trauma-related material. Then, NFT and other not yet evidence-based methods as part of psychotherapy for traumatized patients need to be applied with care. We need to acknowledge the consequences of complex mental traumatization, including the initial relational fragility and the trauma-related phobias of mental contents.

Disclosure of interest

The author declares that he has no competing interest.

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