CASE STUDY

An Outcome of Psychodynamic Psychotherapy: A Case Study of the Change in Serotonin Transporter Binding and the Activation of the Dream Screen

PIRJO IRMELI SAARINEN, M.D., Ph.D.[1]
JOHANNES LEHTONEN, M.D., Ph.D.[2]
MIKKO JOENSUU, M.D.*
TOMMI TOLMUNEN, M.D.[3]
PASI AHOLA, M.D.[4]
RITVA VANNINEN, M.D., Ph.D.**
JYRKI KUIKKA, Ph.D.***
JARI TIIHONEN, M.D., Ph.D.****

We explored the outcome of psychodynamic psychotherapy of a female patient with major depression using clinical evaluation and serotonin transporter (SERT) binding assessed with [^{123}I]nor-β-CIT SPECT. The psychotherapy process was analyzed with special emphasis on the change that was recognized in the dreaming process. The activation of the dream screen in transference seemed to form a turning point during the psychotherapy. Normalization of SERT binding at the midbrain level was found on 12-month follow-up. Major alleviation of depressive symptoms assessed by rating scales was evident only six months after SERT normalization.

[1]Chief of Adult Psychiatry Division, [2]Professor, [3]Senior Physician, [4]Clinical Instructor, Department of Psychiatry, Kuopio University Hospital. ***Mailing address:*** Department of Psychiatry, Kuopio University Hospital, P.O. Box 1777, FIN-70211 Kuopio, Finland. e-mail: pirjo.saarinen@kuh.fi
**Senior Lecturer, Department of Clinical Radiology, Kuopio University Hospital.
***Professor, Department of Clinical Physiology and Nuclear Medicine, Kuopio University Hospital.
****Professor, Department of Forensic Psychiatry, Kuopio University and Niuvanniemi Hospital.

INTRODUCTION

There is evidence that serotonin transporter densities are altered in depression. The findings of Malison et al. (1998) suggested the first reductions in the density of brain serotonin transporter (SERT) binding sites in living depressed patients. Single-photon emission computed tomography (SPECT) is useful and sensitive in imaging neurochemical systems *in vivo*, but has been less frequently applied in studying affective disorders than, for example, schizophrenia (Grasby, 1999).

A decreased serotonin transporter level associated with depression and its normalization during the course of psychodynamic psychotherapy has been reported in a case-control study using SPECT imaging (Viinamäki, Kuikka, Tiihonen, & Lehtonen, 1998). It has also been suggested that the learning about oneself which occurs in psychotherapy may in itself influence the structure and function of the brain (Kandel, 1998). Furthermore, Gabbard expressed an opinion that psychotherapy may produce lasting improvements and alter brain functioning (Gabbard, 2001).

Dream Screen

Traditionally, it has been assumed that significant psychotherapeutic interaction is reflected in the dreams of the patient. An important part of dreaming occurs during REM sleep. According to Reiser (1997), the neurons in the visual cortex are just as active during REM sleep as when the subject is looking at an outside scene while awake. The capacity for dreaming seems to depend on the early relationship between the mother and her child, with implications for both the psychology and neurophysiology of the infant-mother relationship (Lehtonen, 1997, 2002, 2003).

The "dream screen", also called a dream matrix, can be seen as the basic organization of dream elements (Lehtonen, 1997). The concept was first introduced by Lewin in 1946 (Lewin, 1953), for whom the screen represented the breast during sleep. Later, he concluded that the dream screen is not only a simple projection screen for the dream picture; it is also an integral wish-fulfilling element in the dream. In actual dreaming, the dream screen can exist in the form of a landscape, a mountain or a hill that is able to connect different visual symbols, so the dream can be shaped into a holistic entity. The activation of the dream screen in adult transference during psychoanalysis (Lehtonen, 1997; Rycroft, 1951; Boyer, 1960) and psychotherapy (Saarinen, 2003) signifies a turning point during the psychotherapy process. During a psychoanalytic/psychotherapeutic process the dream screen is able to support a double cathexis, a narcissistic one

and an object-related real-person cathexis, which makes the dream screen a bridge from a narcissistic orientation to object relations (Boyer, 1960).

AIM OF THE STUDY

In order to explore the outcome of psychodynamic psychotherapy of a patient with major depression, we analyzed serotonin transporter binding of the brain at baseline and on twelve-month follow-up. The severity of depression was assessed by depression rating scales at baseline and on follow-up after twelve and eighteen months. We also analyzed the psychotherapy process, placing special emphasis on dreams implying activation of the dream screen. We aimed to clarify by means of our case-report how these two different domains, biological and psychodynamic, might be connected in a real clinical setting.

METHODS

Patient

Ms. J was a 20-year-old female and referred to psychodynamic psychotherapy by a psychiatrist in a municipal health center because of depression and difficulty in graduating from a commercial institute. She had received neither psychotherapy nor psychotropic drugs prior to the SPECT imaging and used no psychotropic medication during the treatment.

Ms. J was the second of three children. She had a sister who was six years older and a brother four years younger. Her mother's pregnancy and childbirth were normal. She described her mother as being demanding and controlling. Her mother, she told the psychotherapist, often had aggressive shouting fits. The father was psychologically absent.

Ms. J went to primary school at the age of six. When she was ten years old her family moved and she lost all her friends. At the age of eleven she heard about a new man in her mother's life. At the same time Ms. J began to feel nervous around other people. She constantly felt that other people were staring at her and thinking that she was odd. She began to have more difficulties at school because of these fears.

One year later her parents divorced. At the same age her menstrual periods began. Between the ages of twelve and nineteen, Ms. J lived together with her mother and her brother. She contacted her father twice a month until the age of eighteen. She frequently had to be alone with her brother during the days and sometimes also at nights, because their mother was away from home. Ms. J felt that she had no time for herself or her friends. However, her mother was not satisfied with her and her brother

often had nightmares. She threatened her brother and shouted at him because she felt so tied down and misunderstood, especially by her mother.

At the beginning of the psychotherapy, Ms. J tried to study at a commercial institute, but she was often unable to go to school. She felt she was causing problems for everyone. She was very close to her sister. The relationship with her brother was also good, but Ms. J had strong feelings of guilt because of their childhood experiences. Her relationship with her mother and her father was very ambivalent.

Psychiatric Evaluation

Psychiatric diagnosis was based on clinical assessment and verified using the Structured Clinical Interview for DSM-IV-R (SCID-I, SCID-II) (Spitzer, Williams, Gibbon, & First, 1992) by a trained independent psychiatrist. SCID-II was assessed on 12-month follow-up in order to prevent major depression biasing the assessment of personality pathology. The severity of depression was assessed at baseline and on 12- and 18-month follow-up with the 17-item Hamilton Depression Rating Scale (HRSD) (Hamilton, 1960) and the Montgomery Åsberg Depression Rating Scale (MADRAS) (1978).

Outcome Variables

We used [123I]nor-β-CIT SPECT imaging to assess serotonin transporter function. This method has been presented earlier in detail (Hiltunen et al. 1998, Kuiika et al. 2001). SPECT imaging was performed at baseline and on 12-month follow-up (Figure 1) on the Wednesday following menstrual bleeding. Functional neuroanatomy by means of SPECT was confirmed using magnetic resonance imaging (MRI) within two weeks of the baseline imaging.

Healthy Controls

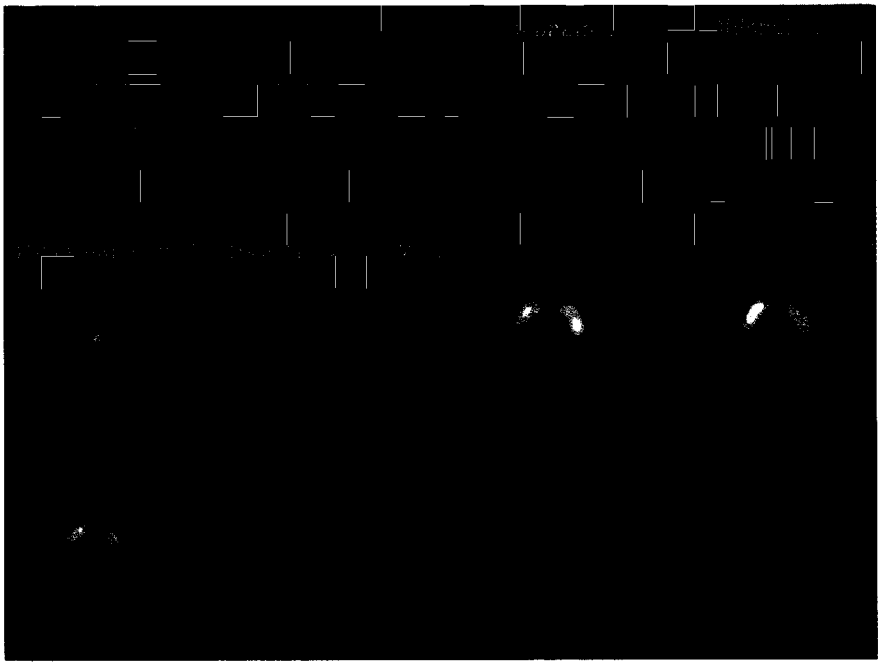
The group of ten healthy age- and sex-matched controls consisted of employees of Kuopio University Hospital or medical students. Depression was an exclusion criteria for the control group. The controls had received no previous psychotropic medication or other psychiatric treatment and were physically healthy.

Setting, Therapist and Therapy

The psychotherapy consisted of 80 sessions per year, twice a week, in the outpatient clinic of the Department of Psychiatry of Kuopio University Hospital. The psychotherapist had postgraduate formal professional training in psychodynamic psychotherapy and had practiced dynamically-

Figure 1.

TWELVE TRANSAXIAL SLICES (6 MM THICK) ORIENTED TO ANTERIOR COMISSURA—POSTERIOR COMISSURA (AC-PC LINE) OF THE WHOLE BRAIN SPECT SCAN 6 H AFTER INJECTION OF 191 MBQ OF [^{123}I]NOR-β-CIT IN 20 YEAR OLD FEMALE WITH MAJOR DEPRESSION. REGIONS OF INTEREST WERE DRAWN ONTO THE TWO CONSECUTIVE SLICES AT THE LEVEL OF MIDBRAIN (TOP, RIGHT) AND ONTO THE CEREBELLUM (TOP, LEFT) USING A TEMPLATE BASED ON MRI ANATOMY.



oriented individual therapy for over twenty years. The patient and the therapist had not met before the first psychotherapy session.

The study design was approved by the ethics committee of Kuopio University Hospital. Although the patient was assessed at baseline to suffer from major depression, we did not initiate antidepressant treatment. The possibility of an increased risk of suicide or attempted suicide in placebo groups was tested in two analyses of depressive patients treated with a placebo in antidepressant clinical trials (Storosum, van Zwieten, van den Brink, Gersons, & Broekmans, 2001; Khan, A., Khan, S., Kolts, & Brown, 2003). According to these studies the assumption that patients with major depression who were assigned to the placebo group were exposed to substantial morbidity and mortality was not supported by the research data. The same ethical conclusion was also accepted in this study. After

complete description of the study to the patient, written informed consent was obtained.

RESULTS

Psychotherapy Process

The early working alliance and the transference with Ms. J were established quite easily. She was a very pleasant and beautiful young woman with depressed and pessimistic thoughts, strong feelings of worthlessness and guilt. Ms. J felt that she had failed in everything in her life. She idealized her father and thought that her mother had provoked the unhappiness of the whole family. She even had physical feelings of nausea when she remembered her mother's shouting. She did not have any memories before the age of six and only some vague memories before the divorce of her parents. She felt that every one was staring at her, especially because of her appearance, and she considered herself very ugly. She wanted to graduate from the commercial institute, but did not know what she would like to do after that. However, she was very motivated to undergo the psychotherapy.

At the beginning of the psychotherapy, Ms. J frequently saw a recurrent dream that she was falling down the elevator shaft of her grandparents' house, although her mother's mother tried to help her. She did not know how to interpret this dream. She also told the psychotherapist that during her childhood she saw often a dream with bears that wanted to come in through the door of her room. Somehow these dreams were like fairy tales. She interpreted these childhood dreams as being a sign of her threatening mother. Ms. J also dreamed her first dream about the therapist, who was a very sadistic and threatening teacher in the dream. She interpreted this dream as indicating that she was afraid the therapist would consider her a very dull person. The therapist thought that these dreams were also a sign of primitive rage and fear of it.

At the age of ten, Ms. J had developed asthmatic symptoms and even received medication for one year. Before school age she also had an anaphylactic shock reaction, but she did not know the reason for it. At the age of seventeen she had mononucleosis and serious liver and pancreas inflammation. At the time of the study she often suffered migraine attacks. After telling the therapist about these somatic symptoms and diseases, the patient dreamed a dream in which she broke the furniture of her friend's room. She interpreted this aggression as being like breaking someone's bones during a fight. Just before awakening she had seen someone who said that there was a person who could save her. Between the sleeping and

the waking state she saw an image on the wall of a kindly smiling fairy woman, who promised to help her. For the first time Ms. J told the therapist she was longing for the therapy. She also thought that she might be an intelligent young woman.

The patient told the therapist that if she could not come to psychotherapy, she would go mad. She had a strong wish to die. For the first time she had the courage to be angry with her mother. On the other hand, she wanted her mother's nurturing. She dreamed a dream in which she was fighting with a crocodile. The crocodile bit her, but did not wound her badly. She trusted in the crocodile's good will. Although she had some good moments in her life, she did not feel that her joy was real. One evening she had a panic attack during which she could not breathe normally and she was afraid she would die from choking or of a heart attack. She remembered the anaphylactic shock during her childhood and after remembering that incident she was able to calm herself. After these events she was able to study at the institute every day and she was awarded the certificate with good grades. She felt that she was able to be more independent and to think in her own way.

Activation of the Dream Screen

After the summer holiday the patient had shown scars on both her arms, which she had made eight months before. When she cut herself she had been drunk and felt that nobody liked her. The internalized image of the psychotherapist remained during the holiday separation and gave her courage to show these scars. Now she had courage to feel angry against the inner image of her father. At the beginning of the therapy this image of her father was only idealized. It was her twenty first birthday and for the first time in years she was happy about having been born.

Ms. J had a dream in which she was in a house on the top of a mountain. She had come to see the father of the family living in this house. She watched children playing with happiness and joy on the mountainside, although she herself had a fear of falling down. During the same session she asked for money for the bus, but said at once: "Of course I know, you are not my mother!" For the first time she said that she was longing for her mother very much. She also told the therapist that she was very depressed and lonely. Ms. J had experienced these same feelings during her adolescence when she was with her brother at home and the mother was not satisfied with her. She also told the therapist that her father had serious drinking problems during the divorce and that he had threatened to commit suicide. Once, during the night, the father had threatened to

shoot his wife with a hand gun. Ms. J saw this traumatic event but had not spoken of it to anybody. She expressed the fear that she might not see her mother alive again. She realized that she had also had the same fear in those days.

Working Through

Ms. J had attacks during which she had feelings of terror and she was afraid of going mad. When she was able to discuss these moments in psychotherapy, she said her mind became clearer. According to the patient the psychotherapy had given her strength to study, to work and to be more independent in relationships. She reflected on her feelings of guilt over mistreating her brother, over saying that she would kill him during the night. By dealing with her own feelings of guilt she could better understand how her mother could have the same feelings of guilt for all her three children. By the shared working through, the patient was also able to believe that the therapist had no wish to harm her.

There was another dream with a dream screen during the psychotherapy process. In this dream her father rescued her from being crushed by a car falling down a hillside. They ran through the snow on a frozen lake. She interpreted the dream as meaning that the way her father reached peace of mind was to freeze and deny all feelings. The therapist said that it had been the patient's own way of coping, too. Until recently she had not had other ways to cope with her own feelings. In the other part of the same dream she was climbing in the company of her sister along the same hillside. They tried to reach the house on the top of the hill. The sister succeeded, but the patient let herself fall down. However, she did not die. She interpreted this part of the dream the dream as meaning that her sister had escaped the difficulties in their childhood and adolescence by moving away with her boyfriend. She herself had in psychotherapy let herself fall down in a symbolic way and she was still alive. Now, she considered the reasons for her difficulties to be that she had not had a normal life as an adolescent because of the divorce of her parents. She wasn't able to separate psychologically from either her mother or her father.

Ms. J began to have spontaneous good moments of her own, when she did not feel any external control. She told the therapist that from the age of twelve she had fears about cameras at home and had hardly been able to retain her sense of reality. These experiences had provoked the feeling of being odd and even mad for the rest of her life. Sometimes she had also thought that there were cameras in the psychotherapy room and that the therapist knew this. She had great difficulties in believing that this was not

the case. Similarly, she also told the therapist about her drinking habits and her desire to be able to control her drinking. Her female friend helped in these efforts. With help from the therapist she gained more self-confidence. On the other hand, she spoke about feeling deeply depressed and worthless.

She had a dream in which she was watching landscape through a window. She interpreted the peaceful view as being a memory of happy childhood before the divorce of her parents. The therapist remembered that she had mentioned before how she often sat in front of the window as a child, and sang to console herself, waiting for her mother to come home. Ms. J reflected that the reason for her problems could also be that she was convinced of her madness and was afraid that it would be revealed to everybody. She thought she could never tell anybody about her fears of cameras, not even the therapist. It was for that reason she could not look other people in the eye. After saying this, she spontaneously looked into the eyes of the therapist and gave a friendly smile.

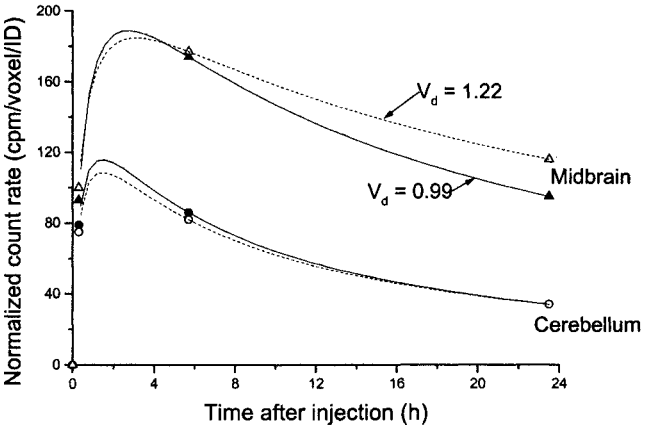
Ms. J now had much better self-esteem and she could trust the therapist and herself more. She tried to understand why her mother and father had not expressed empathy and nurturing towards their children. The grandmother of Ms. J told her that her husband had been violent towards their children. The mother had never spoken about her childhood traumas. Now Ms. J understood her mother better and also felt sorry for her. She was less dependent on her sister's opinions and began to discuss more things with her brother, who was also willing to do so. She found new friends and reflected on the friends' personalities. She was able to accept, although with pain, that her father had recently remarried. The very important moment was when she understood that she was not mad, as she had been afraid of, although she had many traumas in childhood and adolescence.

Changes in Depression Rating Scales and Outcome Variables

At baseline the SCID-I diagnoses of the patient were major depression (296.22) and dysthymia (300.40). Her HRSD score was 17 and MADRAS score 21 points. The patient had a decreased serotonin transporter level at baseline (SERT 0.99 in the midbrain) (Figure 2). Her MRI scan was normal. The mean age of the healthy controls was 26.3 years (20–37 years) and the mean value of SERT in the midbrain was 1.28 (SD $\pm$ 0.12). The SERT binding in the midbrain of the patient at baseline was 2.5 standard deviations (SD) lower than the mean value of SERT binding of the healthy controls.

Figure 2.

TIME ACTIVITY CURVES OF [^{123}I]NOR-β-CIT IN THE CEREBELLUM AND MIDBRAIN AT BASELINE (SOLID) AND ON 1-YEAR FOLLOW-UP (OPEN). THE SPECIFIC BINDING TO MIDBRAIN SEROTONIN TRANSPORTERS INCREASED BY 22% FROM BASELINE TO 1-YEAR FOLLOW-UP.



After twelve months of psychotherapy, the HRSD score was 18 and the MADRAS score 30 points. In SCID-II, features of borderline and obsessive compulsive personality disorder were found, but they did not meet the full diagnostic criteria of either disorder. However, the serotonin transporter level was normalized (SERT 1.22 in the midbrain). The specific binding to midbrain serotonin transporters had increased by 22% from baseline to the one-year follow-up (Figure 2). The difference was two SD higher on 12-month follow-up than at baseline. When the psychotherapy had lasted for 18 months, the depression of the patient was in remission, the HRSD score being six and the MADRAS score 14 points.

DISCUSSION

The dream has been seen as an integrated product of adaptive mind/brain functions and the therapeutic potential of working with dreams is therefore clinically important (Reiser, 2001). The self-esteem of Ms. J was very low at the beginning of psychotherapy, but she was ready to explore her feelings and ways of coping with difficulties in her life. She wanted to know what kind of human being she was. However, for a long time she had ambivalent feelings between the desire to understand and aversion from knowing. In this context, dreams may have provided a psychobiological mechanism for dealing with conflictual life problems (Reiser, 2001).

On 12-month follow-up, SERT binding in the midbrain was normal-

izing and it was also possible to observe in the psychotherapy process an activation of the dream screen in the transference between the patient and the psychotherapist. The impact of the deeper parts of the brain, from the pons and mesencephalon to the limbic structures and hippocampus, is plausible when the instinctual, affective and memory-related dream contents are activated. On the other hand, the formation of mental and dream *imagery,* which is connected with the bodily image and sense of self, is likely to arise through the activation of cortical, especially posterior associative areas. The unconscious dream contents may thus have different and more deeply seated brain mechanisms from the elementary dream consciousness containing the dream images and the dream screen that are likely to prevail on the cortical level (Lehtonen, 2003). The dream screen phenomenon may thus connect unconscious levels of the mind to the cortical formation of dream symbols. The revival of these as yet hypothetical processes during psychotherapy may be assumed to also be related to the normalization of SERT density at the level of the midbrain (raphe nucleus), which is a part of the brain stem regulation of sleep and dream physiology.

During the first year of psychotherapy Ms. J had many omnipotent thoughts. She idealized her father and devalued her mother. She wanted to be perfect in psychotherapy and had fears of appearing stupid. She also feared punishment from the therapist. The activation of the dream screen in adult transference signifies a turning point during the psychotherapy process and psychic growth. According to Hills (Hills, 1999), the dream screen does not only represent a regressive return to the oral phase at moments of conflict. Later developmental phases and their conflicts can also be represented by developmental transformations of these regressive experiences. This was the case with Ms. J. The dream of Ms. J featuring a house on the top of a mountain and peacefully playing children on the mountainside could be seen as a dream with a dream screen. A double cathexis was presented during the same psychotherapy session by the patient's question of whether she could get money for the bus (narcissistic cathexis) and by her immediate remark that she knew very well that the therapist was not her mother (object-related real-person cathexis). The second dream with the dream image of hillside was seen at the moment when the patient was able to let herself fall down in a symbolic way and let go of her omnipotent feelings without fear of dying. She no longer denied her psychological problems. Ms. J now had possibilities to experience moments of her own without feelings of external control and to have her own motives independent of those of other people. She could tell the therapist about her thoughts of cameras and fears of appearing strange and

mad without extreme shame and terror of seeing in the therapist's eyes the confirmation of her destiny. She was very sorry about her childhood traumas but not as depressed as she had been almost all her life before psychotherapy.

The place of psychoanalytic treatments within psychiatry and the integration of psychiatry and neuroscience have been discussed (Gabbard, Gunderson, & Fonagy, 2002; Martin, 2002). An increased openness to diverse theoretical perspectives has characterized the field of psychotherapy research during recent years. However, the valid assessment of connections between the effects of psychotherapy and brain function requires careful exclusion of many confounding factors.

It has been suggested that factors favoring a long-term psychoanalytical approach in the treatment of major depression include a chronic sense of emptiness and a low self-esteem, a history of childhood losses or separations, and the presence of chronic interpersonal conflicts or certain personality disorders (Karasu, 1994). These aspects characterized the personality development of Ms. J. Superego demands may be alleviated by psychotherapy, reducing feelings of guilt and inadequacy and thus allowing self-esteem to be raised. Similar changes were observed in the case of Ms. J.

CONCLUSION

It was interesting to observe that SERT binding in the midbrain was already normalized before the alleviation of depressive symptoms assessed with HRSD and MADRAS. The degree of depression in the Hamilton rating scale has been seen to correlate with the density of presynaptic serotonin transporters in the thalamus-hypothalamus region in patients with Wilson's disease using SPECT imaging (Eggers et al. 2003). We suppose that the increase in SERT binding in the midbrain correlated with recovery from depression in our patient. During psychotherapy Ms. J was able to interpret her dream by herself with the dream screen phenomenon and to use it to aid her psychotherapy process. This may be a sign of developing capacity for emotional attachment and psychic growth.

Acknowledgments: Johannes Lehtonen and Pirjo Irmeli Saarinen received a grant from the Signe and Ane Gyllenberg Foundation, Helsinki, Finland.

REFERENCES

Boyer, L. B. (1960). A hypothesis regarding the time of appearance of dream screen. *International Journal of Psychoanalysis, 41,* 114–122.

Eggers, B., Hermann, W., Barthel, H., Sabri, O., Wagner, A., Hesse, S., et al. (2003). The degree of depression in Hamilton rating scale is correlated with the density of presynaptic serotonin transporters in 23 patients with Wilson's disease. *Journal of Neurology, 250,* 576–580.

Gabbard, G. O. (2001). Empirical evidence and psychotherapy: A growing scientific base. *American Journal of Psychiatry, 158,* 1–3.

Gabbard, G. O., Gunderson, J., & Fonagy, P. (2002). The Place of Psychoanalytic Treatments Within Psychiatry. *Archives of General Psychiatry, 59,* 505–510.

Grasby, P. M. (1999). Imaging strategies in depression. *Journal of Psychopharmacology, 13,* 346–351.

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology Neurosurgery Psychiatry, 23,* 56–62.

Hills, O. F. (1999). Ego Erection: Regressive Perceptual Phenomena in Relation to Psychic Growth. In A. J. Solnit, P. B. Neubauer, S. Abrams, A. S. Dowling (Eds.), *The Psychoanalytic Study of the Child.* (pp. 259–288). New Haven: Yale University Press.

Hiltunen, J., Åkerman, K. K., Kuikka, J. T., Bergström, K. A., Halldin, C., Nikula, T., et al. (1998). Iodine-123 labeled nor-β as a potential tracer for serotonin transporter imaging in the human brain with single-photon emission tomography. *European Journal of Nuclear Medicine, 25,* 19–23.

Kandel, E. R. (1998). A new intellectual framework for psychiatry. *American Journal of Psychiatry, 155,* 457–469.

Karasu, T. B. (1994). The role of individual psychotherapy in the treatment of major depression. *Comprehensive Therapy, 20,* 101–105.

Khan, A., Khan, S., Kolts, R., & Brown, W. A. (2003). Suicide rates in clinical trials of SSRIs, other antidepressants, and placebo: analysis of FDA reports. *The American Journal of Psychiatry, 160,* 790–792.

Kuikka, J. T., Tammela, L., Karhunen, L., Rissanen, A., Bergstrom, K. A., Naukkarinen, H., et al. (2001). Reduced serotonin transporter binding in binge eating women. *Psychopharmacology, 155,* 310–314.

Lehtonen, J. (1997). On the Origins of the Body Ego and Its Implications for Psychotic Vulnerability. In V. D. Volkan and S. Akhtar (Eds.), *The Seed of Madness: Constitution, Environment, and Fantasy in the Organization of the Psychotic Core* (pp. 19–57). Madison, CT: The International Universities Press.

Lehtonen, J. (2002). Origins of Dreaming: Letter to the Editor. *American Journal of Psychiatry, 159,* 495.

Lehtonen, J. (2003). The Dream Between Neuroscience and Psychoanalysis: Has Feeding an Impact on Brain Function and the Capacity to Create Dream Images in Infants? *Psychoanalysis in Europe, Bulletin of the European Psychoanalytical Federation, 57,* 175–183.

Lewin, B. D. (1953). Reconsideration of the Dream Screen. *Psychoanalytical Quarterly, 22,* 174–199.

Malison, R. T., Price, L. H., Berman, R., van Dyck, C. H., Pelton, G. H., Carpenter, L., et al. (1998). Reduced Brain Serotonin Transporter Availability in Major Depression as Measured by [123I]-2 beta-carbomethoxy-3 beta-(4-iodophenyl) tropane and Single Photon Emission Computed Tomography. *Biological Psychiatry, 44,* 1090–1098.

Martin, J. B. (2002). The Integration of Neurology, Psychiatry and Neuroscience in the 21st Century. *American Journal of Psychiatry, 159,* 695–704.

Montgomery, S. A., & Åsberg, M. (1978). A new depression scale designed to be sensitive to change. *British Journal of Psychiatry, 134,* 382–389.

Reiser, M. F. (1997). The art and science of dream interpretation: Isakower revisited. *Journal of American Psychoanalytical Association, 45,* 891–907.

Reiser, M. F. (2001). The dream in contemporary psychiatry. *American Journal of Psychiatry, 158,* 351–359.

Rycroft, C. (1951). A contribution to the study of the dream screen. *International Journal of Psychoanalysis, 32,* 178–184.

Saarinen, P. I. (2003). Dream screen phenomenon in psychotherapy and artistic work. *Nordic Journal of Psychiatry, 57,* 383–388.

Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. B. (1992). The structured clinical interview for DSM-III-R (SCID) I: History, rationale and description. *Archives of General Psychiatry, 49,* 624–629.

Storosum, J., van Zwieten, B. J., van den Brink, W., Gersons, B. P. R., & Broekmans, A. W. (2001). Suicide Risk in Placebo-Controlled Studies of Major Depression. *American Journal of Psychiatry, 158,* 1271–1275.

Viinamäki, H., Kuikka, J., Tiihonen, J., & Lehtonen, J. (1998). Change in monoamine transporter density related to clinical recovery: A case-control study. *Nordic Journal of Psychiatry, 52,* 39–44.