Auricular Treatment of Maternal Depressive Disorders

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ABSTRACT

The birth of a child is one of the greatest moments in the life of a parent. It brings joy, bliss, and exhilaration. However, for a variety of reasons, childbirth may also promote fear and anxiety. In some cases, childbearing can even cause considerable emotional distress that can ruthlessly influence the dynamics of the family. Perinatal depressive disorders are mood disorders that can affect mothers, and are considered one of the most common complications during and after pregnancy. Perinatal depressive disorders can have profound negative effects on personal and family life. These disorders can also have serious childrearing consequences. The auricular acupuncture microsystem has been used for a long time to treat emotional problems in both animals and humans. This system offers a safe approach to treat depressive states without side-effects or complications.

Keywords: pregnancy, mood disorders, auricular therapy, auricular phases, zonal treatment, depression, psychosis

INTRODUCTION

MATERNAL DEPRESSION ENCOMPASSES a group of mood disorders in the perinatal period and up to 12 months postdelivery. In addition to prenatal depression, three mood disorders have been identified following childbirth, namely (1) postpartum blues, (2) postpartum depression (PPD), and (3) postpartum psychosis. Between 0.5% and 60% of all women develop PPD states.¹ Although PPD might be initially diagnosed for the first time during pregnancy, in most cases, this depression evolves from the frequently missed condition of prenatal depression. PPD states are not seen exclusively in mothers, as about 10% of fathers suffer from depression ~3–6 months postdelivery with a positive correlation to maternal depression.^{2,3} Differentiation between these depressive disorders is quintessential for providing the most appropriate intervention, whether this treatment is medical or complementary in nature.

Postpartum Blues

Postpartum blues comprises the most commonly encountered postpartum mood disorder and usually affects somewhere between 50% and 80% of all mothers. Aside from the stress of labor and delivery, the mother generally experiences

a range of emotions associated with the coming of a new baby. Symptoms can include mood instability, sadness, feeling overwhelmed, anxiety, excessive crying, sleep disorder, irritability, and appetite change. Postpartum blues do not tend to interfere with the maternal care of the baby and are usually self-limiting, as symptoms tend to dissipate within a few weeks postdelivery without any treatment.

PPD

About 10%–15% of all mothers can suffer from PPD that develops from weeks to months following delivery.^{1,4} Undiagnosed prenatal depression is a major risk factor for developing PPD. The symptoms of PPD are identical to those of postpartum blues but, tend to be more intense and are usually of longer duration. Additionally, the mother might develop feelings of worthlessness and panic attacks, and might even have recurrent thoughts of self-harming or inflicting harm to her baby. Mothers can have thoughts of death and can experience suicidal ideation. PPD is also characterized by exceeding difficulties in bonding with the newborn, overwhelming fatigue, excessive anger, and inability to concentrate or make appropriate decisions.

Postpartum Psychosis

Afflicting only 1–2 per 1000 women, postpartum psychosis is the most serious of the mood disorders but is the least common of all the postpartum mood disorders. Coinciding with the hormonal shift following childbirth, this psychosis develops anywhere between 2 days to 4 weeks postdelivery. The risk is usually higher in women known to have suffered from schizophrenia or bipolar disorder. Risk is also known to be higher in women with previous history of postpartum psychosis. Postpartum psychosis is characterized by paranoia, delusions, hallucinations, confusion, disorientation, insomnia, and attempts to self-harm or induce harm to the newborn. Because of the intensity and the seriousness of the symptoms, treatment should be established quickly.^{5–9}

PATHOGENESIS

The possible etiology of depression is a rather complex one. Although chemical imbalance is a significant factor, the brain neurotransmitters are not the sole culprits. The combination of genetic predisposition, faulty mood regulation, stressful events, medications, and medical illnesses can all interact to promote depression.¹⁰ Sudden changes in hormonal balance immediately postdelivery appears to have a great impact on the development of postpartum mood disorders. Estrogen, progesterone, thyroid hormone, testosterone, corticotropin-releasing hormone, and cortisol have all been implicated as possible etiologic factors. Hormones and neurotransmitters share not only a common pathway, but also receptors' sites, especially through the hypothalamic–pituitary–gonadal axis that influences mood. Thus, hormonal fluctuations during any of the reproductive events will tend to have a greater impact on women, putting them at higher risk for developing depression in comparison to men.¹¹ While researchers caution about the administration of synthetic progesterone as a treatment for perinatal depressive disorders, administration of estrogen appears to be of modest value for treating PPD.¹²

Both anatomical and functional abnormalities have been identified in the limbic system in patients with depressive disorders. Nerve growth and the formation of new nerve connections appear to play an imperative role in this disorder. Postpartum studies in patients diagnosed with major depressive disorders (MDDs), and other research projects, revealed that the emotional parts of the thalamus showed a 30% greater-than-average number of nerve cells.¹³ Other studies identified a larger-than-normal thalamus in patients with MDDs.¹⁴ In depressive states, as well as in many psychiatric disorders, the hippocampus undergoes atrophy with decreased dendritic branching.¹⁵

BRAIN STRUCTURES INVOLVED

Recent functional magnetic resonance imaging studies implicate many structures in the limbic system in the

development of depression. The frontal lobe and particularly the prefrontal cortex, the basal ganglia, the amygdala, the thalamus, the hippocampus, and the cingulate gyrus appear to be involved.¹⁶ The amygdala and the hippocampus are responsible for the identification of stressful situations and, consequently, determine the appropriate responses. There is evidence that a linkage exists between gonadal hormones and catecholamine metabolism, as a part the hormonal changes seen during pregnancy and in the postpartum period.¹⁷ Animal research, by Bradbury et al., in 1985, suggest that melatonin, produced by the pineal gland, is involved in the regulation of the activity of limbic dopaminergic functions that have been implicated in the pathogenesis of psychosis.¹⁸

Frontal Brain

The frontal brain—and the medial prefrontal cortex in particular—is one of the significant brain structures involved in the development of postpartum depression. Increased glutamate levels have been identified in the prefrontal cortex of mothers suffering from PPD.

Cingulate Gyrus

The cingulate gyrus appears to play a major role in depressive disorders by enabling the individual to see the various options available. The cingulate gyrus is also essential for the feeling of being secure and protected. Its dysfunction does not allow adaptation or flexibility. Thoughts become repetitive and compulsive, leading to negative feelings. The cingulate gyrus appears to play an important part in preventing depression by turning off negative thoughts recognized by the amygdala.¹⁹

Thalamus

As part of the limbic system, the thalamus is heavily involved in emotional control. It serves as a relay center for information received from sensory receptors in various parts of the body before being directed to the amygdala, and the overlying cerebral cortex.

Amygdala

The amygdala is an integrative center for emotions and its dysfunction is associated with anxiety, sorrow, anger, fear, and sexual arousal. It receives visceral input from the various senses. The amygdala facilitates learning and stores information about emotional events. Emotionally charged memories, sadness, and depression thrust the activation of the amygdala. Functional disturbance of the amygdala is associated with various psychiatric disorders, including depression, schizophrenia, autism, panic disorder, anxiety disorder, and post-traumatic stress disorder. As an integral part of the limbic system, the amygdala has many connections to different brain structures. Through its connections

to the frontal brain, it is indispensable in regulating the emotional responses and the affective behavior of the individual. Through its neural connection to the ventral tegmental area, the amygdala exerts considerable influence in activating many neurotransmitters such as dopamine and noradrenaline. Additionally, its connection to the thalamus influences the activity of the autonomic nervous system.

Hippocampus

The hippocampus plays an imperative role in memory retention. This brain structure is responsible for converting short-term memories into long-term memories. Studies suggest that recurrent depressive states, and repetitive exposure to stress hormones, might hamper the growth of the nerve cells in the hippocampus, leading to a diminution of its size.

Basal Ganglia

The basal ganglia consist of the caudate nucleus, putamen, globus pallidus, substantia nigra, nucleus accumbens, and subthalamus. Many connections, both functional and anatomical, exist between the basal ganglia and the various structures of the limbic system to regulate emotions. Abnormalities in the basal ganglia–thalamo–cortical connections have been identified in MDDs.²⁰ In depressive states, data have pointed to decreased volume, hypometabolism, and reduced blood flow in the frontal lobes, basal ganglia, and medial temporal structures. Research has shown that left putamen volumes correlated inversely with length of depression and left globus pallidus volume correlated directly with the number of prior depressive episodes.²¹ Research has shown that the basal ganglia are also involved in the pathogenesis of postnatal depressive psychosis.²²

Temporal Cortex

In 2015, Nenadic et al. identified the left superior temporal cortex as a proven culprit involved in the development of psychosis.²²

WESTERN MANAGEMENT APPROACHES

In Western management approaches, psychotherapy is advocated for treating mild-to-moderate cases of postpartum depressive disorders. Pharmacotherapy is most suited for moderate-to-severe cases. While meta-analysis results support the effectiveness of psychologic and psychosocial interventional treatment options for PPD disorders, the long-term effectiveness of these approaches remains ambiguous.²³ The medicinal effect of antidepressants and antipsychotic medications are of major concern to breastfeeding mothers. Many of these drugs appear in the breast milk and, accordingly, find their way to the breastfed baby.

Currently, there are no established research data about the long-term effects of pharmacotherapy. Review of available studies casts doubts on the effectiveness and benefits of antidepressants beyond 8 weeks. There is also inadequate evidence about the adverse effects of antidepressants, whether in the short- or long-term, on breastfeeding infants.²⁴ In women suffering from postpartum psychosis, antipsychotic medications and mood-stabilizing drugs, such as lithium, are indicated. Electroconvulsive therapy could be of value when pharmacotherapy fails to control the symptoms.²⁵

AURICULAR TREATMENT

The auricular acupuncture microsystem can be of great value as a complementary approach for managing perinatal depressive disorders. It might be of even greater usefulness in patients whose conditions are not responding adequately to antidepressants or for patients who suffer considerable medicinal side-effects. Auricular treatment can be administered as a sole form of acupuncture intervention or in combination with other acupuncture disciplines.

The auricular homunculus provides unmatched clear and precise somatotopic presentations for the various brain structures known to be involved in perinatal mood disorders. Treatment of these projection sites may help alleviate many of the symptoms of postpartum blues and postpartum depression. Given that prenatal depression is a risk factor for the development of postpartum mood disorders, auricular treatment should be earnestly considered to address prenatal depression.

Zonal Treatment

The earliest publications of Paul F.M. Nogier, MD, presented the auricular somatotopy of the various organs and structures in the form of auricular points. This somatotopy was adopted quickly by the Chinese, who added a few supplementary auricular points. The Chinese auricular charts have remained unchanged for the past 60 years. However, following the initial discovery, Dr. Nogier and his colleagues continued their studies and were able to enhance the auricular system further. It was evident that the projections of the various organs and structures were actually in the form of zones, and not points. In his book, *From Auriculotherapy to Auriculomedicine*, Dr. Nogier presents this modified auricular somatotopy clearly.²⁶ Further studies have shown that such zonal presentation is dynamic in nature, and not fixed. In his book, *Elements of Auriculotherapy*,²⁷ Rene J. Bourdiol, MD—who worked relentlessly with Dr. Nogier to map the ear—indicates that localizations of organs were never found to be the same when examined at different times. This was always the case even in the same individual. The size of the auricular localizations varied considerably in relation to their energetic activities.²⁷

Dr. Nogier and his colleagues eventually mapped the majority of the brain structures identified on the lobule of the ear and the tragus. Further discoveries identified the 3 auricular phases. Each organ and structure, depending on the extent of the pathology, could be identified in 3 different auricular localizations.^{26,28}

Auricular zonal-projection sites are known to be electrically silent, as long as the corresponding organ or structure is energetically stable. Energetic or pathologic disturbances in any organ or structure are reflected as disturbed energetic activity within the corresponding auricular zone. The abnormal energetic activities tend to converge to form a specific electrically active point within the zonal presentation that must be addressed in order to help correct the energetic or pathologic disturbances. Once identified, using an electrical point finder, appropriate treatment should be established.^{26,28}

Auricular Phases

Dr. Nogier identified 3 projection arrangements for the ear homunculus.²⁶ The 3 phases, as they were designated, correspond to the commonly known 3 stages of disease. Phase 1 on the auricle corresponds to the anatomical somatotopic presentation on the cerebral cortex and reflects the normal physiologic status of the human body. Phase 1 also corresponds to organs and structures suffering from energetic disturbances prior to the appearance of any symptoms. Additionally, Phase 1 projects organs and structures with established pathologic conditions that are acute in nature. It is projected onto the ear in the well-known inverted-fetus presentation (Fig. 1).^{26,28}

Phase 2 projects organs and structures with chronic inflammatory conditions associated with tissue destruction. It is also energetic in nature and not anatomical. It is projected onto the ear in an upright manner. It is normally described as the standing-person presentation. (Fig. 2).^{26,28}

FIG. 1. Phase 1: Inverted-fetus projection.

FIG. 2. Phase 2: Standing-person projection.

Phase 3 projects organs and structures suffering from chronic inflammatory conditions, but lacking any evidence of tissue damage. Phase 3 is energetic in nature and not anatomical. It is projected onto the ear in a transverse manner (Fig. 3). Phase 3 is normally referred to as the transverse-person presentation.

PERINATAL-DEPRESSION MANAGEMENT

Treatment of auricular-projection sites of the brain structures in Phase 1 is appropriate for all types of perinatal mood disorders, regardless of duration and severity. In postpartum psychosis or in severe PPD states, phase 2 of the brain auricular somatotopy must be evaluated and treated if active. In advanced depressive states, however, additional treatment of the same brain structures in their presentation in Phase 3 might be needed.

FIG. 3. Phase 3: Transverse-person projection.

FIG. 4. Depression Treatment Zones for Phase 1.

TREATMENT IN PHASE 1

The projection sites of the brain structure involved in depressive disorders in Phase 1 are found on the lobule of the ear (Fig. 4).^{26,28} The frontal brain can be recognized on the lobule along its anterior, as well as on the inferior free border. The projection site of the thalamus is identified onto the anterior two-thirds of the external surface of the antitragus and that of the amygdala, as identified by the current author in 2005, is found along the free border of the lobule slightly posterior to the projection site of the frontal brain.²⁹ The basal ganglia are projected onto the posterior part of the lobule close to the inferior end of the scaphoid fossa.

The cingulate gyrus is projected onto the external surface of the lobule immediately below the intertragal notch. The projection site of the hippocampus can be identified immediately below that of the cingulate gyrus. The projection site of the pineal gland is identified at the lower part of the external surface of the tragus, as it joins the lobule of the ear. The projection site of the temporal cortex in Phase 1 is recognized on the lobule, along its inferior free border immediately posterior to that of the amygdala. The adrenal cortex is projected onto the inferior border of the body of the antihelix, just below the apex of the triangular fossa.

Treatment in Phase 2

In Phase 2, most of the brain structures involved in depressive states are projected onto the upper one-third of the ear (Fig. 5). The prefrontal lobe is identified in the upper part of the scaphoid fossa, just in front of the Darwin's tubercle, while the frontal cortex is projected on the inner surface of the helix, just above the Darwin's tubercle. The thalamus in Phase 2 is projected onto the antihelix at the beginning of the superior crus. The projection extends anteriorly to include the apex of the triangular fossa, an area normally referred to as *Shen Men*, and posteriorly to include the adjacent part of the scaphoid fossa. In 2005, the current author identified the projection sites of the basal ganglia, cingulate gyrus, and amygdala in Phase 2. The projection

FIG. 5. Depression Treatment Zones for Phase 2

site of the amygdala in Phase 2 is recognized on the undersurface of the helix, just posterior to the apex of the ear. The projection site of the basal ganglia in Phase 2 is identified at the apex of the triangular fossa. The cingulate gyrus is also projected onto the apex of the triangular fossa, immediately above the projection site of the basal ganglia in the same phase. In this phase, the basal ganglia and the cingulate gyrus overlap the most commonly recognized site of the popular *Shen Men* point.

The projection site of the hippocampus in Phase 2 can be identified at the center of the triangular fossa. This projection site also extends superiorly and anteriorly toward the base of the triangular fossa. The pineal gland is projected onto the scaphoid fossa at the level of the projection site of the third cervical vertebra. The temporal cortex in Phase 2 is projected onto the inner surface of the helix at the highest point of the ear and immediately in front of the projection site of the amygdala in the same phase. The adrenal cortex in Phase 2 is projected onto the ascending branch of the helix just anterior to the Zero zone (Fig. 5).

Treatment in Phase 3

In Phase 3, all the brain structures are projected onto the concha of the ear (Fig. 6).^{26,27} The projection site of the frontal brain is identified at the most anterior part of the upper

FIG. 6. Depression Treatment Zones for Phase 3.

FIG. 7. Aiguille Semi-Permanente® needle. Permission received for publication of this photo by John Howard.

concha, while that of the thalamus is identified on the lower conchal wall and extends to the adjacent interior surface of the antitragus directly opposite the projection site of the thalamus in Phase 1. In 2005, the current author identified the projection sites of the basal ganglia, the cingulate gyrus, and the amygdala in Phase 3.²⁹ The projection site of the amygdala is found on the upper concha posterior to the projection site of the frontal brain in the same phase. The amygdala's Phase 3 projection site partially overlaps the Zero zone area. This projection site also extends upward and posteriorly to end close to the antihelix.²⁹ The projection site of the basal ganglia on the conchal surface of the antitragus is directly opposite its projection site in Phase 1. The cingulate gyrus in Phase 3 is found at the location usually known as the Zero zone.²⁹

The projection site of the hippocampus is identified at the most superior and anterior part of the lower concha in close relationship to the upper end of the external auditory meatus. The hippocampus is projected anterior and inferior to the Zero zone. The projection site of the pineal gland is found on the anterior surface of the ascending branch of the helix at the level of the most upper part of the tragus. The projection site of the temporal lobe in Phase 3 is recognized in the upper part of the superior concha posterior to the projection site of the amygdala and in close relation to the antihelix. The adrenal cortex is projected onto the lower part of the tragus, prior to its junction with the lobule of the ear.

FIG. 8. Seirin® Spinex™ intradermal needle. Permission received for publication of this photo by Lhasa OMS.

FIG. 9. Nogier auricular electrical frequency zone.

Treatment Modalities

Treatment modalities include the use of needles (temporary or semipermanent needles), electrical treatment, laser treatment, magnets, or beads. Temporary needling and electrical or laser treatment should be performed several times weekly, depending on the severity of the depression. This might, however, be inconvenient to a mother who is taking care of her baby and simultaneously dealing with depression.

Semipermanent needles—such as Aiguille Semi-Permanente® (ASP®) or Seirin® Spinex™ intradermal needles—could comprise an equitable alternative. ASP needles, while very effective, can only be retained for a few days and may carry the risk of injuring the ear cartilage, if not inserted appropriately (Fig. 7). Spinex needles, however, can be left in place for weeks at a time (Fig. 8). Accordingly, Spinex needles are more convenient and, because they are inserted tangentially under the skin, the chance of penetrating the cartilaginous part of the ear is very slim.

Electrical or laser treatment, if used, should provide the inherent frequency of the points being addressed (Fig 9). The inherent electrical frequency for the cingulate gyrus, hippocampus, and frontal brain is 160 Hz (the inherent laser frequency is 146 Hz). The thalamus, basal ganglia, temporal lobe, and amygdala have an inherent electrical frequency of 80 Hz (the inherent laser frequency is 73 Hz). The inherent electrical frequency of the pineal gland is 20 Hz (the inherent laser frequency is 2,336 Hz). The inherent electrical frequency of the adrenal cortex is 10 Hz (the inherent laser frequency is 1168 Hz)^{26,28} The inherent frequency for any structure, whether it is laser or electrical, is always the same regardless of phase projection.

Placement of appropriate magnets, seeds, or beads in the electrically active points can be used in place of the above approaches, and these items can be retained in place for prolonged periods of time.

DISCUSSION

Postpartum depression is a serious medical problem that has been recognized since the time of Hippocrates, who

described a state of restlessness and delirium in a woman following the birth of her twins.³⁰ Apart from the deleterious effects on the mother, PPD has been found to be associated with long-term impairment of child performance.³¹ In 1 study, children born to mothers suffering from PPD performed significantly lower on cognitive tasks at 18 months of age, compared to children born to mothers who did not suffer from PPD.³²

Many studies attest to the efficacy of auricular acupuncture treatment of many neuropsychiatric disorders. A study by Wang and Kain showed the beneficial effect of auricular treatment of anxiety.³³ A study by de Lorent et al. also suggested that auricular acupuncture is effective for treating MDD.³⁴ A study by Kuo et al. supported the value of auricular acupressure for relieving anxiety and fatigue as well as reducing the cortisol levels in post-cesarean section women.³⁵

In prenatal depression, the auricular acupuncture microsystem could provide a much-needed safe and simple approach to possibly eradicate this condition, which can eventually lead to PPD. Psychotherapy intervention is known to be appropriate for mild-to-moderate cases of PPD. Although pharmacologic intervention is more appropriate for moderate-to-severe conditions, its effectiveness and possible serious side-effects hamper their use. In all types of PPD states, intervention, utilizing the auricular acupuncture microsystem could be an important complementary approach free of any medicinal complications.

CONCLUSIONS

The auricular acupuncture microsystem offers a sophisticated complementary acupuncture approach for addressing all types of PPD. The auricular acupuncture microsystem is essentially a reflection and a replica of the brain's memory pattern pertaining to the anatomy as well as the energetic status of the various organs and structures. Compared to body acupuncture, the auricular acupuncture microsystem uniquely offers an updated approach for treating PPD beyond the capability of any other acupuncture discipline. With the auricular acupuncture microsystem's unique and specific somatotopic presentation of the various brain structures involved—and through its multiphase system—this is an unmatched acupuncture approach for treating many medical problems, including prenatal depression and PPD states.

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