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CONTINUITY AND INDIVISIBILITY OF INTEGRATED PSYCHOLOGICAL, SPIRITUAL AND SOMATIC LIFE PROCESSES

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Abstract
The continuum of life begins *in utero*. It is not possible to separate any stages of human development from the rest of an individual life's continuum. The life continuum is one of the basic needs in human life in order to maintain homeostasis and equilibrium.

Since the vulnerability of an organism is greatest in a developing phase, already the prenatal phase of human life gives opportunities to influence later stages of human life in a positive way. Fundamental processes of life, such as reproduction, metabolism, information processing and immune responsiveness, are controlled by the neuro-endocrine-immune system. Integrated Psychoimmuno-Neuroendocrinology represents a unique opportunity for primary prevention of psychological, emotional and physical disorders.

Key words: *integrated neurosciences – continuity – indivisibility – psychosomatic model*

REVIEW

CONTINUUM

The human life has to be considered as an indivisible continuum, where each of the developmental stages is equally important, all stages interdependent and not separable from the whole individual life's continuum. In this *continuum*, the individual represents an indivisible entity of all functions on both physiological or physical psychological and social level. The physical, biochemical, endocrinological and psychological processes represent a whole that can not be divided.

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The disturbance of individual life continuum on a momentous scale would lead to illness or in the extreme cases, where homeostasis can not be regained, death is the result. Any discontinuity from outside or from inside the individual organism will violate these basic biological and psychological needs, both on prenatal and postnatal life. Discontinuity has increasingly become a more serious problem today, causing the spread of ecological, social and political disturbances throughout the world.

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No group of people or any nation is wholly immune from the upheaval of disorienting developments on ecological and social levels. In the field of prenatal and perinatal psychology and medicine, we are very much aware of the dangers that discontinuity can generate in the unborn and in the newborn.

We place great emphasis on the interdisciplinary character of science and practice, which enables different scientific specialties such as medicine, psychology, psychoanalysis, anthropology, human ethology, sociology, philosophy and others to meet, find a common language and go through the process of a mutually creative influence or, as it were, a "cross fertilization".

Prenatal and perinatal psychology and medicine can also serve as a "psychosomatic" model stressing the indivisibility of "psychological" and "physical" processes in the continuum of human life from its very beginning, emphasizing also the indivisible development of all functions of the central nervous system and the immunological and neuroendocrinological processes.

The intrauterine experience is also a learning process for the child. This learning is a vital prerequisite for survival since enables for the organism to adapt itself to new circumstances. Without adaptation there would be no survival – as one cannot adapt without making and having had experiences upon which to base the adaptation. Such a process requires memory, whether consciously retained or subconsciously imprinted. The information processing, which reaches the child from the very beginning of its development, is received via the different biochemical pathways and then transformed and stored as memory traces (this could eventually be useful to a theoretical understanding of certain psychotherapeutical procedures such as hypnosis, dream analyses, prenatal memories, etc.) (Fedor-Freybergh 1983, 1987, 1988a, b, c, 1990a).

PREVENTION

The above statements give the prenatal stage of life a unique position in the course of human development, where primary prevention is possible and preventive procedures can be developed.

An organism in its development with all its functions and developing structures reveals an enormous vulnerability towards all kinds of influences. This vulnerability and the reactions to the different influences from outside and inside, is dependent on the "time factor", which means that the developmental processes that are in *"statu nascendi"* are more in danger the earlier in the development negative influences occur.

During critical developmental periods of the neuro-endocrine-immune system, neurotransmitters, hormones and cytokines, when occurring in unphysiological concentrations, and various toxic agents, can be effective as endogenous mal-organizers i.e. "as endogenous teratogens" and result in life-long functional disturbances and diseases. Thus a field known as "functional teratology" emerged.

In this scenario we also see the whole issue of ageing, which starts in this continuum already from the very beginning of human life, and consequently already there exist primary possibilities for preventive measures. The ageing as such does not start in a particular moment. Both ageing of brain and other organs are dependent on the status of immunological, neuroendocrinological, psychological, social, etc. properties and qualities, which develop in a continuum. Since the vulnerability of an organism is greatest in a developing phase, already the prenatal phase of human life gives opportunities to influence later stages of human life in a positive way.

The bridge between the immune system, neuroendocrinology and the rest of the central nervous system opens the gateway to more common understanding and acceptance across the disciplines. It is an umbrella for the endeavor that unites various scientific fields in their attempt to elucidate the processes of experience involved from the earliest stages of human life.

Fundamental processes of life, such as reproduction, metabolism, information processing and immune responsiveness, are controlled by the neuro-endocrine-immune system. The brain is a central nervous controller and neurotransmitters, systemic hormones and hormone-like mediators of immune cells are chemical messengers in this complex system.

Prenatal stress, maternal depression, maternal separation, hormonal deviations, immunology disorders, infections of various characters, and environmental influences have impact on the fetal brain and its differentiation in neurotransmitter level and/or neuro-endocrine development, disturbances and predispositions. Thus, the prenatal stages of life represent a unique opportunity for the primary prevention of psychological, emotional and physical disorders in later life. At this stage we can also develop preventive procedures to decrease premature birth and perinatal morbidity and mortality. We also can influence the destiny of the psycho-neuroendocrinological and psychoneuroimmunological health during the individual's entire life (Fedor-Freybergh 1990b, 1992, 1993).

INTEGRATION

This integration crosses over different disciplines of science and practice, and concerns theoretical and applied fields, basic research and clinical experience throughout the whole continuity of human life from conception and onwards. Integrated Psychoimmuno-Neuroendocrinology represents a unique opportunity for primary prevention of psychological, emotional and physical disorders.

The transdisciplinary and integrative aspect of sciences and their entree in the twenty-first century is the true vision for our common efforts.

In order to undertake such a challenge, a new scientific theory and a common language is required, a language that would be understood across disciplines and would be able to assist in getting beyond semantic problems. In order to reach that, a harmony between different views and approaches, between different methods and methodologies, different theories and practices is needed.

For developing all those visions above, there was a need for a basic tool. There was a need for one or more scientific journals that would reflect both the interdisciplinarity, transdisciplinarity, and the principle of integration, and still meet all demands of high scientific quality and integrity. In 1989 we started publishing the Int. Journal of Prenatal and Perinatal Psychology and Medicine, which addresses the topics of the prenatal and perinatal conditions of both mother and prenatal child, to a large spectrum of professionals, such as – obstetricians and gynecologists, pediatricians, psychologists, psychotherapists, psychoanalysts, psychiatrists and child psychiatrists, neurologists, geneticists, embryologists, midwives, etc., on one side, and social workers, child birth educators, teachers, anthropologists, human ethologists, philosophers, writers and poets, theologists, etc, on the other side.

This broad spectrum of topics and distinguished experts from all the above fields on a large international basis, proved to be a creative and integrating instrument for cooperation, common understanding and mutual enrichment.

The second journal, Neuroendocrinology Letters, was further developed by us in 1999 to a meeting point for neurosciences, including neuroendocrinology, psycho-neuro-immunology, reproductive medicine, chronobiology and other disciplines from the basic and clinical research (Fedor-Freybergh 1994, 1999a, b, 2000, 2002).

We succeeded even with the integration between those two journals (Int. J. of Prenatal Perinatal Psychology Medicine on one hand, and Neuroendocrinology Letters on the other), where mutual publications were possible, and as we will see from the segments below, the themes from the prenatal and perinatal development crossed over to issues of immunology, neuroendocrinology, neurobiochemistry and other disciplines within neurosciences.

The following examples are taken from the Neuroendocrinology Letters and illustrate this integrative approach by different outstanding scientists from Italy, Switzerland, Israel, Russia, Belgium and USA.

"Depression is accompanied by an inflammatory reaction as indicated by an increased production of pro-inflammatory cytokines, such as interleukin-1β (IL-1β), IL-6, tumor necrosis factor-α (TNF-α) and interferon-γ (IFN)-γ. These cytokines are stress-sensitive and may cause depressive behaviors.

Newly developed animal models of depression are based on induced inflammation. Most if not all antidepressants

have specific anti-inflammatory effects. Anti-inflammatory compounds may augment the clinical efficacy of antidepressants.

There is now evidence, that inflammatory pathways play an important role in the pathophysiology of depression. Multiple inflammatory biomarkers have been detected in depression.

The knowledge that depression may occur following external stressors (psychological stressors) and internal stressors (during medical illness or conditions, such as the puerperium) has gained the status of a textbook truism. Early life experiences increase the vulnerability to develop depression, while negative life events often precede depression. In experimental animals, it has been shown that early life stress, e.g. social isolation, and late-life stress models, e.g. CMS, induce inflammation with increased IL-1β and IL-6 in the peripheral blood and in the brain as well. Also, in humans it has been shown that external stressors induce the production of pro-inflammatory cytokines, such as IFNγ and TNFα, and that stress-induced depression/anxiety is related to an increased IFNγ response.

The cytokine hypothesis is also fueled by the increased incidence of depression in the postpartum period and by the high comorbidity of depression with inflammatory disorders, such as multiple sclerosis (MS), coronary-heart disorder, dementia Alzheimer's type, HIV-infection, inflammatory bowel disease and rheumatoid arthritis.

In the early puerperium, there are significant correlations between the magnitude of inflammation, on the one hand, and depressive and anxiety symptoms, lower plasma tryptophan and IDO activation, on the other.

In medical inflammatory disorders there is a correlation between inflammation and the incidence of depression. For example, in MS increases in IFNγ production precede the development of depressive episodes.

The cytokine hypothesis is further corroborated by the findings that antidepressants have anti-inflammatory effects. Thus, most if not all antidepressants have anti-inflammatory effects since they decrease the production of IFNγ and/or increase that of IL-10, a major negative immunoregulatory cytokine. Inflammation is also accompanied by increased oxidative and nitrosative stress (O&NS)" (Maes 2008).

Michael Maes concludes his paper with the cytokine theory of depression, and hypothesizes, among others, that

- depression results from an increased production of pro-inflammatory cytokines, which may be triggered by external or internal stressors; and that
- inflammation may induce depressive symptoms through different pathways, such as central neuroinflammation, tryptophan degradation and an increased synthesis of neurotoxic TRYCATs (tryptophan catabolites along the indoleamine oxidase pathway).

"With the advances in the knowledge of neuroimmunomodulation, a new era of investigations about the chemical basis of the state of mind has been initiated. Both emotions and states of spiritual consciousness may influence immune functions and cancer growth. Stress, anxiety and depressive states are associated with immuno-suppression and enhanced frequency of tumors. On the other hand, the states of sexual pleasure and spiritual joy enhance the immune efficacy, by counteracting tumor onset and dissemination. The biochemistry of pleasure and immunostimulation is mainly mediated by pineal indoles and cannabinergic substances, whereas that of stress, anxiety and depression is associated with enhanced production of adrenal steroids, opioids and catecholamines. The sexual repression would allow a progressive immunosuppression through a profound damage in the biochemistry of pleasure. Therefore, a better definition of psychospiritual status-associated neuroimmunochemistry could allow us to improve the immune dysfunction by acting on the same neuroendocrine secretions which are involved in mediating the psychic influence on the immunity, including that against cancer.

It is fundamental to understand that neurohormone-psyche interaction is active in a bi-directional way, since each psychic condition is characterized by a secretion of specific neuroactive substances, while on the other hand each neurohormone or psychoactive substance may induce particular immunobiological and psychic effects. In addition, it is essential to understand that

the influence of the mind on immune system and cancer growth does not depend entirely on emotions and other psychological events, since consciousness and thoughts may be also active in influencing the immunobiological homeostasis. Therefore, the word psycho-spiritual state would seem to be more adequate than that of the psychic state alone.

At the time of the beginning of Psychoanalysis, it was not possible to postulate a chemical mediation of emotions and consciousness states, because of the lack of many neurochemical knowledge. In any case, Freud never did exclude a possible biological mediation of the psychological life.

Despite the great and complex variety of neurohormones and neuropeptides, from a psychospiritual point of view they may be classified according to archetypic criteria, consisting of Light and Dark ontological aspects, the so-called Hebraic terms of Hahòr and Hahoshék of Biblical memory, respectively. Pain, depression, anxiety, lack of pleasure and absence of joy represent the state of Dark, whereas pleasure and spiritual joy are the effects of the state of Light. It is possible to affirm that the Dark states of mind (pain, depression, anxiety) induce immunosuppression and stimulate cancer development, whereas the Light states (spiritual joy and sexual pleasure) determine immunostimulation and inhibition of cancer cell proliferation.

Psychological epidemiology has demonstrated an association between depression, chronic stress and cancer frequency and progression, whereas spiritual joy and sexual pleasure would prevent cancer onset" (Lissoni et al. 2001).

Lissoni concludes his paper with the statement that "on the basis of the absolute unity between neurobiochemistry and states of mind, future Medicine will consist of the reconstitution of the perfect neuroimmunobiochemistry of the biopsychic status of health."

"In his three papers published both in the Neuroendocrinology Letters and in the Int. Journal of Prenatal and Perinatal Psychology and Medicine, Professor George Stefano, with his coworkers, describes Love as a complex neurobiological phenomenon, relying on trust, belief, pleasure and reward activities within the brain, i.e. limbic processes. Love, pleasure and lust have a stress-reducing and health-promoting potential, since they carry the ability to heal or facilitate beneficial motivation and behavior. In spite of that love is rarely investigated by scientific means.

Love has been the domain of poets and artists, partly psychologists and clinicians, but has certainly not been considered to be right within the scope of common experimental science, i.e. neurobiology research. Emotions and feelings such as attachment, couple and parental bonding and even love have now come into the focus of neuroscientific research in order to elucidate their biological mechanisms and pathways. Love encompasses wellness and feelings of wellbeing, a holistic and integrative medical procedure" (Esch and Stefano 2005a, b, Stefano and Esch 2005).

CONCLUSION

In our journals we always supported and stressed comprehensive and interdisciplinary approach to both research and practice within various fields of science and practice, integrating different views and approaches by means of "cross-fertilization". Furthermore, from the very beginning we emphasized also integration between science and art, where the language of mind meets the language of heart.

Thus, the interdisciplinary direction and character in our journals is not a marriage by necessity, but proves to be valuable and viable as a model for interpretation of scientific results and clinical studies that meets the evidence based criteria in research as well as in good clinical practice.

Continuity and indivisibility of integrated psychological, spiritual, and somatic life processes – as a basic philosophy – demands not more and not less than a sound understanding between the intellectual and emotional capacities of an intelligent mind.

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