

A possible molecular biological approach of the “psycho-neuro-endocrino-immunal axis” via the hypothalamus

Simon, Lehel

University of Debrecen, Hungary

Abstract:

All this is just a hypothesis but can be proved simply in the long run: if the attack points of cytokines in the central nervous system are switched off, it can be exactly and significantly examined whether the total immune effect changes or not, or is it only the fever that decreases, if, e.g., alpha interferon is administered.

If immunological tests can detect really significant differences, we have found the central switchboard of the psycho-neuro-endocrino-immunological axis, which is the supreme control principle in psychosomatics itself.

KEYWORDS: neuroimmunology, hypothalamus, psychosomata sciences, neuroendocrinology

In oncology, it has been established that, in daily practice, patients in a better mental condition have a greater chance for survival, the prevention of metastases¹ – but according to Evidence Based Medicine it has not been justified so far.

Similarly, in the case of HIV infections, good psychoimmunological status is indispensable for survival. This is also evident now but has not been proved yet².

Patients with autoimmune diseases have been shown to produce fewer antibodies if their mental status is good enough³.

¹ See CMDT: Current Medical Diagnosis and Treatment, 2007, Forty-Sixth edition, by The McGraw Companies, Editors: Stephen J. McPhee, MD (University of California, San Francisco, Maxine A. Papadakis, MD (University of California, San Francisco), Editor in Chief: Lawrence M. Tierney, Jr., MD (University of California, San Francisco, Veterans Affairs Medical Center, San Francisco), pp. 775-779.

² CMDT, pp. 775-780.

³ CMDT, pp. 775-776.

In these three groups of diseases FUO (fever of unknown origin) occurs commonly⁴. In each case, strong pyretic cytokine production is thought to be the cause, which is related to increased or altered autoimmunity⁵. In patients with progressed AIDS it manifests itself by the formation of lymphomas, in cancers autoantibody intolerance is decrease⁶ while in autoimmune diseases the number of autoantibodies increases to a pathological degree. These three different groups of diseases were chosen on purpose because at this point they overlap one another in many respects and, also, because they are used as parabolic examples in the hypothetical reasoning to come.

In the previous chapter it was neuroendocrinologically shown that opiates block the center of thermoregulation, degrade its thermocontrol effect and weaken its blood supplying function. That is, based on the previous neuroendocrinological hypothesis, continuous and permanent administration of a powerful V3 receptor antagonist can turn down the activity of the center of thermoregulation. We also know that vasopressin activity can change the whole system in a basically physiologically way, via momentary psychological influence determined by psychological-strategic effects. At the same time, the resulting endorphin dominance re-generates the V3 receptoragonism, so – probably – this is a sustainable process, via medication, if necessary.

Although not for a wide range of purposes, but it can definitely be used to subdue certain symptoms of the central nervous system when applied together with cytokine therapies, fever being one of such symptoms. As a result, cytokine therapy itself becomes more tolerable and easier to dose, the patients' compliance also being better. Therefore interferon-alpha could be used more effectively in a range of diseases such as hairy cell leukaemia, chronic myeloid leukaemia, Kaposi's sarcoma, and chronic active hepatitis B and C⁷. On the other hand, interferon beta could be effectively used in sclerosis multiplex while interferon gamma could be administered in hope for a

⁴ CMDT, pp. 22-23.

⁵ See ibid

⁶ CMDT, pp.684-697.

⁷ CMDT, p.782.

better effect in chronic granulomatous disease. Not only interferons but also interleukins (IL2, IL1) in an appropriate dose⁸ can be used to treat certain metastases as part of LAK-cell treatment (lymphocyte activated killer cells, or special T-cells)⁹, but such treatment has severe side effects. All the above is at our disposal now, but due to the side effects, it is used infrequently, which may call for a change.

Let us have a look at a simple relationship on the analogy of the above:

Let us not forget that reducing the reaction of the fever center by administering hormones (see diseases of the thyroid gland)¹⁰ or neurohormones (e.g. endorphin) we do the same as if we blocked pyretic cytokines. This is because

1. The output in the above three immunology-related conditions (not in the blockade but generation of fever) is the same: FUO, which is analogous to long-standing hormonal fever in that they both are under psychic control, since, in the case of FUO, the main binding sites of cytokines in the brain are located in the thermoregulation center of the hypothalamus; cytokines “ensure” long-term subfebrile conditions. Malignant tumors, HIV infections and autoimmune diseases are characterized by basically cytokinergic FUO activities, which can be attributed to the change in the activity¹⁹¹ of autoantibodies. Each change in autoantibody activity is predominantly affected by a powerful psychic change or modification¹¹.

23. Vasopressin activity is supposed to be dependent solely on psychic strategies.

24. It is also suspected that neuro-endocrinological and immunomodular molecular influences change the activity of the thermoregulation center in the same way, via the increase and decrease of blood flow and/or thermosensation¹².

25. So there is identical output in neuroendocrinological and immunomodulatory systems in the hypothalamus. Input is also quite similar, analogous, only the modular structures are different.

⁸ See *ibid*

⁹ See NELSON: Nelson textbook of pediatrics / editor, Richard E. Behrman; Robert M. Kliegman, Valdo E. Nelson, Victor C. Vaughan, Harcourt Brace & Company, Philadelphia, 2002., pp.72-73.

¹⁰ NELSON, p.. 547.

¹¹ CMTD, pp. 775-776.

¹² NELSON, pp.22-23.

26. The above immunological processes are under heavy psychic influence basically, similarly to the neuroendocrinological ones.

27. The “psychic” effect is simultaneously present in neuroendocrine and immune processes, at the same location and according to the same principle of functioning; moreover, the hypothalamus is the area in which the majority of the cerebral binding sites for cytokines are located, at the same place with the control region of emotions and temper. To all likelihood, these three levels – psychic, neuroendocrinological and immunological – are in molecular biological interrelation with one another at one point.

According to my bold hypothesis, the search for the shared molecular biological layers of psycho-neuroendocrino-immunological control should be conducted in this region/area.

If that holds true, we can provide no less than psychosomatic basic modeling codes (at the level of the whole of the brain; – see cycles I and II of the previous chapter – between the complete autoimmune system, and infections and tumors). All this could be utilized as a more effective immunomodulatory method in the treatment of AIDS, cancer or autoimmune diseases, while we could solve the code-system of psychosomatics using the PET-MRI technique.

PS: All this is just a hypothesis but can be proved simply in the long run: if the attack points of cytokines in the central nervous system are switched off, it can be exactly and significantly examined whether the total immune effect changes or not, or is it only the fever that decreases, if, e.g., alpha interferon is administered.

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