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The Effects of Integrated Mental Training on Stress and Psychosomatic Health



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ABSTRACT

Russian students, age 18-22, used a systematic self-hypnotic training (Integrated Mental Training) for six weeks. The effects was measured in an acute stress situation (ice cold water) and during vital stress (end-of-the term examination.) The trained subjects showed significant less stressreactions, measured with psychosocial, physiological, biochemical and immunological tests. The biggest improvement of the immunological status, supported by clinical observations, were shown especially after the training of positive emotions.

ZUSAMMENFASSUNG

Russische Studenten im Alter von 18-22 Jahren betrieben über 6 Wochen hinweg systematische Selbsthypnose (integriertes mentales Training). Die Effekte davon wurden sowohl in einer akuten Stresssituation (eiskaltes Wasser) als auch während vitalem Stress (in der Examenszeit) gemessen. Die trainierten Studenten zeigten signifikant geringere Stressreaktionen, was mit psychosozialen, physiologischen, biochemischen und immunologischen Tests nachgewiesen werden konnte. Die größte Verbesserung des immunologischen Zustandes, die von klinischen Observationen gestützt wurde, zeigte sich insbesondere nach dem Training von positiven Emotionen.

KEY WORDS: Mental Training, Integrated Mental Training, Emotional Training, Self-Hypnosis, Psychosomatic Health, Stress, Stressreduction, Neuro-biochemical, Immunology, T-cells, Cortisol, BEN-levels, ECG, Cold Ischemic Test, CIT, POMS, Luscher.

SAMMANFATTNING

Ryska studenter i åldern 18-22 år använde sig av en systematisk självhypnotisk träning (Integrerad Mental Träning) under 6 veckor. Effekterna av detta undersöktes både i en akut stress-situation (iskallt vatten) och vid vital stress (tentamensperiod). De tränade studenterna visade signifikant mindre stressreaktioner, mätt med psykosociala, fysiologiska, biokemiska och immunologiska test. Största förbättringen av immunologiska status uppmättes i den gruppen, som fick lära sig inducera och träna med positiva emotioner (glädje m.m.)

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INTRODUCTION

IMT

Integrated Mental Training (IMT), developed by Uneståhl in the seventies (Uneståhl, 1993, 1996, 2004), consists of a regular, systematic and long-term training of mental skills and attitudes aiming to Peak Performance and Wellness. In other countries Mental Training is almost totally related to Sport while the Swedish IMT also works with Schools and Education, Work Life, Health and Clinical Areas. (Uneståhl, L-E., 1995, 1999, 2004, Uneståhl, L-E & Bundzen, P., 1996, Uneståhl, L-E., Bundzen, P. & Bendjukov, M., 1994)

Stress Management

One important application of IMT is the area of Stress Management and the increase of stress tolerance as a basic mechanism of psychosomatic health.

It is well known that negative stress can promote the development of pathology in any organ or system, especially in genetically predisposed diseases. However, the majority of authors maintain that irrespective of the kind of stress, the central nervous system as well as the cardio-vascular systems are basic stress targets in the human organism (Baeva, E. et al. 1990, Furuduj, F., 1990, Johnson, E. et al., 1992, Chronsos, J. et al., 1993, Grey, M., 1993, Nagata, S., 1993, Theorell, T., 2002)

A number of studies have shown the effect of Hypnosis, Relaxation and Guided Imagery in the area of Stress and Psychosomatic Health (Gruzelier, J.H., 2002) but to our knowledge no study have been done to investigate the effects of a systematical and long-term self-hypnotic training.

Questions

This lack of previous investigations of the stress limiting effects of IMT lead to the following questions:

1. In what ways will the "Mental Room" change the subjective and physiological effects of acute experimental stress
2. In what ways will a long-term IMT change the neuro-biochemical and immunological effects of vital stress (examination period)
3. Are there any differences between the various parts of IMT in the stress reducing effects of IMT.

DESIGN AND METHODS

In total 90 students from various academical centers in St. Petersburg, age 18-22, took part in the two series of experiments.

The experimental groups (EG1, EG2) were practicing the Russian versions of the Swedish IMT (Bundzen et. al., 1994). The Control Groups (CG1, CG2) had the same curriculum and measurements but did not use any of the IMT-programs.

psycho-emotional status was significantly improved ($p < 0.01$). Also the Spielberger-Khanin Scale showed a reduction of anxiety levels ($p < 0.05$).

The AT-norms, however, tested by the Luscher test, showed no significant changes after one MR-induction.

Pain tolerance

The EG, in difference to the control, showed a significant increase of the pain tolerance (TAPS), measured with the CIT ($p < 0.001$). 16 out of 30 showed increases of more than 50% over the initial state and in additional 4 subjects no pain sensation at all was felt during the entire test.

Biochemical measures

EG showed a 15-20% reduction of cortisol levels ($p < 0.005$) and FFA ($p < 0.01$) while no changes could be seen in the CG.

CVS State

A significant reduced pulse rate was observed ($p < 0.05$). Systolic arterial pressure also decreased in a parallel way ($p < 0.05$). In some cases the disappearance of the rhythm migration leader was noted along with some improvement of the repolarization process of the ventricles and of conductivity in the right pedicle.

STUDY 2

The intention of this study was to show the long-term effect of systematic IMT-training.

POMS test

The positive effects, already shown after the first session (study 1), had further increased and showed a significant decrease of the total POMS-index ($p < 0.05$) after the 6 weeks of training.

Beta-endorphin levels (BEN)

After the 6 weeks a significant increase of BEN levels could be seen, while there was no change in the CG. However, an important difference could also be seen between the two experimental groups. E2b

(training of positive emotions) showed a much higher increase (twice the initial value) than E2a.

DISCUSSIONS

These effects of MR (self-hypnosis) on pain perception and pain tolerance (TAPS) indicate a functional reconstruction in the activity of the central nervous system in subjects in and after MR. The reduction of pain and the improvement of the mood states can be associated with increases in the activity of the cerebral opioid system. This is corroborated by the data from Tomas and Turner (1990), who observed the disappearance of sense of joy in persons practicing relaxation after receiving naloxon.

The reported alterations in pulse rate, arterial pressure and ECG readings may be considered to be an index of the reduction of sympathetic influences on the cardio-vascular system and of the level of catecholamines in the peripheral blood supply, which is confirmed by the results from the biochemical study. The hormonal alterations described promote a decreasing flow of calcium to the cardiomyocytes (resulting in a reduction of the pacemaker activity of the sinus node) and to some other centers of the autonomic nervous system as well as improved conductivity in the myocardium and normalized metabolism (Meerson, F., 1984; Fjodorov, B., 1990)

Cortisol and adrenalin (ascertained via FFA content) are basic hormones playing a leading role in the development of stress reactions (Selye, H., 1957; Cox T., 1987, Åkerstedt, T & Theorell, T., 2002). At the same time BEN, as a part of the stress limiting system, restricts excess development in this area (Blalock, G. et al, 1985, Selye, H., 1989; Zorulja, A., 1990) and prohibits damage from catecholamines and corticosteroids. According to authors like Filaretov (1993), Rosenblatt (1993) and Gazda, L., Smith, T. & Watkins, R., et. al., 2003) the release of endogenic opioid peptides from the cells of the hypophysis provide the fundamental means by which the nervous system exerts its influence on the organism's stress targets. The findings concerning the reduction of the level of cortisol in the FFA as well as the findings concerning the increase of BEN levels demonstrate the stress limiting effects of IMT. These findings enable us to define more exactly the biochemical mechanisms behind the ability of IMT to affect the immune and cardio-vascular systems.

Special observations related to the Immune System

In the long-term study 10 students, 5 each from EG and CG, were selected based on earlier high sickness rate. From the beginning both groups showed strained cellular immunity (T-cells) combined with reduced I gM in the blood serum. However, during the course of IMT the 5 EG students showed a significant IGgM increase ($p < 0.05$) and a tendency toward increasing IGgA and I gG levels as well as a tendency towards normalization of cellular immunity. The 5 students in the CG indicated changes with an opposite trend, namely toward humoral depression and an increasingly strained cellular immunity system.

These data were also supported by clinical observations. 3 of the 5 students in CG suffered from the following diseases during the course of the second study: Acute laryngotracheitis, acute right-sided bronchial pneumonia and pyoderma. Among the 5 EG subjects only one suffered from an acute respiratory-viral infection and only during the first week of the study.

IMT and Immunology

These observed immunomodulating effects are probably conditioned by the activation of the immunocompetent cells' opioid receptors which seems to prevent the premature influencing of corticosteroids and catecholamines during conditions of physiological stress and also seems to regulate the stimulation of the entire immune system (Blalock, E. et al, 1985, Antoni, M.H., 2003)

A decrease in the sympathetic nervous system provides the base for the common use of IMT as a stress reducing and health promoting training. This is further enhanced by the simultaneous activation of the endogenous opioid peptides.

SUMMARY

Stress-reducing effects, measured psychologically, physiologically, biochemically and immunologically, were shown under conditions of acute stress (CIT) and chronic stress (examination period). The best effects could be seen in E2b, the group which combined the basic Mental Training with two weeks training of positive emotions (Cheerfulness, joy). Thus, the wellknown immunodeficit effects by stress and depression seems to be contradicted by selected part of the IMT training.

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