

**Introduction**

Growing body of evidence shows that early life stress and breaking the mother-newborn bond (early maternal neonatal separation) cause damage to natural breathing pattern, immune response and reaction to stress. Research on immune effects of emotional expression (Pennebaker), psychosomatic network (Pert et al.), mindfulness, pranayamas and neurobiology research on periaqueductal gray with associated neurophilosophy (Damasio, Watt) suggest beneficial impact of rhythmic conscious breathing on endocrine, immune and nervous system.

**Goal**

The goal of this study was to create a new form of body psychotherapy, suitable for cancer patients – Integrative Breathwork Psychotherapy (IBP) and compare its outcomes to results of the control group receiving “treatment as usual” - verbal psychotherapy and relaxation sessions.

**Method**

Psychotherapy: IBP had to satisfy many requirements specific to cancer patients. It should cause an immediate affective and physical improvement, be suitable for patients with different education, cognitive abilities, psychological mindedness, tired with treatment. It should enable the patients to practice on their own after completing an intensive psychotherapy program. IBP integrates intensive training of one of the rhythmic breathwork methods and the state of mindfulness. A breathwork session is followed by verbal expression. Patients express their feelings freely and give them their own meaning. IBP has strictly defined setting, frequency and session timeline. In its essence it thus activates the bond between breath and bodymind.

**Materials and Methods**

Variables analyzed: blood morphology like WBC, lymphocytes subclasses counts including Natural Killer Cells (known of their anti-cancer activity), prolactin and cortisol serum concentration (stimulating and diminishing immune response respectively), parameters related to arterialized capillary blood gasometry (pO<sub>2</sub>, pCO<sub>2</sub>, blood pH), psychological (depression, anxiety, aggression-HADS-M, adaptation to cancer - Mini-Mac), medical status, and nicotine use of 78 breast cancer inpatients undergoing post-operative radical radiotherapy (RT) in years 2006-2007. All consecutive patients who matched inclusion criteria were invited to take part in the study (response rate-65%). Experimental group (E) taking part in IBP (n=47) was similar to control group C (n=29) according to age (mean 51,8), stage of disease (T, N, pT, pN), treatment type (mastectomy - 53%, partial mastectomy 47%, chemotherapy 71%, hormonotherapy – 68%) and emotional state at baseline.

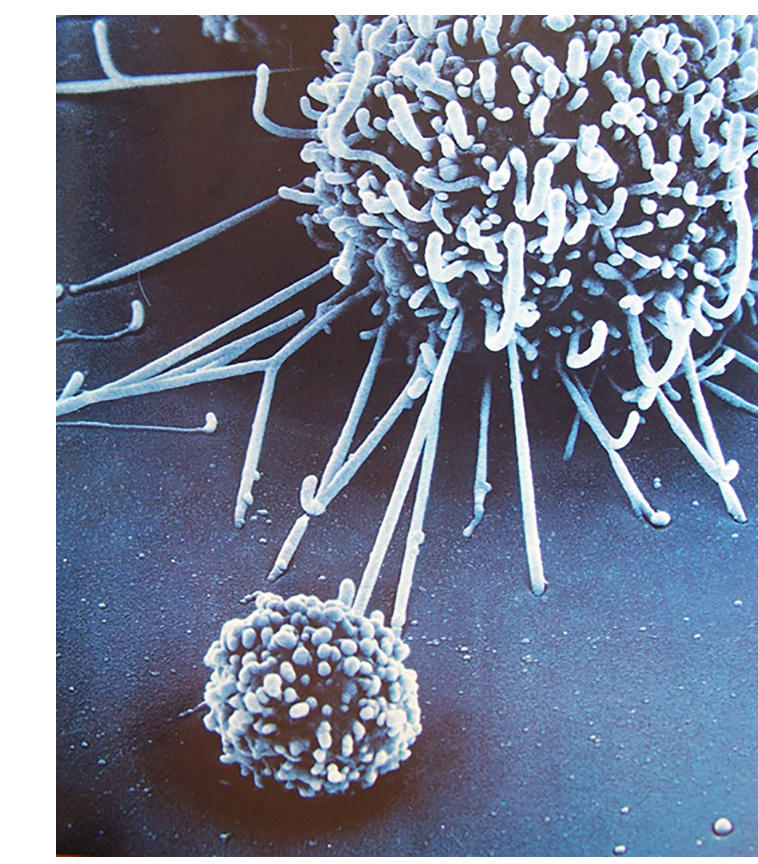
**Procedure**

Measurements were taken before starting IBP, after ten 45-minute long sessions (3 per week), two weeks later (end of RT) and 10-12 weeks later. Hormones and capillary blood gasometry measures were also taken before 10th session and 30 min later (2/3 of the session).

**Results**

10 weeks after RT completion both groups showed decreased intensity of anxious preoccupation (E- p<0,01, C<0,05, fig.1) and anxiety compared to baseline (E- p<0,001, C- p<0,01, Fig.2). Anxiety after 10 sessions was lower in E group (p<0,05, Fig.2). Aggression level was lower in E group in all measurement points except for pre-test (p<0,05, Fig.3). E group experienced better positive reevaluation of their disease comparing to C group, (p<0,05 fig.4). Lymphocytes counts decreased in both groups during observation (Fig.5). NK cells counts were both higher in E group 10 weeks after RT compared to C group (p<0,01) and compared to E group baseline (p<0,001, Fig.6). Prolactin concentration raised (p<0,01) and cortisol levels dropped in E group during IBP session (p<0,001) and 3 months later compared to group baseline (p<0,05, fig.7, fig.8, fig.9). E group showed significant changes compared to the baseline and other differences compared to C group in most gasometry parameters (e.g. higher pO<sub>2</sub>, lower pCO<sub>2</sub>, higher pH, fig.10-15).

NKC counts increased in 72% of patients in E group and 32% of C group. Additional multiple regression analysis showed that final NK cells count in experimental group was related to baseline NKC count, pH increase during intensive IBP phase and low aggression level at baseline (R= 0,595, R<sup>2</sup>= 0,354, p<,00027).



Natural Killer Cell approaches cancer cell.



Natural Killer Cell destroys cancer cell.

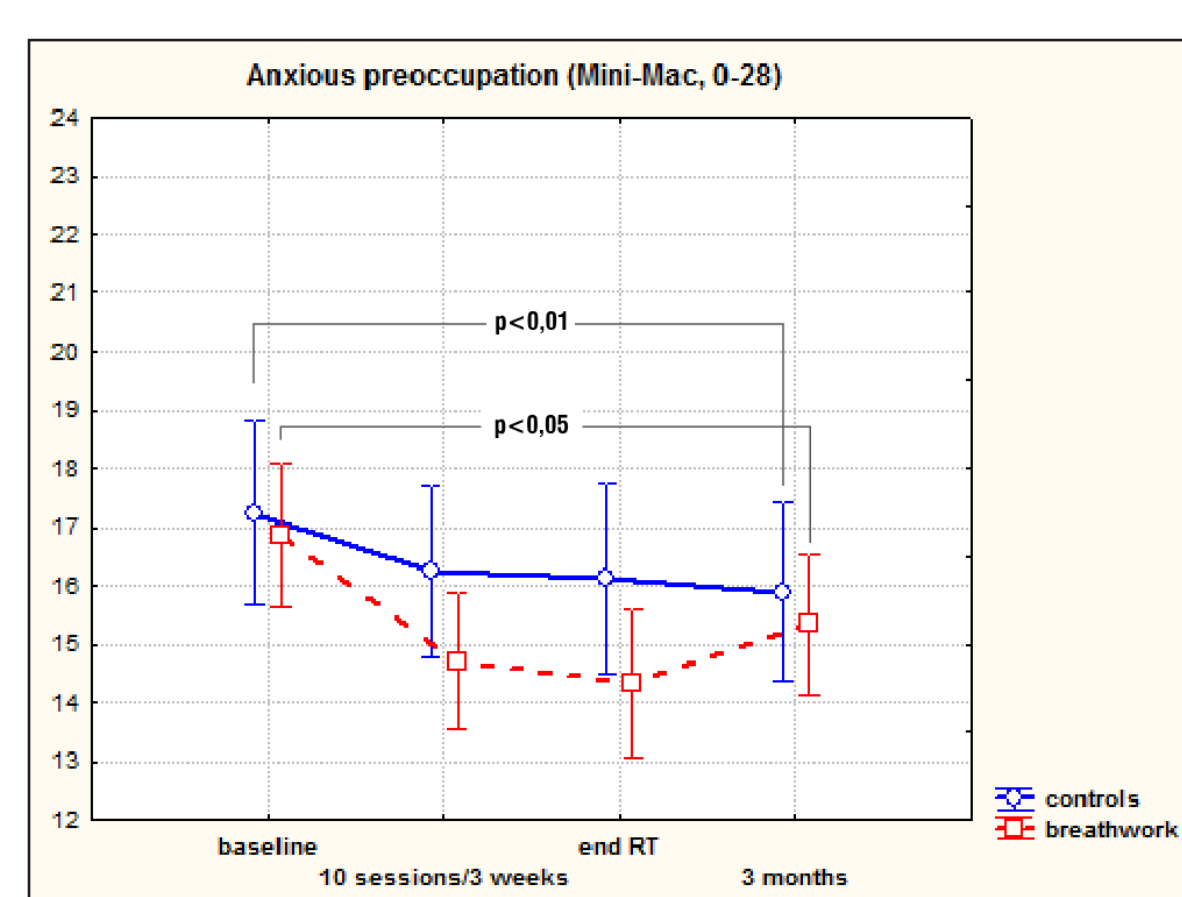


Fig.1

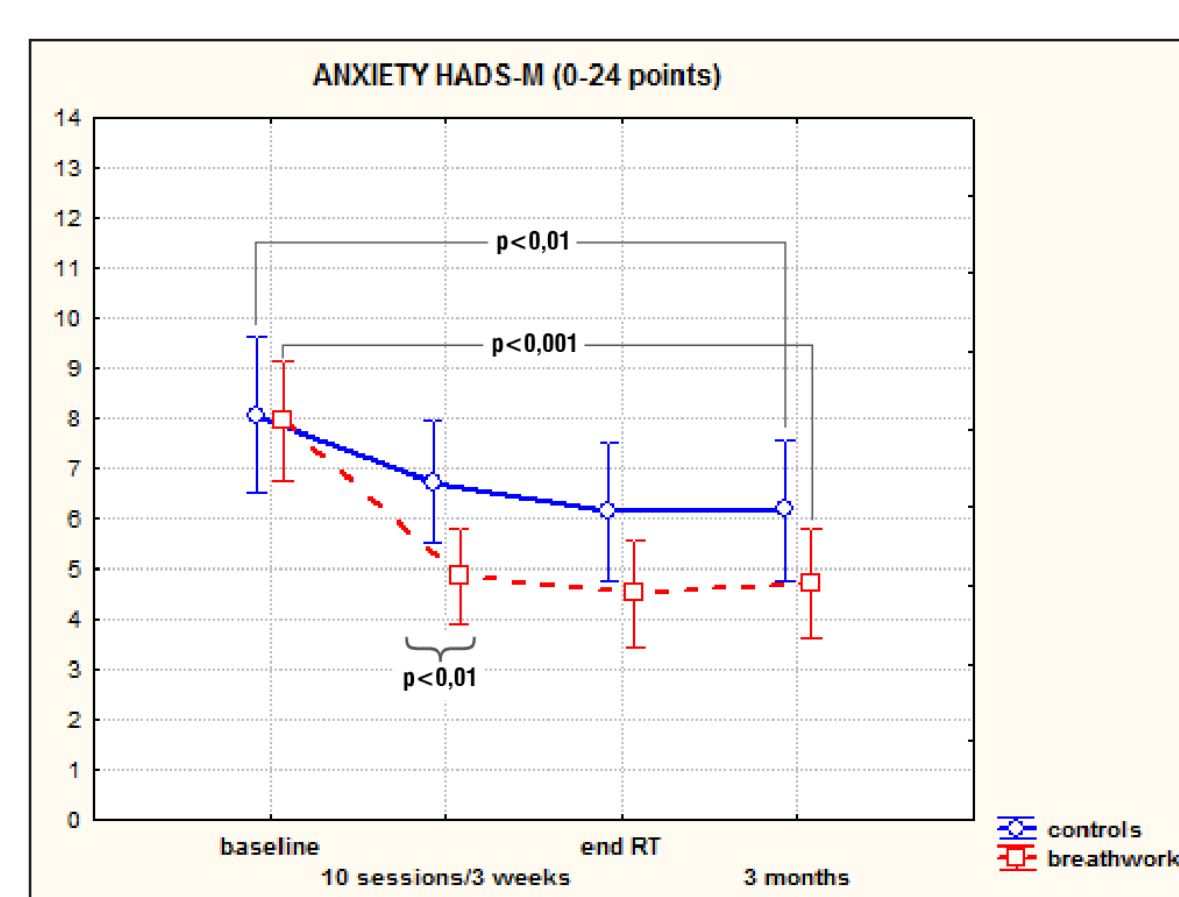


Fig.2

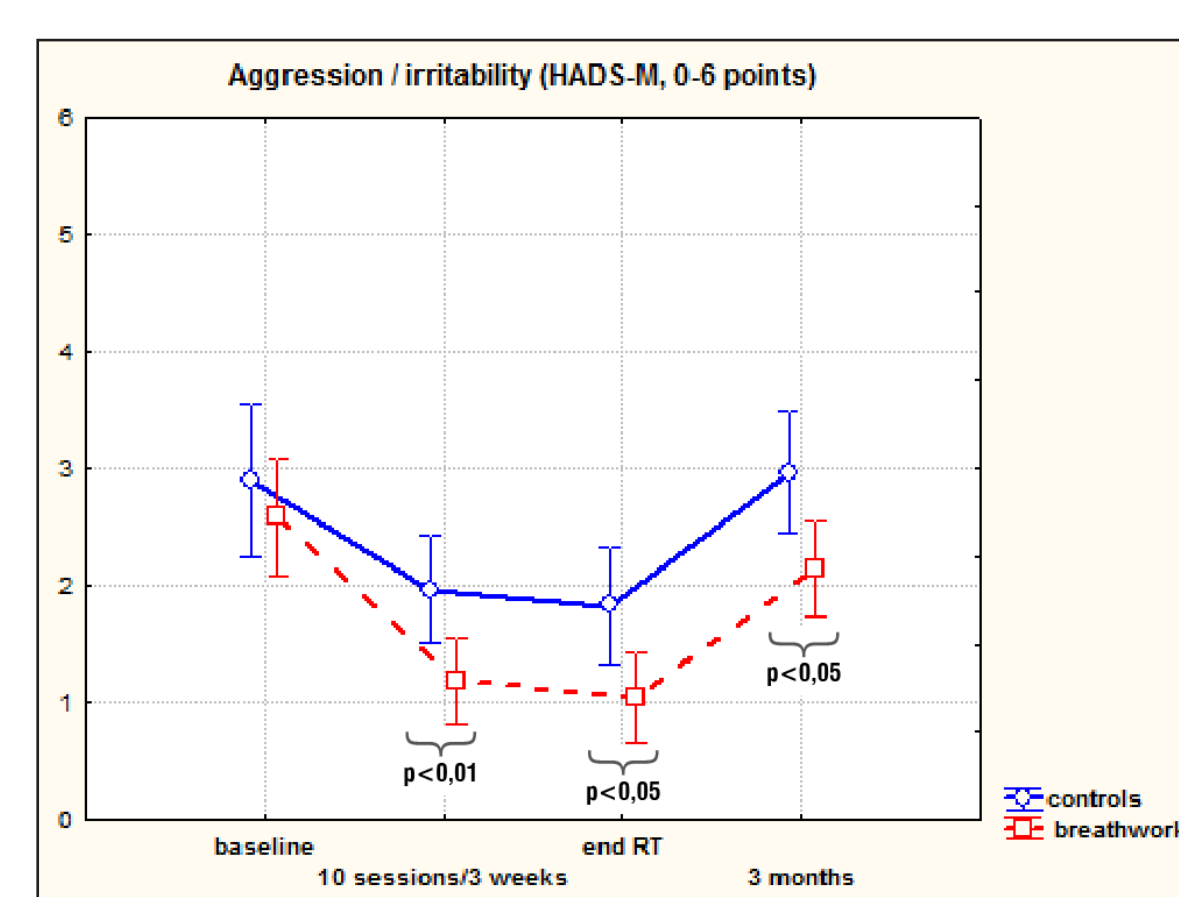


Fig.3

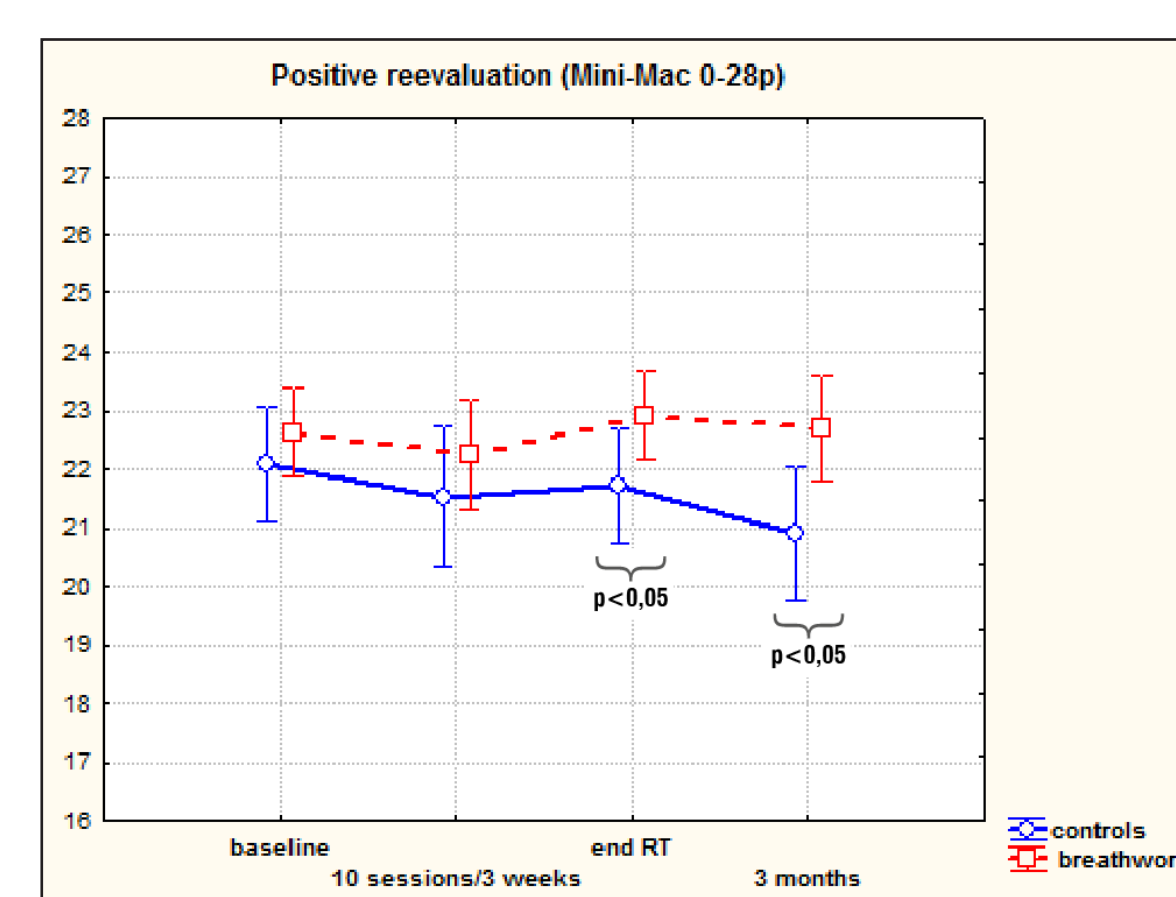


Fig.4

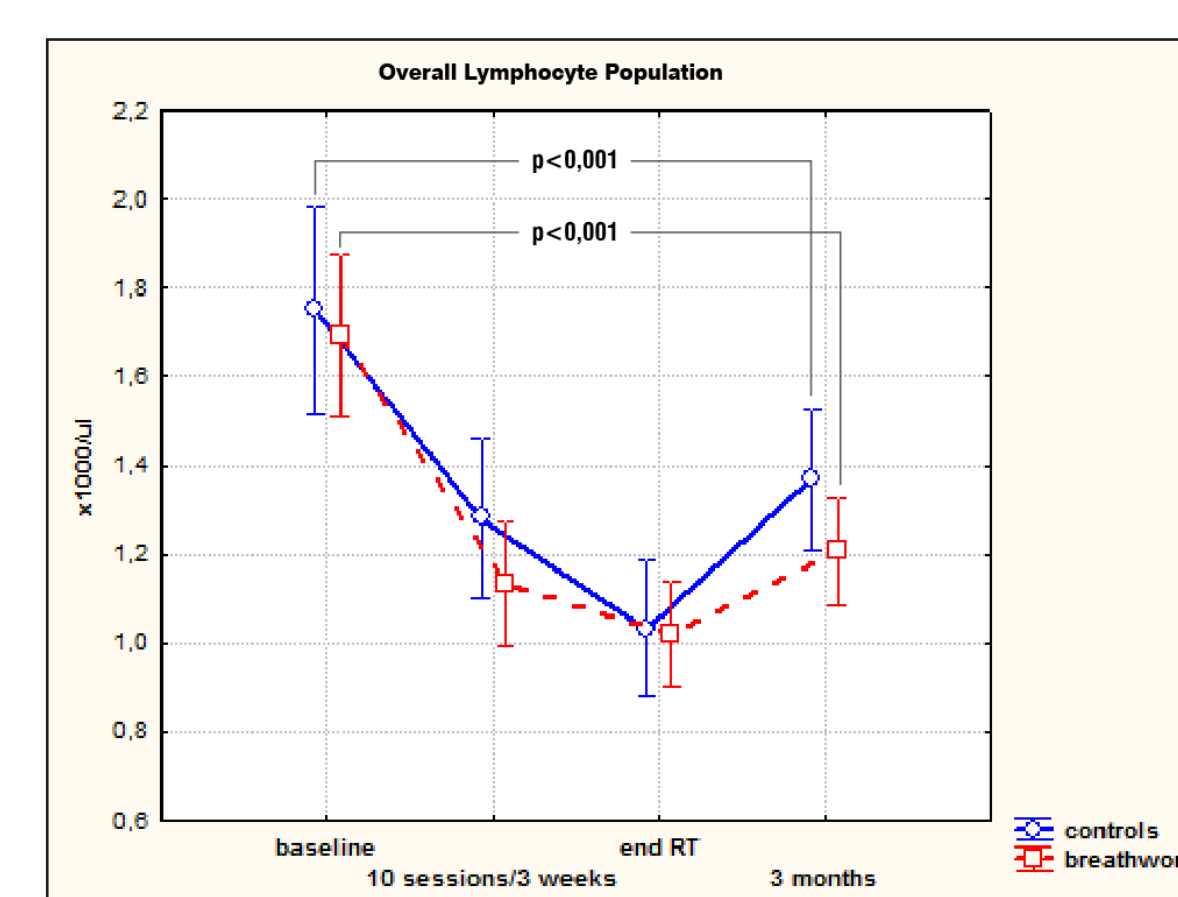


Fig.5

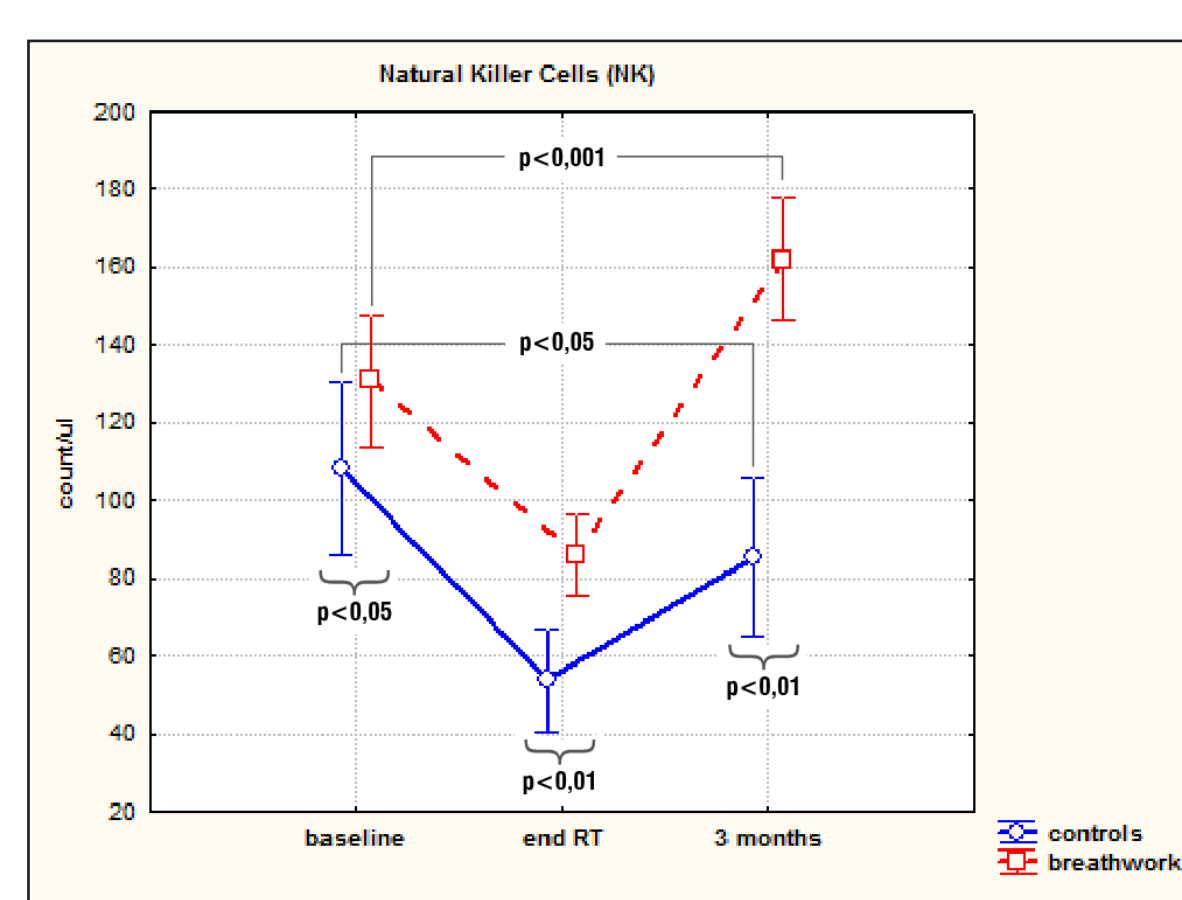


Fig.6

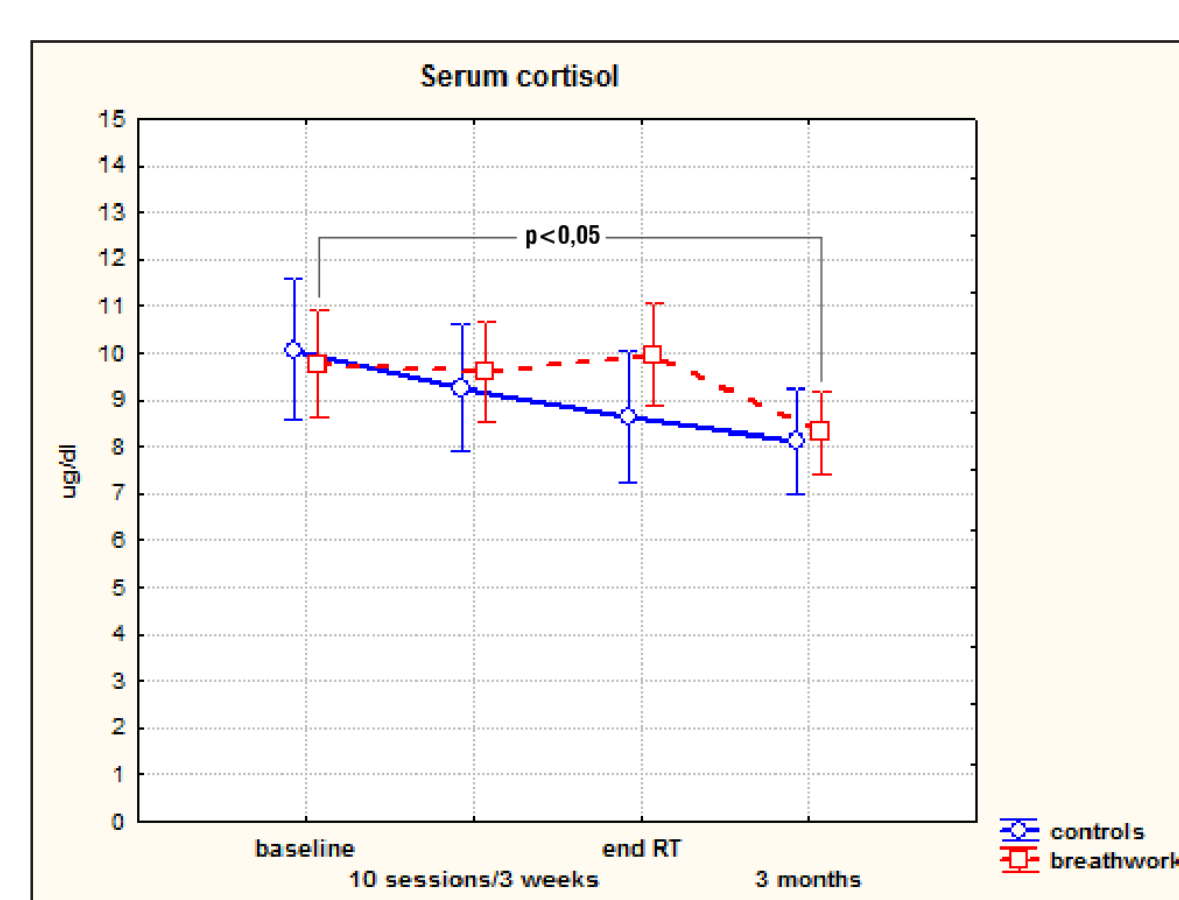


Fig.7

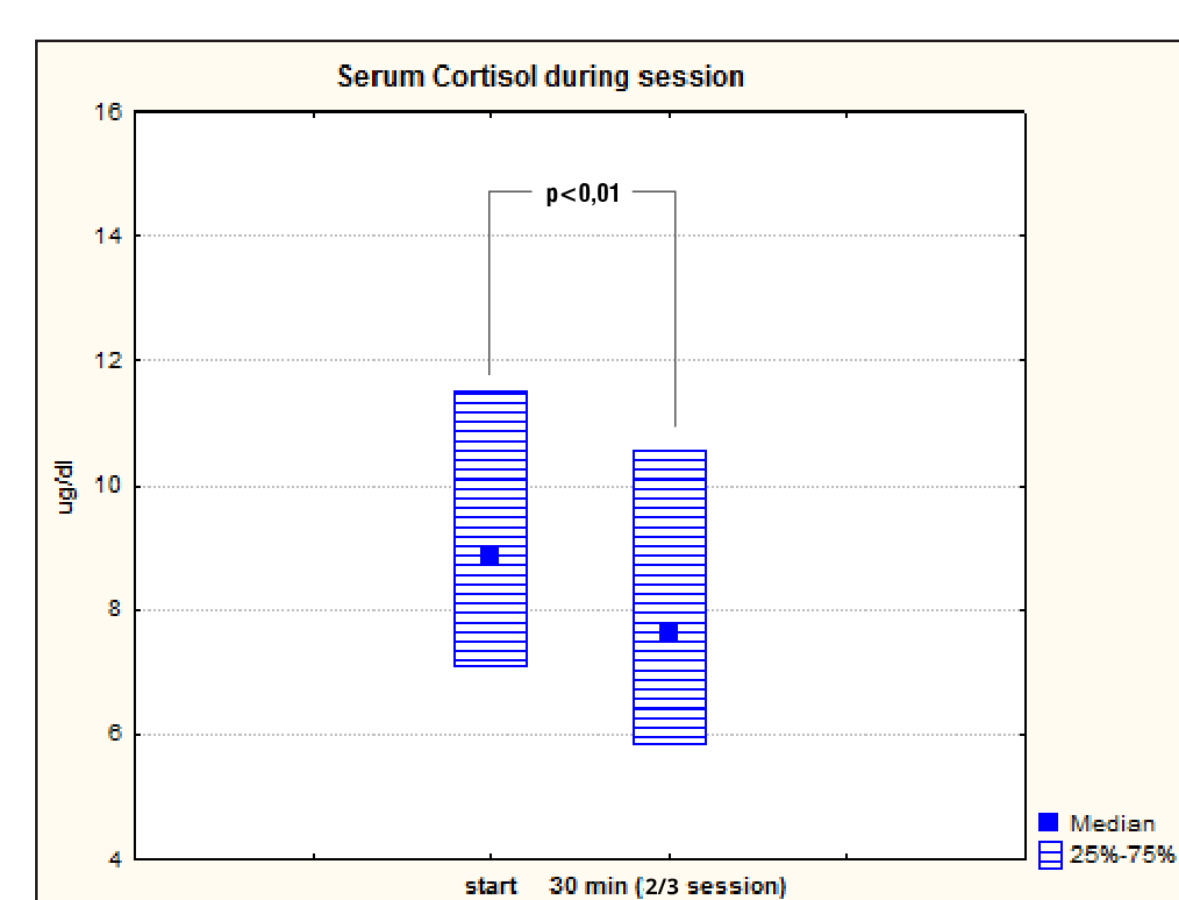


Fig.8

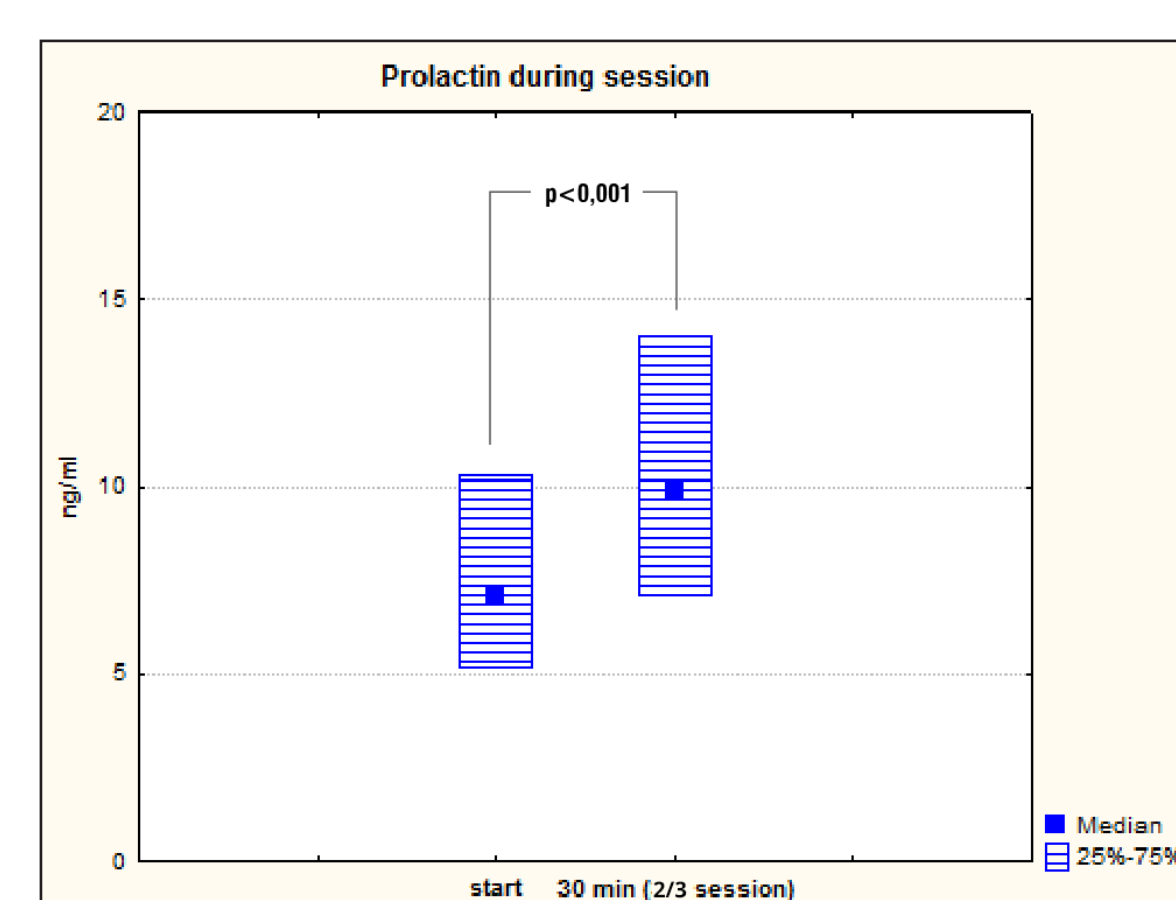


Fig.9

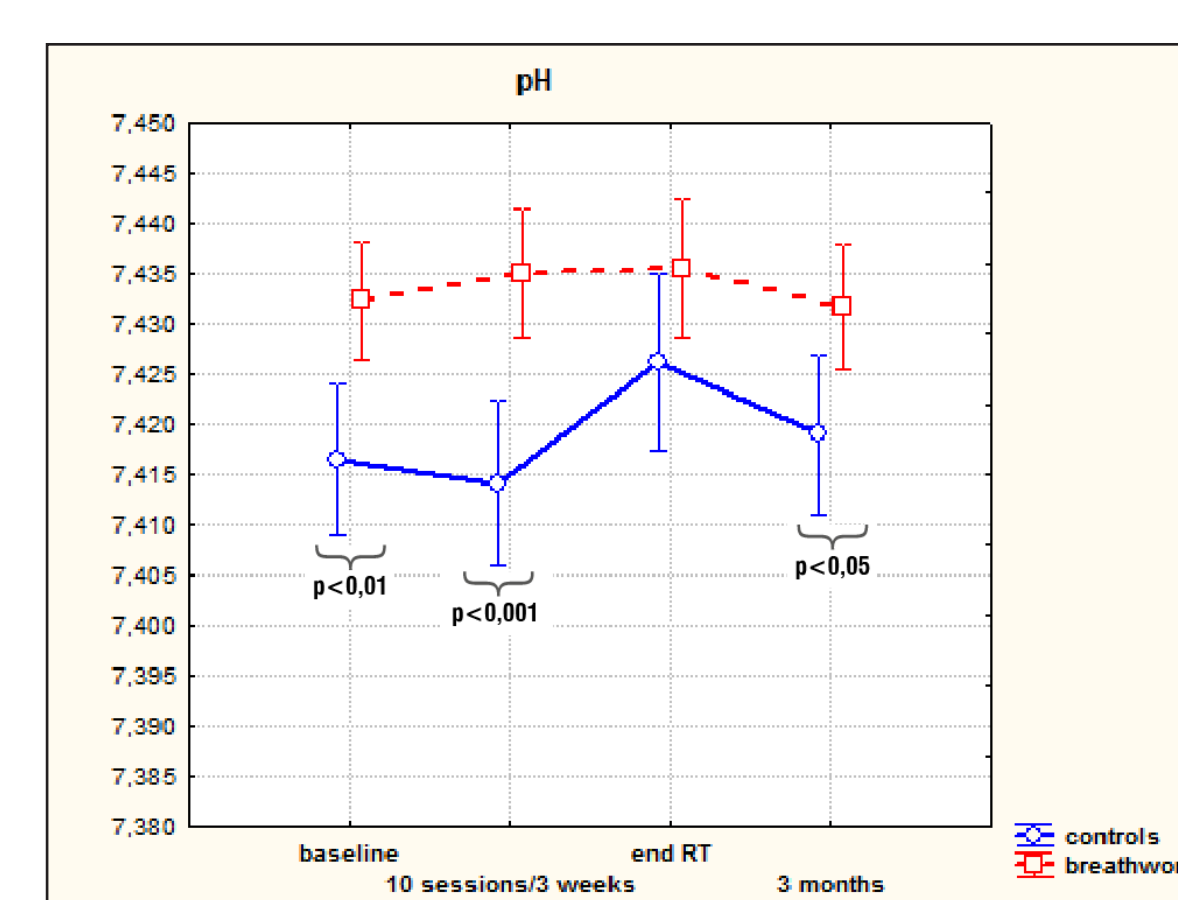


Fig.10

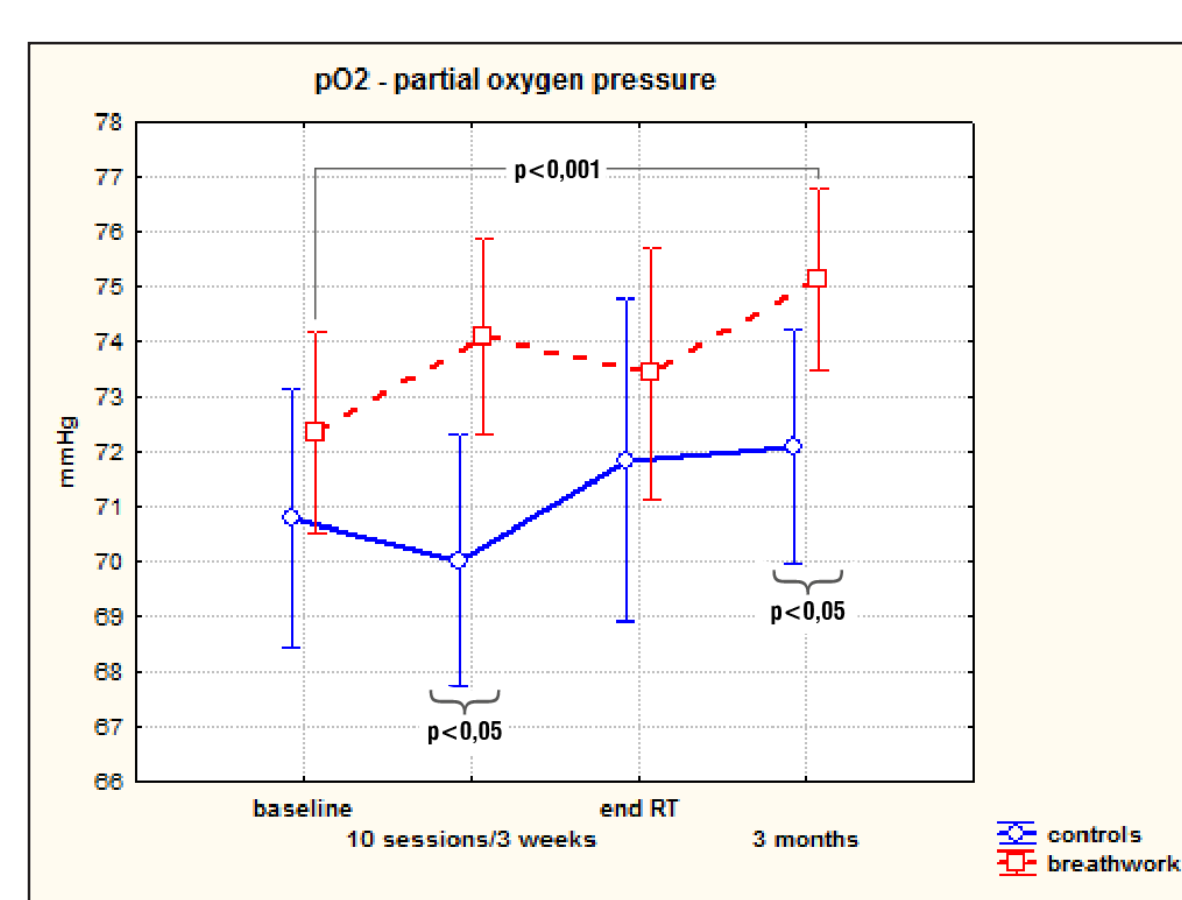


Fig.11

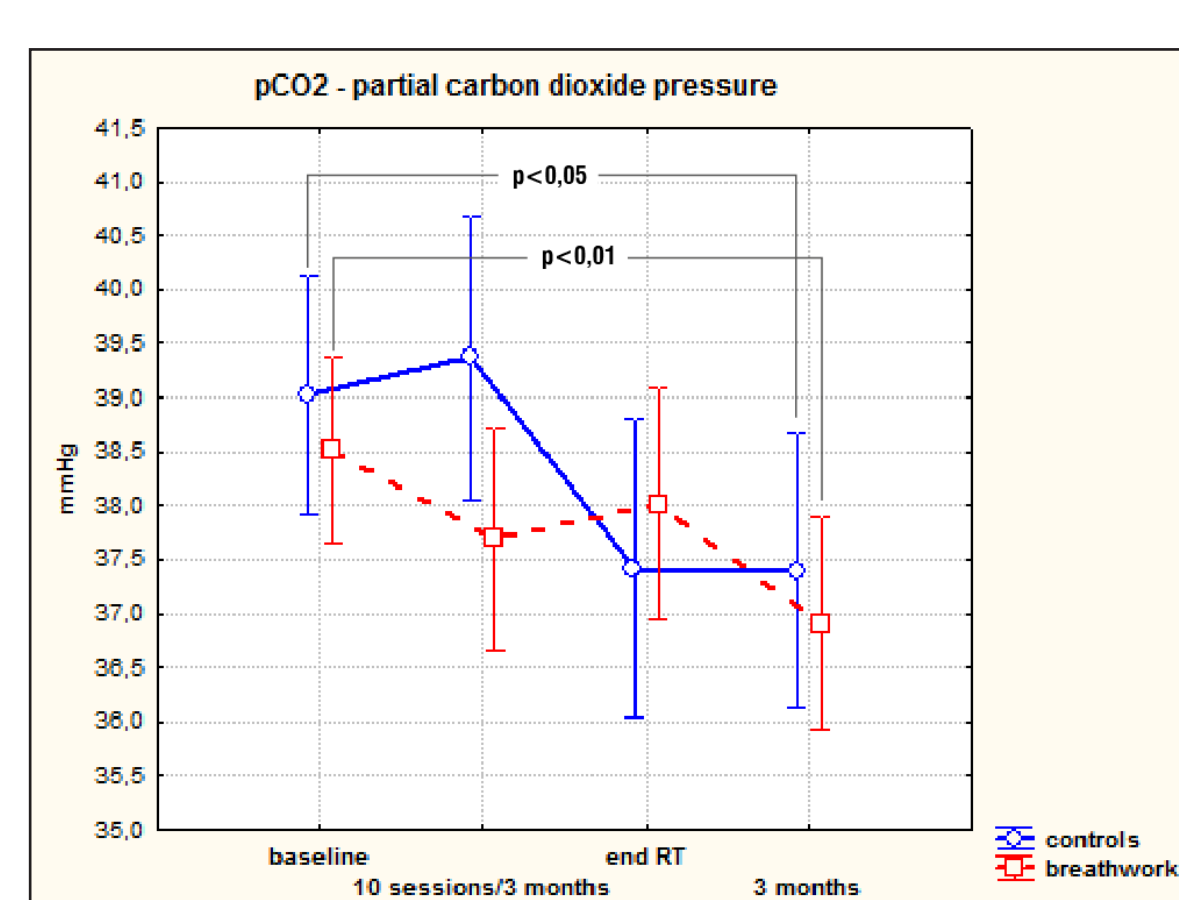


Fig.12

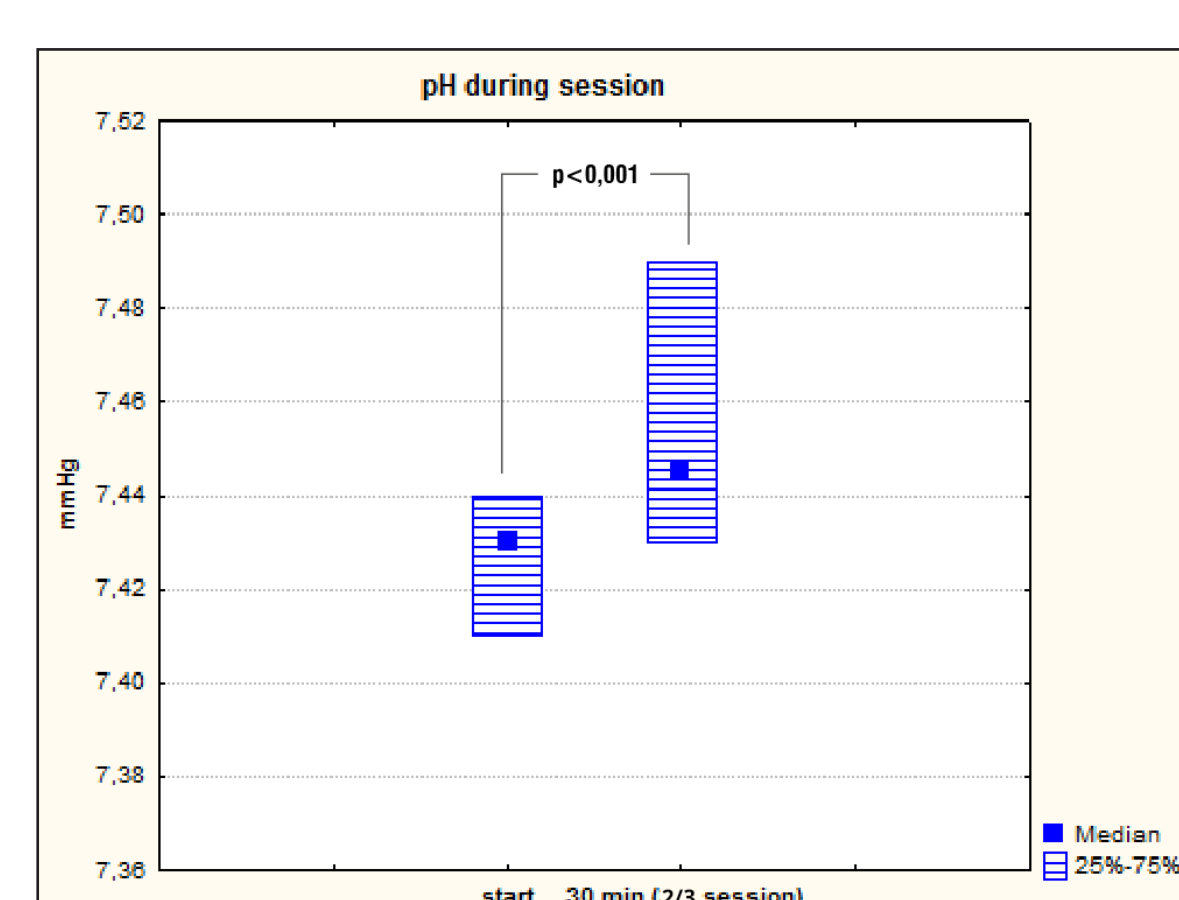


Fig.13

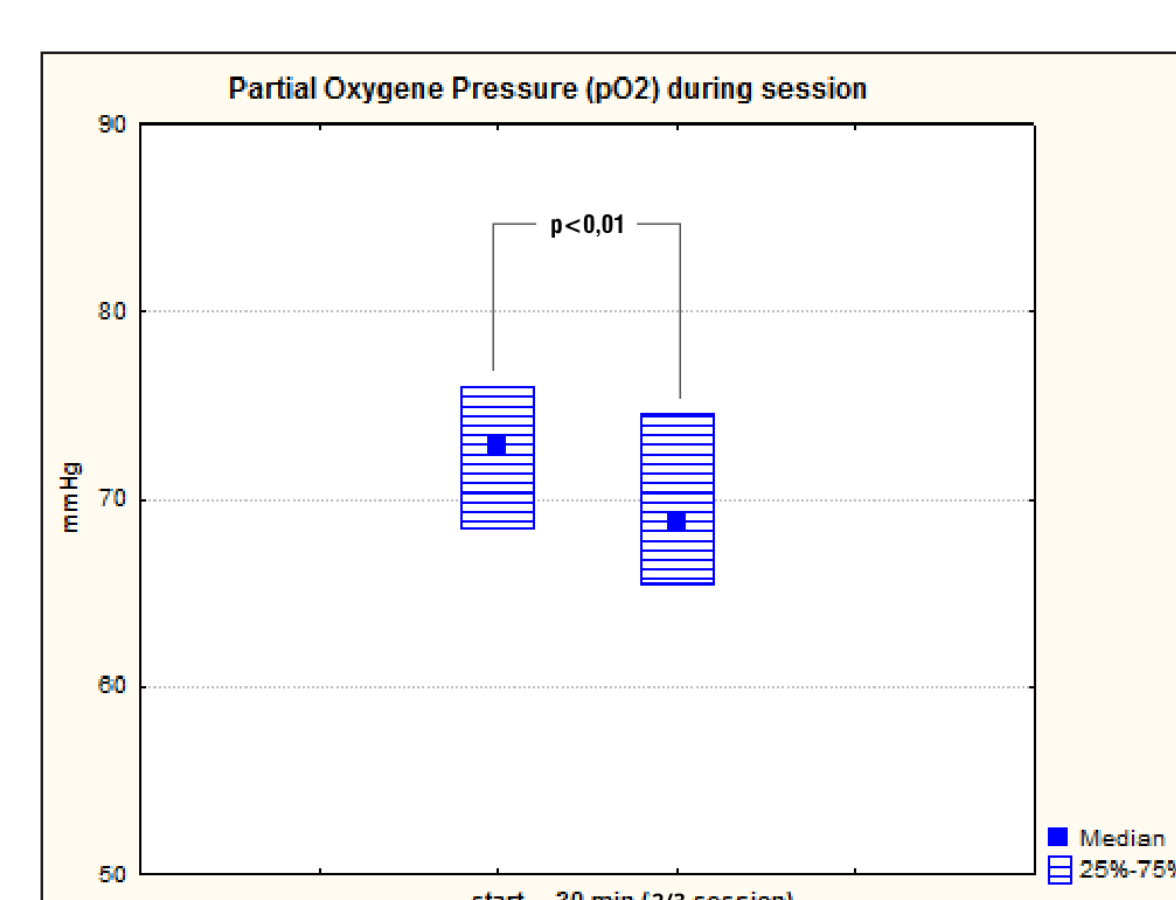


Fig.14

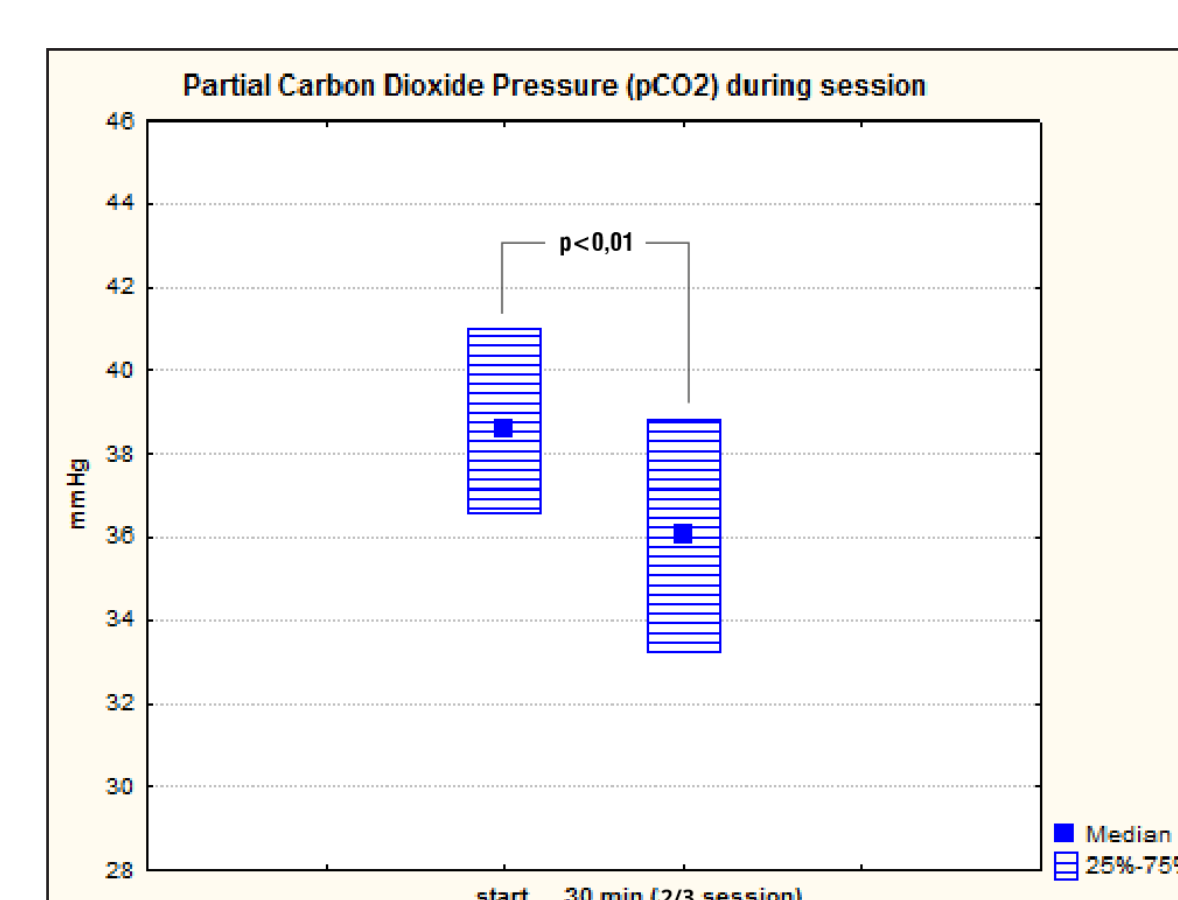


Fig.15

**Conclusion:**

IBP group had better psychological outcomes than control group. Contrary to controls IBP group showed significant improvement in: NK Cells counts (anti cancer activity), chronic stress reduction (↓ cortisol), oxygenation (↑pO<sub>2</sub>), pro-health breathing pattern (pCO<sub>2</sub>) and remained more alcalic during intensive training (↑pH). IBP Session probably stimulates NKC (probably via prolactin increase and cortisol decrease, see Mavonungou, 2005).

The results indicate that activating the bond between breath and bodymind in the process of psychotherapy allows to transform old patterns of psycho-physiological functioning. In particular IBP caused beneficial changes in the emotional status, hormonal and immune response of breast cancer patients.