

IMPROVEMENT OF UPPER LIMB'S CONDITION OF WOMEN WITH POST MASTECTOMY SYNDROME WITH THE HELP OF PROBLEM-ORIENTED PROGRAM OF PHYSICAL REHABILITATION

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Abstract. *Purpose:* to determine effectiveness of problem-oriented program of women's physical rehabilitation with post mastectomy syndrome in improvement of upper limb's functional state. *Material:* 50 women with early symptoms of post mastectomy syndrome at stationary rehabilitation stage, who underwent radical mastectomy by Madden were involved in the research. Testing of movement amplitude in shoulder joint, swelling of upper limb and muscular strength of hand's flexors was conducted on 2nd day after surgery and at the end of stationary rehabilitation period (12-14th day). *Results:* Main means of the authors' program were: general and special physical exercises; static and dynamic breathing exercises; breathing through preloaded lips, controlled coughing, autogenic drainage, manual pressing, manual vibration; post-isometric relaxation; elements of labor therapy; lymphatic drainage massage and self massage; topical talks; consultations; auto training. The trainings were conducted individually 2-3 times a day; 20-30 minutes every session. The patients' independent trainings included: fulfillment of therapeutic positions, self-massage, relaxation exercises and auto-training. *Conclusions:* application of problem-oriented physical rehabilitation program facilitates improvement of upper limb's functional potentials of women with post mastectomy syndrome.

Key words: breast cancer, rehabilitation, shoulder joint, amplitude, swelling.

Introduction

Modern conception of breast cancer treatment is based on usage of complex impact, which includes radiation therapy, chemical therapy, hormone therapy, immune therapy. But the method of priority is still surgery [1, 2, 10, 12]. All these in total cause progressing of post mastectomy syndrome (PMS). PMS is expressed in such symptoms as lymphostasis, weakening of muscular strength, restriction of movements' amplitude in shoulder joint, disordering of sensitivity, vegetative trophy disorders of upper limb and negative psycho-emotional after-effects [2].

Advanced randomized researches prove purposefulness of early detection and constant monitoring of these disorders for timely overcoming of negative functional disorders and improvement of life quality of women of this nosology [4, 5, 8, 9, 13-24]. However, in most cases orientation on medical component of rehabilitation, working out of modern schemas of medicine provisioning, implementation of reconstructive plastic surgery, prevail. But physical rehabilitation of patients with PMS is not paid sufficient attention to.

The above said witness about significance of working out and realization of timely rehabilitation measures for timely correction of post mastectomy syndrome.

Purpose, tasks of the work, material and methods

The purpose of the research: is to determine effectiveness of problem-oriented program of women's physical rehabilitation with post mastectomy syndrome in improvement of upper limb's functional state.

Material and methods of the research: theoretical analysis of scientific-methodic literature data, Internet and empiric data; goniometry (assessment of shoulder joint's mobility); dynamometry (assessment of hand flexors' strength); anthropometry (assessment of difference between segment perimeters of upper limb at level of shoulder, forearm and hand for determination of swelling volume); methods of mathematical statistic.

The research was carried out on the base of Zaporozhskiy regional cancer center. In experiment 50 women with early symptoms of post mastectomy syndrome participated. With method of random sampling we formed main group (MG) and group of comparison (CG) with 25 persons in every group. Mean age of the tested was accordingly 55,44±1,06 and 55,60±1,14 years. Testing of movement's amplitude in shoulder joint, swelling of upper limb and strength of hand flexors' muscles took place on 2nd day after surgery and at the end of rehabilitation stationary stage (12-14th day).

Women of comparison group were treated by program of T.I. Grushina [1]. Main group was treated by authors' problem-oriented program. This program envisages reasonable choice of means, methods and forms of physical rehabilitation. All these concern: the process of post surgery period; age; characteristics of physical, functional and psycho-emotional status as well as presence of collateral pathology, type of attitude to disease and volume of surgery. For every patient of main group means, forms and methods of physical rehabilitation, which would reach the target in the most effective way, were selected individually. Main means were general and special physical exercises; static and dynamic breathing exercises; breathing through preloaded lips, controlled coughing, autogenic drainage, manual pressing, manual vibration; post-isometric relaxation; elements of labor therapy; lymphatic drainage massage and self massage; topical talks; consultations; auto training. The trainings were conducted individually 2-3 times a day; 20-30 minutes every session. The patients' independent trainings included: fulfillment of therapeutic positions, self-massage, relaxation exercises and auto-training.

Results of the researches

Analysis of the conducted experiment showed positive influence and purposefulness of application of the worked out problem-oriented physical rehabilitation program for improvement of movement's active amplitude in shoulder joint on operated side (see table 1).

Table 1. Change of goniometry indicators on operated side (M±m) of MG women in comparison with CG at rehabilitation stationary stage

Indicator	MG (n=25)			CG (n=25)		
	before	after	p	before	after	p
bending	40,52±2,42	113,80±3,15 **	<0,001	41,72±2,17	102,04±3,06	<0,001
unbending	25,20±1,59	45,36±1,77 ***	<0,001	25,44±1,49	31,44±1,45	<0,001
moving aside	37,00±1,68	110,08±3,27 ***	<0,001	39,08±1,69	78,84±5,26	<0,001
inside rotation	37,40±2,11	53,44±1,83 **	<0,001	35,48±1,97	45,28±2,26	<0,001
outside rotation	36,64±1,89	54,24±1,34 *	<0,001	37,44±1,65	49,88±1,69	<0,001

Notes: * – p<0,05, ** – p<0,01, *** – p<0,001 with comparing of final indicators of main group and comparison group.

Repeated measurement of movement's active amplitude in shoulder joint (see table 1) resulted in the following. MG patients demonstrated significant improvement of indicators: bending – by 73,28 degrees (p<0,001); unbending – by 20,16 degrees (p<0,001); moving aside – by 73,08 degrees (p<0,001); inside rotation- by 16,04 degrees (p<0,001); outside rotation – by 17,60 degrees (p<0,001).

Comparison of final indicators on operated side of main group and control groups' women showed confident distinctions by all directions of movements in shoulder joint. In MG indicator of bending was higher by 11,76 degrees (p<0,01); unbending – by 13,92 degrees (p<0,001); moving aside – by 31,24 degrees (p<0,001); outside rotation – by 8,16 degrees (p<0,01); inside rotation – by 4,36 degrees (p<0,05).

Results of changes of movements' active amplitude indicators in both groups in percents from norm are presented in fig. 1. At the end of experiment bending indicators in MG were 63,22±1,75% from norm. Results of other indicators are as follows: unbending – 75,60±2,95%; moving aside – 61,15±1,81%; inside rotation– 76,34±2,62%; outside rotation– 66,96±1,65%. In comparison group they were accordingly: 56,68±1,70%, 52,40±2,49%, 43,80±2,92%, 64,68±3,23%, 55,42±1,88%.

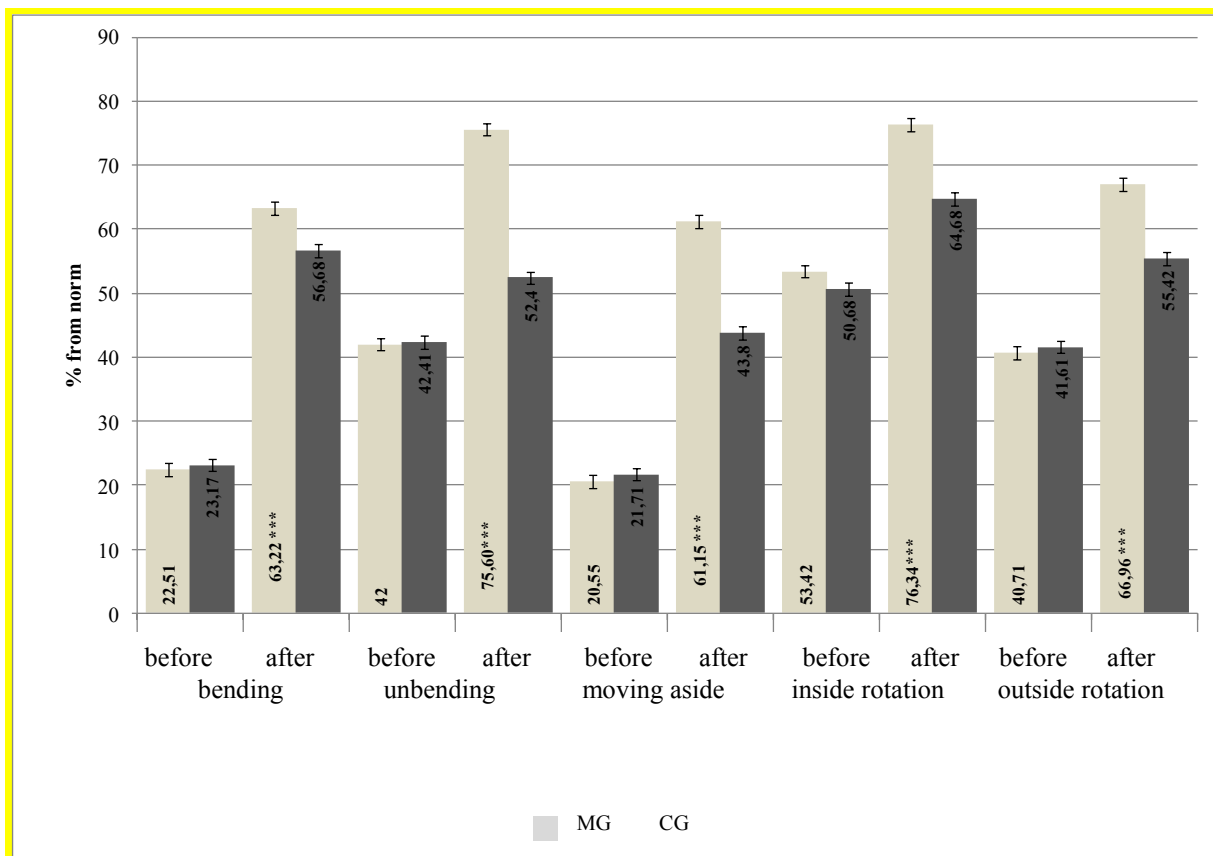


Fig.1. Change of goniometry indicators in MG, comparing with CG in % from norm under influence of rehabilitation, where: *** – $p < 0,001$ (comparison of MG initial and final indicators); ••• – $p < 0,001$ (comparison of CG initial and final indicators).

Repeated testing of hand flexors' strength showed confident increase of these indicators on operated side of both groups' women: in MG – by 1,84 kg ($p < 0,001$), in CG – by 0,68 kg ($p < 0,01$). Difference of mean values of hand force index between operated and not operated sides was registered only in CG women and was – 3,49% ($p < 0,05$). In table 2 we show results of changes of segments' perimeters of main and control groups women's upper limbs under influence of rehabilitation.

Table 2. Changes of segments' perimeters of upper limbs ($M \pm m$) in main group and comparison group at rehabilitation stationary stage, cm

Indicator	MG (n=25)			CG (n=25)		
	before	after	p	before	after	p
shoulder	2,40±0,20	0,68±0,12***	<0,001	2,44±0,15	1,88±0,16	<0,001
forearm	1,80±0,16	0,32±0,09***	<0,001	1,92±0,19	1,76±0,15	>0,05
hand	1,16±0,16	0,16±0,07***	<0,001	1,34±0,11	1,32±0,11	>0,05

Notes: *** – $p < 0,001$ (comparison of final indicators of main and comparison groups).

In MG we observed reduction of swelling on operated side, comparing with initial data: in part of shoulder – by 1,72 cm ($p < 0,001$); forearm – by 1,48 cm ($p < 0,001$); hand – by 1,00 cm ($p < 0,001$). In CG swelling on operated side confidently reduced in comparison with initial data only in part of shoulder – by 0,56 cm ($p < 0,001$). At level of forearm and hand it had only tendency to reduction – by 0,16 and 0,02 cm ($p > 0,05$).

Confident difference was found in final measurements of all segments' perimeters between tested groups. In particular, swelling in shoulder part was less in MG, comparing with CG – by 1,20 cm ($p < 0,001$). In part of forearm – by 1,44 cm ($p < 0,001$), in hand – by 1,16 cm ($p < 0,001$). It confirms more positive impact of the worked out program on reduction of swelling.

Discussion

The received results confirm the data of R.T. Anderson, G.G. Kimmick, T.P. McCoy, 2012 [3], C. Arving, I. Thormodsen, G. Brekke et al., 2013 [4] about acute character of this problem and demand in early start of physical rehabilitation of patients with post mastectomy syndrome as well as opinion of researchers M.L. Martin, M.A. Hernandez, C. Avenda et al., 2011 [6], Y.H. Lin, P.J. Pan, 2012 [5] that usage of lymphatic drainage in combination with active exercises in post surgery period are effective means of swelling reduction on upper limb. The results of our work confirm opinion of specialists M.T. Pace do Amaral, M.M. Freire de Oliveira, O. Ferreira Nde, 2012 [7] about positive role of manual therapy elements in combination with physical exercises for increasing of movement's amplitude in shoulder joint on operated side. Thus, there appears important question of determination of lasting results of the worked out program for physical rehabilitation of women with PMS effectiveness.

Conclusions:

It was found that modern conception of breast cancer treatment facilitates increasing of quantity of patients, who are considered "healthy" due to formal absence of main disease's progressing though presence of complications through aggressive anticancer therapy increases. It requires active intervention of rehabilitation specialists. The worked out and tested problem-oriented physical rehabilitation program for women with post mastectomy syndrome facilitates surely better recreation of the following: movement's amplitude in shoulder joint; strength of hand flexors; as well as reduction of swelling in comparison with existing programs. All these are the key to prophylaxis of different later post mastectomy complications.

The prospects of further researches imply working out of physical rehabilitation program for women with post mastectomy syndrome after stationary stage and determination of its effectiveness.

Conflict of interests

The authors declare that there is no conflict of interests.

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