THE WHOLE BODY CRYOTHERAPY IN SPORTS INJURIES AND SPORTS RELATED PAIN SYNDROMES TREATMENT

D.BIAŁY, K.ZIMMER, A.SKRZEK , Z.ZAGROBELNY, A.KAWCZYŃSKI K.WITKOWSKI

Akademia Wychowania Fizycznego We Wrocławiu

Introduction The whole body cryotherapy has been introduced for therapeutic purposes in 1979 by prof. Yamauchi in Japan. This method was developed in Europe by prof. Fricke in Germany and prof. Zagrobelny in Poland. (1, 2)

Initially the main indications for this kind of treatment were rheumatoid and degenerative arthritis. Basing on 10 years experience in application of the whole body cryotherapy we managed to extend indications to other pathologies including sports injuries and overuse syndromes.

The main idea of the whole body cryotherapy is triggering the complex of body reactions useful in further rehabilitation procedures; among those reactions are stimulation of hormone release, stimulation of the cardiovascular system, decreasing pain level and increasing immunity level.

Cryogenic chamber is specialised device, where very low temperatures are obtained by different means of cooling. The system in use at our institute is based on the liquid nitrogen as cooling agent. (1, 2)

Program of the whole body cryotherapy consists of at least 10 exposures to the temperature from –110 to –160 C, followed by individually designed exercise program, and we proofed that kinesytherapy after low temperature application is even three times more effective then regular one. (3, 4, 5)

Material and method

We have been following up the group of 11 athletes in jujitsu and 13 karate. Initially they presented with various injuries and pain syndromes and they completed specially designed questionnaire. They were treated by cycle of ten whole body cryotherapy exposures, starting from – 110 C and lowering

temperature by 10 C everyday, until –160 C was reached. Later on they were responding the questions concerning changes in pain level and their recovery speed. They were questioned before treatment program, after first exposure, on the third, fifth and tenth day of treatment and ten days after program completion. Results were compared with similar groups treatment by traditional physiotherapy methods.

Results

In the beginning athletes demonstrated the complex of typical sufferings connected with the specificity of sports and level of training program. Initially after first three exposures to the whole body cryotherapy we have noticed significant relief of pain especially in those cases concerning small joints, e.c. joints of the hand. Further on athletes reported big reduction of muscle pain and swelling following heavy training routine. Generally participants of the program noticed significant change in self comfort and readiness for better toleration for big loading during training program.

Symptoms reported by athletes. *Table 1*

Symptoms reported	Before treatment			After the first exposure			After the third exposure			After the fifth exposure			After 10 exposure			10 days after treatment completion		
by athletes	Judo % (n)	Karate % (n)	Total % (n)	Judo % (n)	Karate % (n)	Total % (n)	Judo % (n)	Karate % (n)	Total % (n)	Judo % (n)	Karate % (n)	Total % (n)	Judo % (n)	Karate % (n)	Total % (n)	Judo % (n)	Karate % (n)	Total % (n)
Self comfort	100 (11)	100 (13)	100 (24)	(11)	(13)	(24)	45,45 (5)	15,38 (2)	29,16 (7)	0	30,76 (4)	16,16 (4)	27,27 (3)	7,69 (1)	16,16 (4)	54,54	38,36	45,83
Shoulder	18,8 (2)	7,69 (1)	12,5 (3)	18,8 (2)	7,69 (1)	12,5 (3)	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	0	4,16 (1)	9,09 (1)	0	4,16 (1)
Elbow	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	7,69 (1)	8,33 (2)	9,09 (1)	0	4,16 (1)	9,09 (1)	0	4,16 (1)
Hand	18,18 (2)	76,92 (10)	50 (12)	9,09 (1)	61,53 (8)	37,5 (9)	9,09 (1)	61,53 (8)	37,5 (9)	9,09 (1)	30,76 (4)	20,83 (5)	9,09 (1)	15,38 (2)	12,5 (3)	9,09 (1)	15,38 (2)	12,5 (3)
Hip	0	7,69 (1)	4,16 (1)	0	7,69 (1)	4,16 (1)	0	7,69 (1)	4,16 (1)	0	0	0	0	0	0	0	0	0
Knee	54,54 (6)	0,00	25 (6)	45,45 (5)	0	22,72 (5)	45,45 (5)	0	27,72 (5)	36,36 (4)	0	16,16 (4)	18,18 (2)	0	8,33 (2)	18,18 (2)	0	8,33 (2)
Ankle	0	15,38 (2)	8,33 (2)	0	15,38 (2)	8,33 (2)	0	7,69 (1)	4,16 (1)	0	0	0	0	0	0	0	0	0
Foot	18,8 (2)	30,76 (4)	25 (6)	18,8 (2)	30,76 (4)	25 (6)	18,18 (2)	23,07 (3)	20,83 (5)	18,18 (2)	7,69 (1)	12,5 (3)	0	0	0	0	0	0
Soft tissue swelling	18,18 (2)	100 (13)	83,33 (20)	0	76,92 (10)	41,66 (10)	18,18 (2)	69,23 (9)	45,83 (11)	18,18 (2)	46,15 (6)	33,33 (8)	18,18 (2)	0	8,33 (2)	18,18 (2)	0	8,33 (2)
Shee splints	63,63 (7)	100 (13)	83,33 (20)	54,54 (6)	69,23 (9)	62,5 (15)	54,54 (6)	69,23 (9)	62,5 (15)	27,27 (3)	46,15 (6)	37,5 (9)	9,09 (1)	0	4,16 (1)	9,09 (1)	0	4,16 (1)
Lumbar spine	18,18 (2)	30,76 (4)	25 (6)	18,18 (2)	30,76 (4)	25 (6)	18,18 (2)	23,07 (3)	22,72 (5)	9,09 (1)	15,38 (2)	12,5 (3)	0	7,69 (1)	4,16 (1)	0	7,69 (1)	4,16 (1)
Thoracic spine	9,09 (1)	0	4,16 (1)	9,09 (1)	0	4,16 (1)	0	0	0	0	0	0	0	0	0	0	0	0
Training load tolerance	(11)	(13)	(24)	(11)	(13)	(24)												
Training load tolerance-increased							27,27 (3)	7,69 (1)	16,66 (4)	9,09 (1)	15,38 (2)	12,5 (3)	18,18 (2)	38,46 (5)	29,16 (7)	36,36 (4)	100 (13)	70,83 (17)
Training load tolerance-decreased										63,63 (7)	61,53 (8)	62,5 (15)	36,36 (4)	23,08 (3)	29,16 (7)			

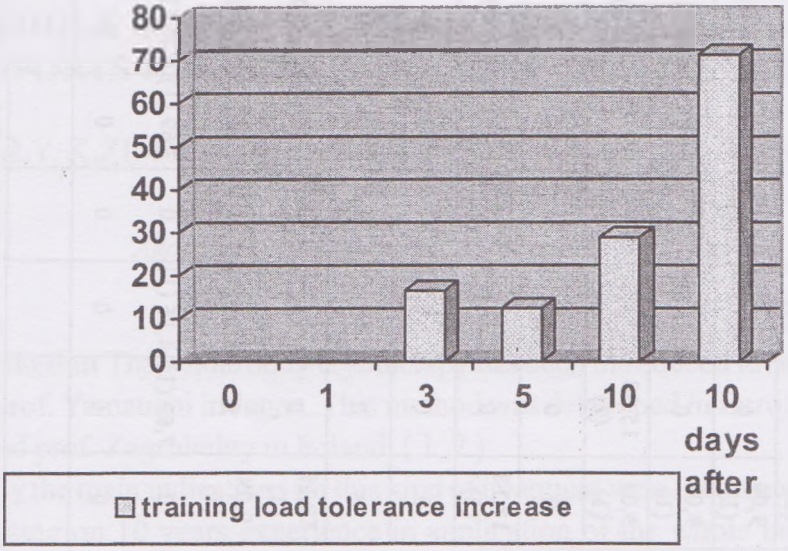

Chart 1. Percentage of training load tolerance increase

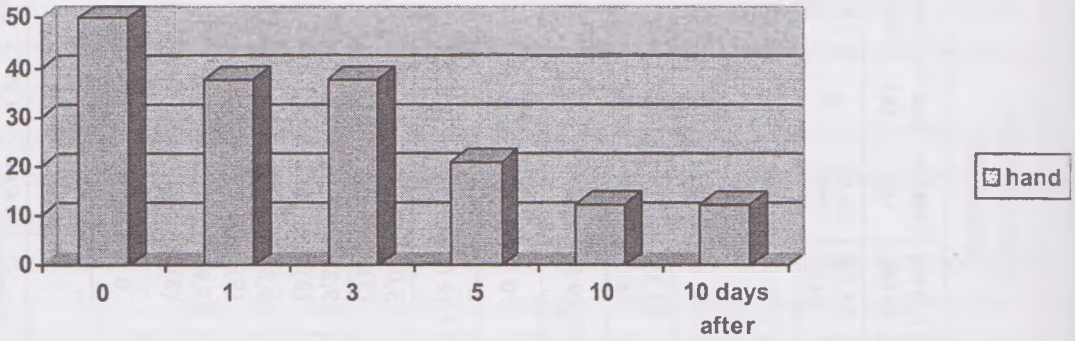

Chart 2. Reported pain relief in the area of hand

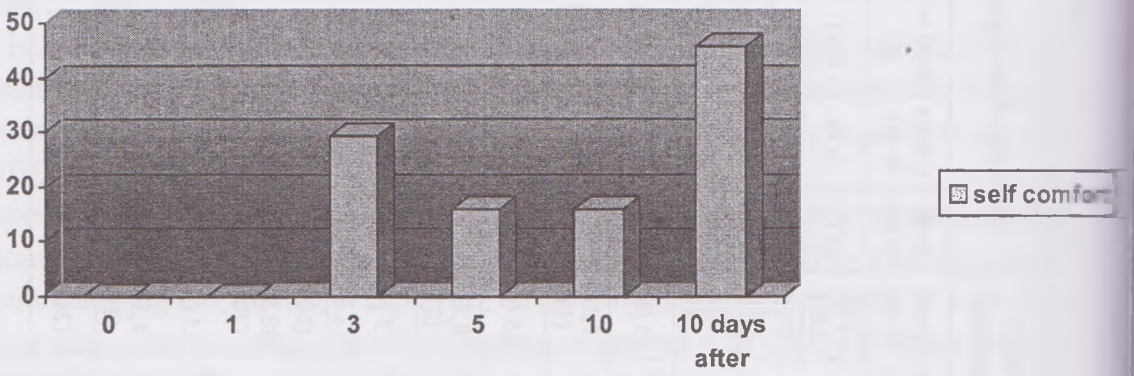

Chart 3. Self comfort improvement reported by athletes

Conclusions

1. We managed to spot significant improvement in pain level feeling and recovery speed in the group treated by the whole body cryotherapy.

2. Athletes from this group had also better tolerance for higher intensity of training what can suggest possibility of using cryochamber as very sufficient biological regeneration factor.

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A.SKRZEK

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Basing on 10 year experience in application of the whole body cryotherapy we managed to extend indications to other pathologies including sports injuries and overuse syndroms.. Program of the whole body cryotherapy consists of at least 10 exposures to the temperature from – 110 to – 160 C°, followed by individually designed exercise program. We have been following up the group of 11 athletes in jujitsu and 13 karate . Initially they presented with various injuries and pain syndromes and they completed specially prepared questionnaire. They were treated by cycle of ten whole body cyotherapy exposures and they were responding the questions concerning changes in pain level and their recovery speed. Results were compared with similar group treated with traditional physiotherapy methods. We were able to observe decreasing of pain level in upper extramitias joints by 71%, in lower extramitias joints by 87%, spine joints and ligaments by 86%. In cases of chronic muscle pain syndromes symptoms decreased by 85% and oedemas by 87%. We managed to spot significant improvement in pain level feeling and recovery speed in the group treated by the whole body cryotherapy. Athletes from this group had also better tolerance for higher intensity of training, what can suggest possibility of using cryochamber as very sufficient biological regeneration factor.
