

Assesement of changes in arterial hypertension and body weight in patients undergoing health resort therapy in „Ciche Wąwozy” in Nałęczów

Ocena zachowania się ciśnienia tętniczego i masy ciała podczas leczenia uzdrowiskowego w Sanatorium Uzdrowiskowym „Ciche Wąwozy” w Nałęczowie

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Resort Therapy in „Ciche Wąwozy” in Nałęczów

Summary

Introduction: Diseases of the cardiovascular system together with their complications are the most common reasons for hospitalization, which often leads to incapacitating the patient's normal social and family life. Untreated hypertension results in increased incidence rates of myocardial infarction and stroke, which, as target-organ complications, are the most common cause of death in many countries all over the world. Clinical research provides evidence that introducing appropriate modifications into the patient's lifestyle may be as effective as the use of a hypotensive drug. Therefore, health resort treatment, which uses the stimulatory effect of natural resources, climate and physiotherapy, may become an alternative solution. Health resort treatment enhances the patient's awareness of the benefits of health-promoting behaviours, makes them develop and establish a new, healthy lifestyle and, as a result, decrease their arterial blood pressure.

The aim of the study: Assessment of the effectiveness of health resort treatment in the management of arterial hypertension, changes in the body weight and BMI values with gender – based division of the studied population.

Material and methods: The studied group consisted of 108 patients aged 63.71 ± 7.01 years who suffered from arterial hypertension and were staying at Ciche Wąwozy health resort for 21 days. The method used in the study was the retrospective and comparative evaluation of the obtained test results of the studied patients, i.e. duration of arterial hypertension, anthropometric parameters, changes in the systolic and diastolic pressure. In addition, the incidence of co-morbidities was also compared as well as their treatment in the studied groups of male and female patients. At the last stage of the study a percentage of the ordered therapeutic procedures was also compared in both studied groups.

Results: No statistical significance was found between the duration of arterial hypertension, the kind of applied pharmaceutical treatment and incidence of co-morbidities in the male population in comparison with the female population. The percentage of the ordered therapeutic procedures was similar in both groups. However, in both studied groups a statistically significant decrease in both systolic and diastolic pressure was observed: in the male group a decrease by 24.08 mmHg (± 11.29) of the systolic pressure in comparison with the female group (21.38 mmHg ± 13.04) and a decrease in the diastolic pressure in the male group (9.04 mmHg ± 10.82) in comparison with the studied women (8.56 mmHg ± 11.33). However, the comparison between the males and females revealed no statistical significance in the decrease of this parameter. In the period of 21 days reduction of the body weight was observed in both men and women, on average 0.65kg (± 1.12) and 0.98kg (± 0.99), respectively, which turned out to be statistically insignificant between the studied groups.

Conclusions: 1. Our own results show that climatic treatment, regular physical activity and appropriate balneo-physical procedures result in the reduction of both body weight and arterial hypertension in the patients. 2. Reduction of body weight and arterial hypertension is similar in both sex groups, which results from the same effect of health resort treatment in these groups regardless of the patients' sex. 3. Health resort therapy is a good start to long-term lifestyle changes for the patients, which ultimately results in a decreased risk of metabolic syndrome development and reduction of the cardiovascular risk in those patients.

Key words: arterial hypertension, body weight, lifestyle, health resort therapy, balneophysical procedures

STRESZCZENIE

Wstęp: Choroby układu krążenia, stanowią wraz ze swoimi powikłaniami najczęstszą przyczynę hospitalizacji, co w konsekwencji prowadzi do utrudnienia w funkcjonowaniu takich chorych w wymiarze społecznym i rodzinnym. Konsekwencją nieleczonego nadciśnienia jest wzrost zachorowalności na zawał mięśnia sercowego i udar mózgu, które jako powikłania narządowe nadciśnienia tętniczego stanowią najczęstszą przyczynę zgonów w wielu krajach na całym świecie. Badania kliniczne dowodzą, że efekt hipotensyjny odpowiednio dobranych modyfikacji stylu życia może być równoważny efektem stosowania jednego leku hipotensyjnego. Wobec powyższego alternatywą może stać się leczenie uzdrowiskowe, w którym wykorzystuje się bodźcowe oddziaływanie na ustrój naturalnych surowców leczniczych, klimatu oraz zabiegów fizykalnych, co sprzyja utrwaleniu a niekiedy pokazaniu prozdrowotnego stylu życia, a w konsekwencji prowadzi do zmiany stylu życia, w tym między innymi do obniżenia ciśnienia tętniczego.

Cel pracy: Ocena skuteczności leczenia uzdrowiskowego w terapii nadciśnienia tętniczego, zmiany masy ciała oraz wskaźnika BMI z podziałem na populację mężczyzn i kobiet.

Materiał i metody: Badana grupa składała się ze 108 kuracjuszy obciążonych nadciśnieniem tętniczym w wieku $63,71 \pm 7,01$ lat przebywających na 21-dniowym turnusie sanatoryjnym. Metodą badania była ocena retrospektywna i porównawcza otrzymanych wyników badań kuracjuszy – czasu trwania nadciśnienia tętniczego, parametrów antropometrycznych, zmiany ciśnienia skurczowego i rozkurczowego. Dodatkowo porównano obecność chorób współtowarzyszących oraz modelu ich leczenia w obu badanych populacjach. Ostaniem etapem było porównanie odsetka zleconych zabiegów w obu grupach kuracjuszy.

Wyniki: Nie wykazano istotności statystycznej pomiędzy długością trwania NT, sposobu leczenia farmakologicznego, częstości chorób współtowarzyszących w populacji mężczyzn w porównaniu do grupy kobiet. Odsetek zaordynowanych zabiegów nie różnił się pomiędzy badanymi grupami. Uzyskano statystycznie istotny spadek obu wartości ciśnienia tętniczego w obu badanych grupach: obniżenie ciśnienia skurczowego w grupie mężczyzn o $24,08$ mmHg ($\pm 11,29$) w porównaniu do grupy kobiet ($21,38$ mmHg $\pm 13,04$) oraz obniżenie ciśnienia rozkurczowego w grupie mężczyzn ($9,04$ mmHg $\pm 10,82$) w porównaniu do grupy kobiet ($8,56$ mmHg $\pm 11,33$), jednakże w porównaniu pomiędzy populacją mężczyzn i kobiet nie wykazano istotności statystycznej w spadku tego parametru. Uzyskano spadek masy ciała zarówno w populacji mężczyzn średnio o $0,65$ kg ($\pm 1,12$) jak i w populacji kobiet średnio $0,98$ kg ($\pm 0,99$) w przeciągu 21 dni, co jednak nie było istotne statystycznie pomiędzy badanymi grupami.

Wnioski: 1. Wyniki badań własnych pokazują, że leczenie klimatyczne, codzienna regularna aktywność fizyczna oraz odpowiednio dobrane zabiegi balneofizykalne prowadzą do obniżenia zarówno masy ciała jak i ciśnienia tętniczego kuracjuszy.

2. Obniżenie parametrów masy ciała oraz ciśnienia tętniczego jest podobne w grupie mężczyzn i kobiet, co wynika z identycznego wpływu leczenia sanatoryjnego niezależnie od płci kuracjuszy.

3. Leczenie sanatoryjne jest dobrym początkiem długotrwałej zmiany stylu życia u kuracjuszy, co w konsekwencji prowadzi do zmniejszenia ryzyka rozwinięcia się zespołu metabolicznego, a tym samym obniżenia ryzyka sercowo-naczyniowego u tych pacjentów.

Słowa kluczowe: nadciśnienie tętnicze, masa ciała, styl życia, leczenie uzdrowiskowe, zabiegi balneofizykalne

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INTRODUCTION

It has been observed that cardiovascular diseases, regarded as one of the most common causes of death in the industrialized countries, are also the main reason for hospitalization, which often negatively affects the patients' social and family lives. The results of the Multicentre Polish Population Health Status Study (WOBASZ) conducted in the years 2003-2005 showed that the incidence of arterial hypertension (AH) was 24-50% in the male population and 24-38% in the female population [1]. These data have been confirmed by international studies in which arterial hypertension was recognized in approximately 30-45% of the general population, a positive correlation was also clearly documented between the incidence of arterial hypertension and the patients' age [2, 3, 4]. For epidemiological purposes, the approved defini-

tion of arterial hypertension (AH) and its classification was in agreement with the guidelines of both the European Society of Hypertension and European Society of Cardiology (ESH/ESC) of 2003. The guidelines were confirmed in 2013 and the blood pressure value exceeding 140/90 mmHg was recognized as arterial hypertension [5]. If left untreated, arterial hypertension will increase the incidence of myocardial infarction (MI) and stroke, two most frequent fatal organ complications worldwide. The new (ESH/ESC) guidelines of 2013 make it explicitly clear that a combination of pharmacological treatment and changes in the lifestyle not only prevent the development of arterial hypertension but they also decrease its levels in the patients already affected with this condition. Clinical studies provide hard evidence that the hypotensive effect of a well modified lifestyle (i.e. re-

duction of salt and alcohol intake, increased consumption of fruit and vegetables, consistent and permanent weight loss, regular physical exercise) may counterbalance the effect of application of a hypotensive drug [5, 6, 7]. However, the main drawback of the non-pharmacological management of arterial hypertension is the patients' poor long-term home discipline regarding therapeutic orders. Therefore, health resort treatment may be a good alternative as this type of treatment makes use of the stimulatory effect of natural resources, climate and physical rehabilitation. In the course of a 21-day resort therapy, the patients take part in an intensive education programme (lectures on healthy diet, metabolic syndrome, etc.), get used to eating healthy, well balanced meals and taking regular exercise adjusted to individual capabilities of each patient. All this, together with the climatic and physical stimuli in the resort itself, creates favourable conditions for teaching the patients health promoting behaviours that in time will become routines, bring permanent lifestyle changes and reduce arterial blood pressure.

AIM OF THE STUDY

The main aim of the study was to assess the effectiveness of health resort therapy (health promoting education, appropriate diet and physical rehabilitation) in the treatment of arterial hypertension within two populations of patients (i.e. male and female) during their 21-day stay in „Ciche Wąwozy” Nałęczów Health Resort of cardiological profile. In addition, the study aimed at assessing changes in the patients' body weight and body mass index (BMI) during their 21-day health resort therapy.

MATERIAL AND METHODS

The studied group consisted of 108 patients (53 men, 49.07%) suffering from arterial hypertension whose mean age was 63.71 ± 7.01 years and who were staying in a health resort for 21 days. The study subjects were divided into two gender-based groups – the men constituted the first group, while the women belonged to the other. The study included only those patients who suffered from arterial hypertension and whose hypotensive pharmacological treatment remained unmodified within their 21-day stay at the resort. The method of the study involved a retrospective and comparative evaluation of the results obtained by the patients. Analysis of each patient's interview and medical history enabled determining the duration of arterial hypertension in years for each patient. The anthropometric parameters were also assessed and the body mass index was calculated for individual patients both at the beginning of the 21-day resort therapy and

at its end. Later, the changes in the studied patients' systolic and diastolic pressure during their 21-day stay at the resort were also assessed. The next step involved comparing the presence of co-morbidities (i.e. lipid metabolism disturbances, stroke, myocardial infarction, heart rhythm disorders) as well as their model of treatment in the both studied populations. At the last stage of the study the percentages of the ordered therapeutic procedures in both studied groups of patients were also compared.

STATISTICAL ANALYSIS

Elaboration of the study material was performed with the use of the Microsoft Excel 2010 computer programme. The values of the analysed parameters measured on a nominal scale were characterized by means of numerosity and percentage, whereas the quantitative variables were presented by mean values and standard deviation. In order to compare the values obtained in the male and female groups, the t-Student test for independent variables was used. The differences observed between the obtained results were found to be statistically significant $p < 0.05$. The χ^2 test was used for comparing the presence of co-morbidities, model of treatment, life style and applied therapeutic procedures. The statistical analysis was performed with the use of the „Statistica v. 10” computer programme.

RESULTS

The studied group consisted of 108 patients (53 men, 49.07%) suffering from arterial hypertension whose mean age was 63.71 ± 7.01 years and who were staying at a Nałęczów health resort for 21 days. No statistical significance was found between the duration of arterial hypertension in the group of male patients (8.26 ± 2.97 years) in comparison to the female group (8.42 ± 5.97 lat) (Table 1). Analysis of the anthropometric parameters in the studied groups of patients revealed a decrease in the body weight in both male and female populations by 0.65kg on average (± 1.12). In the female population the decrease was 0.98kg (± 0.99) on average during the 21-day stay. This, however, was not statistically significant between the studied groups. Comparing the BMI values obtained at the beginning of the resort therapy and the BMI values observed at the end of therapy did not reveal any statistically significant changes in this index values within the time window of 21 days (Table 2). The next stage of the study involved assessing the systolic and diastolic pressure at the beginning of the therapy and after 21 days. A statistically significant decrease in both systolic and diastolic values of arterial blood pressure was observed in both

Table 1. Comparative analysis of the studied patients.

Investigated parameter	Total group (n=108)		Male population (n=53)		Female population (n= 55)		t Value	Significance Level
	Mean	SD	Mean	SD	Mean	SD		
Patients' Age [years]	63.71	± 7.01	63.02	± 6.41	64.38	± 7.47	-1.01	p=0.32
AH Duration [years]	8.34	± 4.75	8.26	± 2.97	8.42	± 5.97	-0.17	p=0.87

Table 2. Comparative analysis of BMI and systolic/diastolic blood pressure changes in both studied populations undergoing a 21-day health resort therapy.

Investigated parameter	Male population (n=53)		Female population (n= 55)	
	t Value	Significance Level	t Value	Significance Level
BMI calculated AT the onset of therapy [kg/m ²]	0.27	0.79	0.35	p=0.73
BMI calculated at the end of therapy[kg/m ²]				
Systolic pressure at the onset of therapy [mmHg]	12.44	p<0.0001	10.10	p<0.0001
Systolic pressure at the end of therapy [mmHg]				
Diastolic pressure at the onset of therapy [mmHg]	5.92	p<0.0001	4.80	p<0.0001
Diastolic pressure at the end of therapy [mmHg]				

Table 3. Comparative analysis of BMI and systolic/diastolic blood pressure changes between the studied groups during a 21-day health resort therapy.

Investigated Parameter	Total group (n=108)		Male population (n=53)		Female population (n= 55)		t Value	Significance Level
	Mean	SD	Mean	SD	Mean	SD		
BMI calculated at the onset of therapy [kg/m ²]	29.57	±4.87	29.18	±3.95	29.35	±5.63	-0.18	p=0.86
BMI calculated at the end of therapy [kg/m ²]	28.97	±4.87	28.97	±3.98	28.98	±5.59	-0.01	p=0.99
Systolic pressure at the onset of therapy [mmHg]	147.72	±9.76	148.81	±9.44	147.05	±9.99	0.93	p=0.35
Systolic pressure at the end of therapy [mmHg]	84.62	±8.82	85.13	±8.06	84.09	±9.47	0.61	p=0.54
Diastolic pressure at the onset of therapy [mmHg]	125.21	±11.15	124.74	±10.27	125.67	±11.92	-0.43	p=0.67
Diastolic pressure at the end of therapy [mmHg]	75.81	±8.33	76.09	±7.49	75.53	±9.07	0.35	p=0.73
Changes in systolic pressure within 21 days [mmHg]	-22.70	±12.29	-24.08	±11.29	-21.38	±13.04	-1.13	p=0.25
Changes in diastolic pressure within 21 days [mmHg]	-8.80	±11.09	-9.04	±10.82	-8.56	±11.33	-0.22	p=0.83

Table 4. Comparative analysis of the percentage of co-morbidities in the studied patients.

Co-morbidities	Total group (n=108)		Male population (n=53)		Female population (n= 55)		Female population (n= 55)	Level of Significance
	%	n	%	n	%	n		
Cardiac Ischaemia	39.81	43	50.94	27	29.09	16	1.65	p=0.20
Heart rhythm disorders	11.11	12	15.09	8	7.27	4	0.66	p=0.42
Lipid metabolism disorders	65.74	71	75.58	39	58.18	32	0.08	p=0.77
Diabetes mellitus type 2	20.37	22	24.53	13	16.63	9	0.03	p=0.86
Myocardial infarction	22.22	24	30.19	16	14.55	8	1.40	p=0.24
Paralytic stroke	1.85	2	1.89	1	1.82	1	0.02	p=0.89
Degenerative articular changes	60.19	65	60.38	32	60.00	33	0.29	p=0.60

studied groups of patients during their 21-day stay at the health resort (Table 2): the change in the systolic pressure values in the males was - 24.08 mmHg (± 11.29) in comparison to the group of females: - 21.38 mmHg (± 13.04), and the change in the values of the males' diastolic pressure turned out to be - 9.04 mmHg (± 10.82) in comparison to the female

group: - 8.56 mmHg (± 11.33) (Table 3). However, comparing the male and female populations in this respect did not result in detecting any statistical significance with reference to this parameter, which is demonstrated in Table 3. Next, the percentage of co-morbidities present in the patients was subjected to analysis, however, in this respect no statistical

Table 5. Model of pharmacological treatment in the studied groups of patients.

Oral therapy model	Total group (n=108)		Male population (n=53)		Female population (n= 55)		Test X ²	Level of Significance
	%	n	%	n	%	n		
Angiotensin–converting–enzyme inhibitor (ACEI)	54.63	59	54.72	29	54.55	30	0.33	p=0.53
Beta – blocker	71.30	77	71.70	38	70.91	39	0.12	p=0.72
Calcium channel blocker	26.85	29	28.30	15	25.45	14	0.44	p=0.50
Diuretic	25.00	27	28.30	15	21.82	12	0.50	p=0.48
Angiotensin receptor antagonist II (ARB)	35.19	38	35.85	19	34.55	19	0.19	p=0.66
Statin	66.67	72	73.58	39	60.00	33	0.08	p=0.77
Acetylsalicylic acid	33.33	36	43.40	23	23.64	13	0.05	p=0.82

Table 6. Comparative analysis of the percentage of physical activity frequency and smoking cigarettes.

Chronic complication	Total group (n=108)		Male population (n=53)		Female population (n= 55)		Test X ²	Level of Significance
	%	n	%	n	%	n		
Smoking cigarettes	17.59	19	22.64	12	12.73	7	0.32	p=0.57
Physical activity Frequent (> 3 x a week)	9.26	10	7.55	4	10.91	6	0.55	p=0.46
Physical activity 2 x a week	38.89	42	45.28	24	32.73	18	0.01	p=0.93
Physical activity 1 x a week	42.59	46	39.62	21	45.45	25	0.01	p=0.94
Lack of physical activity	9.26	10	7.55	4	10.91	6	0.55	p=0.46

significance was found between the groups, either. Lipid metabolism disturbances were the most frequent co-morbidity observed in both male (75.58%) and female (58.18%) populations of the studied patients, whereas a stroke was shown to be the least frequent co-morbidity in the studied groups, 1.89% versus 1.82%, respectively (Table 5). Another stage of the study involved analyzing the model of pharmacological treatment of both arterial hypertension and co-morbidities in the studied patient groups. Beta-blockers appeared to be most frequently used in the applied pharmacotherapy, 71.70% in the male group and 70.91% in the female group, respectively. However, no statistically significant differences were observed with regard to the antihypertensive treatment between both studied groups (Table 6). Co-morbidities were most frequently treated with statins, 73.58% versus 60.00%, respectively. However, no statistical significance was found between the studied groups in this respect. The patients' lifestyle before their therapy at the health resort (i.e. at home) was also assessed, including their physical activity routines. The patients who exercised twice a week constituted the most numerous group, 45.28% of males and 32.73% of females, respectively, which was of no statistical significance. 12 men and 7 women admitted to active smoking, which was not statistically significant, either. The final stage

of the study involved assessing the percentage of the ordered therapeutic procedures, both physical and balneological in the studied groups. Each patient took part in the daily cardiological gymnastics adjusted to the individual patient's physical capabilities. Local cryotherapy was the most rarely applied procedure among the male patients (1.89%), while in the female group, the sollux lamp radiation was the least frequent form of therapy (5.45%) (Table 7).

DISCUSSION

Health resort medicine, which is an integral part of the contemporary health care, should follow hospital or ambulatory care since a 21-day stay at a health resort provides ideal conditions for teaching the patient health promoting behaviours and gives them an opportunity to take advantage of the beneficial stimulatory effects of the natural therapeutic resources, climate and physical therapy procedures [8]. The therapeutic methods used in the resort treatment are of the stimulatory character and therefore, they help the human body develop adaptive and compensatory responses. Providing the patients with specific therapeutic procedures during a 3-week period of time allows the body to retune itself and leads to the restoration of correct bodily balance. Moreover, as a result of the use of balneological stimuli, many functions

Table 7. Comparative analysis of the percentage of ordered balneological and physical procedures in the studied groups.

Type of procedure	Total group (n=108)		Male population (n=53)		Female population (n= 55)		Test X ²	Level of Significance
	%	n	%	n	%	n		
Cardiological gymnastics	100.00	108	100.00	53	100.00	55	–	–
Stationary bicycle	31.48	34	39.62	21	23.64	13	0.31	p=0.58
Treadmill training	16.67	18	24.53	13	9.09	5	0.01	p=0.98
Nordic Walking	8.33	9	3.77	2	12.73	7	0.32	p=0.57
Hypertonic saline inhalation	36.11	39	33.96	18	38.18	21	0.77	p=0.38
Mud Ionophoresis	27.78	30	28.30	15	27.27	15	3.48	p=0.07
Dry bath CO ₂	62.96	68	60.38	32	65.45	36	1.86	p=0.17
Iodine–bromine bath	37.04	40	37.74	20	36.36	20	0.52	p=0.47
Peat Poultrice	39.81	43	37.74	20	41.82	23	0.16	p=0.69
Laser therapy	29.63	32	33.96	18	25.45	14	3.28	p=0.07
Electrical procedures	27.78	30	24.53	13	30.91	17	0.64	p=0.42
Magnetic field	37.04	40	33.96	18	40.00	22	0.45	p=0.50
Sollux Lamp	5.56	6	5.66	3	5.45	3	0.19	p=0.66
Local cryotherapy	6.48	7	1.89	1	10.91	6	0.13	p=0.72
Manual massage	75.93	82	75.47	40	76.36	42	0.02	p=0.89
Pearl Bath with ozone	16.67	18	18.87	10	14.55	8	0.25	p=0.62
Whirlpool Bath with ozone	31.48	34	26.42	14	36.36	20	0.44	p=0.51

of the body improve their efficiency [9]. However, in order to obtain the desired effect, the patient should undergo several series of therapeutic procedures (about 7 – 12) applied on a regular basis which together with everyday physical activity and health promoting education will contribute to the patient's maintaining healthy lifestyle.

The studied groups that were subjected to analysis consisted of 108 patients suffering from arterial hypertension and whose hypotensive treatment was not modified during their 21-day resort therapy. Both of the studied groups did not vary with respect to the patients' age, AH duration, the presence of co-morbidities, lifestyle, (frequency of physical exercise, smoking) and type of applied therapeutic procedures, which rules out an additional possibility of other parameters affecting the parameter of arterial hypertension and body weight in the process of conducting the statistical analysis.

Each patient had a daily, regular keep-fit cardiological gymnastics session based on a lesson-model and in agreement with the exertion curve adjusted adequately to the patient's physical capabilities. In addition, besides receiving appropriate physical-balneological therapeutic procedures, each patient took daily walks in the Nałęczów countryside. The results obtained in this study present a statistically significant decrease in the systolic and diastolic pressure values in both studied groups of patients during their 21-day stay at the resort, however, no statistically significant difference was observed between the male and female groups. A correlation between the resort therapy (the climate, physical and balneological therapeutic procedures) and decreased arterial blood pressure in the patients subjected to it has been confirmed by the medical literature many times. It has also been confirmed by the research conducted in other Polish

resorts and its results demonstrate the positive effect of resort treatment on a significant decrease in the arterial blood pressure values in the patients undergoing resort therapy [10 – 11]. Gapon and Ignatow have emphasized the beneficial effect of dry gas baths (CO₂) on the 24-hour arterial blood pressure profile in the post-myocardial infarction patients [13], and this was also confirmed by the studies conducted in the Polish resort of Sopot [14] and Horyniec Zdrój [15]. It is worth noting that there is no statistical significance with regard to the decrease of arterial blood pressure between the males and females; this observation, however, may be explained by the impact of the climate, provided therapeutic procedures as well as everyday physical activity regardless of the patients' sex. The climatic treatment, health promoting education in the course of resort therapy together with daily, regular exercise resulted not only in a decrease of arterial blood pressure in the patients during their 21-day long therapy but they also reduced the patients' body weight, which should encourage them to continue their lifestyle changing efforts. The beneficial effect of taking daily, regular exercise on the 24-hour blood pressure profile has been reported and confirmed many times and physical activity as a cardiovascular risk reducing factor has been well documented [16,17]. It is worth remembering that taking regular exercise leads to better adaptation of the circulatory system and protection of both the heart muscle and blood vessels, it reduces not only the arterial blood pressure or body weight but also slows down the heartbeat and decreases the energy demand of the heart. During physical activity the oxygen transport to the tissues increases, the lipid profile in the serum gets changed (LDL-cholesterol and triglyceride fraction is decreased, HDL-cholesterol fraction is increased) and the carbohydrate content in the serum is reduced. All this is of great importance in the process of preventing the development of metabolic syndrome that has been observed much more often in the resort therapy patients in the recent years and one should bear in mind that arterial hypertension is one of its components. The importance of meeting the criteria of metabolic syndrome in the development of the cardiovascular risk factor has been confirmed in scientific studies and it appears to be more powerful than the risk of all its components put together [18]. Therefore, it becomes essential to make the patients realize how long-term changes in their lifestyle may reduce the likelihood of a cardiovascular event occurrence in the future. Having made the decision about changing their lifestyle, the patients find it very hard to realize their goals, especially within the first few weeks. Therefore, spending this time in a health resort appears to be an excellent solution since it is here that the patients get health promoting education, develop the habit of eating well balanced meals, take regular physical exercise and are provided with physical and stimulatory therapy procedures that together with the benefits of the climate will help them overcome initial hardships and maintain the new, changed lifestyle. Another advantage of spending time at a health resort is that each patient meets other patients here and realizes that he/she does not have to put up with his/

her affliction alone. This may be very helpful in realization of their goals. However, the most important information for the patients should be that permanent changes in their lifestyle, together with reduced body weight and arterial blood pressure, will undoubtedly lead to the reduced risk of developing the metabolic syndrome and decrease the likelihood of occurrence of the cardiovascular risk in those patients.

CONCLUSIONS:

1. Our own results show that climatic treatment, regular physical activity and appropriate balneo-physical procedures result in the reduction of both body weight and arterial hypertension in the patients.
2. Reduction of body weight and arterial hypertension is similar in both sex groups, which results from the same effect of health resort treatment in these groups regardless of the patients' sex.
3. Health resort therapy is a good start to long-term lifestyle changes for the patients, which ultimately results in a decreased risk of metabolic syndrome development and reduction of the cardiovascular risk in those patients.

Lista stosowanych skrótów:

BMI	wskaźnik masy ciała (body mass index)
ESC	Europejskie Towarzystwo Kardiologiczne (European Society of Cardiology)
ESH	Europejskie Towarzystwo Nadciśnienia Tętniczego (European Society of Hypertension)
HDL	lipoproteiny wysokiej gęstości (High Density Lipoprotein)
LDL	lipoproteiny niskiej gęstości (Low Density Lipoprotein)
NT	nadciśnienie tętnicze (arterial hypertension)
WOBASZ	Wieloośrodkowe Ogólnopolskie Badanie Stanu Zdrowia Ludności

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Informacja prasowa

Na ratunek włosom

H-STIMUPURIN - specjalistyczny szampon stymulujący wzrost włosów. Szampon opracowany specjalnie dla kobiet i mężczyzn z problemem nasilonego okresowego i przedwczesnego wypadania włosów. Pomaga walczyć z łysieniem o podłożu genetyczno-hormonalnym (łysienie androgenowe) oraz spowodowanym czynnikami środowiskowymi. Skutecznie zapobiega utracie włosów wynikającej z długotrwałego przyjmowania leków, stresu, przemęczenia, osłabienia organizmu (diety) oraz po ciąży. Bezpieczny dla wrażliwej skóry głowy.

Pierwsze na rynku unikalne połączenie dwóch składników Naturalnego Czynnika Wzrostu FGF oraz kofeiny (aktywne zgłoszenie patentowe), stanowi skuteczne i naukowo udowodnione działanie, hamujące proces wypadania włosów i jednocześnie stymulujące ich odrastanie. Składniki kompleksu działają na poziomie komórkowym aktywując geny odpowiedzialne za proces budowy nowego włosa. Pobudzają jednocześnie aktywność życiową istniejących mieszków włosowych, przyspieszając naturalny wzrost włosów i wydłużając ich cykl życia (fazę anagenu). Kofeina zapobiega uwarunkowanemu genetycznie łysieniu, neutralizując negatywny wpływ hormonów (androgenów, DHT) odpowiedzialnych za degradację włosów i przedwczesne wypadanie. Starannie dobrane składniki kondycjonujące: niacynamid (wit. PP), D-Pantenol oraz biotyna działają łagodząco przywracając fizjologiczną równowagę skóry głowy. Szampon delikatnie i skutecznie oczyszcza włosy i skórę głowy. Wygładza strukturę włosa, wzmacnia i przywraca ich naturalną gęstość. Posiada pH neutralne dla skóry. W celu zwiększenia efektywności działania stosować łącznie z odżywką Pharmaceris H-STIMULINUM.

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