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## Clinical efficacy of omega-3 polyunsaturated fatty acids and rosuvastatin in combination therapy for patients with psoriasis and metabolic syndrome

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### Abstract

Based on the examination and treatment of 100 patients with moderate psoriasis associated with metabolic syndrome, it was established that the use of narrowband UVB-therapy combined with rosuvastatin and omega-3 polyunsaturated fatty acids in combination therapy contributes to the improvement of the efficacy of therapy for dermatosis, induces a long-term remission and improves the life quality of patients.

**Keywords:** psoriasis, metabolic syndrome, omega-3 polyunsaturated fatty acids, rosuvastatin

### Introduction

Psoriasis is a chronic, immune-mediated dermatological disease associated with substantial economic, clinical, and humanistic burden [5]. Although the systemic nature of psoriasis often remains unrecognized, the inflammatory processes involved may be associated with the development of co-morbidities [10]. Most researchers believe that the development of pathological processes in psoriasis is limited not only to the skin involvement but causes the disturbance of different organs and systems functions [3, 9].

Metabolic syndrome is a clustering of risk factors, such as central obesity, insulin resistance, dyslipidemia and hypertension that together culminate in the increased risk of type 2 diabetes mellitus and cardiovascular disease [6, 8]. Recently it has been proved that metabolic syndrome (MS) affects the course of psoriasis [1, 11]. In view of this, it is necessary to investigate the efficacy of lipid-lowering drugs omega-3 polyunsaturated fatty acids (PUFA) and rosuvastatin in combination therapy for patients with psoriasis. In dyslipidemia statins have proved to be an effective treatment because, besides the lipid-lowering effect, they also possess pleiotropic effects [2, 4]. Omega-3 PUFA show hypolipidemic and anti-inflammatory activities due to the antagonistic action against arachidonic acid and its metabolites [7, 12].

The purpose of this investigation was to study the efficacy of combination therapy including narrowband UVB-therapy, statins and omega-3 PUFA for the treatment of moderate psoriasis associated with metabolic syndrome.

### Materials and methods

We made observation on 100 (62 male and 38 female) patients with moderate plaque psoriasis associated with MS. The disease duration ranged from 1 to over 20 years. Progressive stage was diagnosed in 12 (12%) patients, stationary stage – in 88 (88%) patients. 30 (12 male and 8 female) apparently healthy persons were included into the control group. Index PASI (*Psoriatic Area and Severity Index*) was used to measure psoriasis severity. DLQI (*Dermatology Life Quality Index*) was used to measure the life quality. MS was diagnosed on the basis of the criteria of the International Diabetes Federation (2005). Examinations were performed at the onset of treatment, 1 and 3 months after the treatment onset. A long-term outcome was evaluated 12 months after the treatment onset.

Depending upon the performed treatment all patients were divided into 3 groups. Group 1 patients (n = 26) received background therapy for psoriasis according to Order of the Minister of Health No 312/08.05.2009. The therapy included phototherapy using N-Line *pro* cabin (Saalmann medical GmbH, Germany) and 15 sessions of narrowband UVB-therapy (311 nm emission): five first sessions were made every day, subsequent sessions were made alternate days. Group 2 patients received the same treatment as group 1 patients and additionally rosuvastatin “Roxera” (Krka, Slovenia, registration number UA/11743/01/02, validity from

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05.10.2011 till 05.10.2016) in a dose of 10 mg per day for 3 months. Later group 2 was subdivided into group 2a (n = 13) (patients of this subgroup discontinued treatment) and group 2b (n=12) (patients of this subgroup continued to receive a previous dose of rosuvastatin for a year).

Group 3 patients received the same treatment as group 1 patients and additionally omega-3 PUFA “Epadol-Neo” (PC “Kyiv Vitamin Factory”, Ukraine, registration number UA/12187/01/01, validity from 23.05.2012 till 23.05.2017) in a dose of 2 g per day (2 capsules per day) for 3 months. Later group 3 was subdivided into group 3a (n=14) (patients of this subgroup discontinued treatment), and group 3b (n=11) (patients of this subgroup continued to receive omega-3 PUFA in a dose of 1 g per day for a year). Group 4 patients received the same treatment as group 1 patients and additionally rosuvastatin “Roxera” in a dose of 10 mg per day and omega-3 PUFA “Epadol-Neo” in a dose of 1 g per day for 3 months. Later group 4 was subdivided into group 4a (n=12) (patients of this subgroup discontinued treatment) and group 4b (n=12) (patients of this subgroup continued to receive a previous dose of rosuvastatin and omega-3 PUFA in a dose of 1 g per day for a year). Statistical data processing was made on the personal computer using a computer program “Statistica 7.0 for Windows”.

**Results and their discussion**

On the treatment completion we observed a positive dynamics of psoriasis clinical manifestations with the decrease in the PASI score in patients from all groups (Table 1). Influenced by the background therapy the PASI score decreased by 47.4% (p<0.05) in Group 1 patients as compared to the input data, but after 3 months of therapy the PASI score increased and was less as compared to the input data by 37.1% (p<0.05). 12

months after the therapy onset the clinical findings of these patients worsened, the PASI score increased to 20.74±1.93, that didn't differ significantly from that in the input data (p>0.05).

In group 2 patients the PASI score decreased after 1 month of treatment by 66.4% (p<0.05) as compared to the input data. After 3 months of treatment the PASI score decreased as compared to the input data by 67.8% (p<0.05). 12 months after the therapy onset the clinical findings of group 2a patients worsened, the PASI score increased to 12.93±1.05 and was less when comparing to the input data by 44.2% (p<0.05). But in group 2b patients the PASI score was 9.35±0.52 and was less than that in the input data by 59.7% (p<0.05).

Influenced by the background therapy and epadol the PASI score decreased by 56.8% (p<0.05) in Group 3 patients as compared to the input data, 3 months after the treatment onset the PASI score continued decreasing and was less by 58.8% (p<0.05) when comparing to the input data. 12 months after the therapy onset the clinical findings of group 3a patients worsened, the PASI score increased to 16.31±1.24 and was less by 28% (p<0.05) when comparing to the input data. But in group 3b patients the PASI score decreased by 52.8% (p<0.05).

In group 4 patients the PASI score decreased by 74.3% (p<0.05) as compared to the input data, 3 months after the treatment onset the PASI score continued decreasing and was less by 76.4% (p<0.05) when comparing to the input data. After 12 months after therapy onset in group 4a patients the PASI score increased to 10.75±0.83 and was less by 56.2% (p<0.05) than that in the input data. But in group 4b patients the PASI score decreased by 70.6% (p<0.05) as compared to the input data.

**Table 1:** The PASI score dynamics influenced by the combination therapy for patients with psoriasis with the use of rosuvastatin and omega-3 polyunsaturated fatty acids in the combination therapy

Groups of patients	PASI score				
	Before treatment	1 month after the treatment onset	3 months after the treatment onset	After 12 months of therapy	
				a subgroups	b subgroups
Group 1, n=26	22.45±1.35	11.81±0.67 (-47.4%)*	14.12±1.06 (-37.1%)*●	20.74±1.93 (-7.6%)°	-
Group 2, n=25	23.18±1.50	7.78±0.59 (-66.4%)*"◆■	7.46±0.65 (-67.8%)*"◆■	12.93±1.05 (-44.2%)*°"◆■	9.35±0.52 (-59.7%)*°◆■
Group 3, n=25	22.65±1.43	9.86±0.64 (-56.5%)*"◆	9.32±0.73 (-58.8%)*"◆	16.31±1.24 (-28.0%)*°"◆	10.68±0.73 (-52.8%)*°◆
Group 4, n=24	24.53±1.72	6.30±0.52*"◆	5.78±0.46*"◆	10.75±0.83*°"◆	7.22±0.55*°◆

**Notes:** \* – statistically significant differences from the index before treatment  
 ● – statistically significant differences 1 and 3 months after the treatment onset,  
 ° – statistically significant differences 3 and 12 months after the treatment onset;  
 " – statistically significant differences in Groups 2, 3, 4 as compared to Group 1 at an appropriate period of treatment  
 ◆ – statistically significant differences in Groups 2 and 3 as compared to Group 4 at an appropriate period of treatment  
 ■ – statistically significant differences in Groups 2 and 3 at an appropriate period of treatment

The PASI score decrease by 75%-99% and the patient's complaints absence were considered as high efficiency of treatment, the PASI score decrease by 50%-74% – satisfactory efficiency of treatment, the PASI score decrease by 25-49% – moderate efficiency of treatment, the PASI score decrease by 24-15% – low efficiency of treatment, the PASI score decrease

by less than 12% and no changes in complaints – absence of efficiency.

Our investigation showed that the combination therapy efficiency was the highest in Group 4 patients. These patients additionally took rosuvastatin and omega-3 polyunsaturated fatty acids in combination therapy (Table 2).

**Table 2:** Findings of efficiency evaluation of combination therapy for psoriasis with the use of rosuvastatin and omega-3 polyunsaturated fatty acids 3 months after the treatment onset

Efficiency	Group 1, n=26	Group 2, n=25	Group 3, n=25	Group 4, n=24
High efficiency	-	4 (16.0%)	3 (12.0%)	6 (25.0%)
Satisfactory efficiency	6 (23.1%)	11(44.0%)	10(40.0%)	11 (45.8%)
Moderate efficiency	11(42.3%)	7 (28.0%)	7 (28.0%)	6 (25.0%)
Low efficiency	7 (26.9%)	2 (8.0%)	4 (16.0%)	1 (4.2%)
Lack of efficiency	2 (7.7%)	1 (4.0%)	1 (4.0%)	-

Thus, the combination therapy including UVB-therapy with the use of rosuvastatin and omega-3 polyunsaturated fatty acids proved to be the most efficient treatment for psoriasis associated with MS. The length of treatment decreased and the remote treatment results improved due to the combination therapy. DLQI (*Dermatology Life Quality Index*) was used to measure the life quality. A DLQI total score of less than 10 demonstrates a moderate impairment of the life quality, a

DLQI total score of more than 10 demonstrates a significant impairment of the life quality. Based on the results of the life quality assessment using the DLQI score, it was established that a total DLQI score decreased in all patients, but in Group 2, 3 and most significantly in Group 4 patients the decrease was more pronounced (Table 3). We noted that a rather high life quality was observed in Group 4 patients in the remote period of treatment.

**Table 3:** The PASI score dynamics influenced by the combination therapy for patients with psoriasis with the use of rosuvastatin and omega-3 polyunsaturated fatty acids in the combination therapy

Groups of patients	PASI score				
	Before treatment	1 month after the treatment onset	3 months after the treatment onset	12 months after the treatment onset	
				a subgroups	b subgroups
Group 1, n=26	15.15±1.31	10.21±0.74*	11.44±0.82*	14.29±1.08°	-
Group 2, n=25	15.56±1.27	5.58±0.44 **◆	5.72±0.57 **◆	10.43±0.64 *°◆	7.28±0.45 *°◆
Group 3, n=25	14.84±1.22	8.53±0.62 **◆■	6.81±0.53 **◆	11.85±0.69 *°◆	7.84±0.63 *°◆
Group 4, n=24	15.22±1.38	4.18±0.27 **	2.55±0.22 **	8.56±0.72 *°	5.61±0.43 *°

**Notes:** \* – statistically significant differences from the index before treatment  
 ● – statistically significant differences 1 and 3 months after the treatment onset,  
 ° – statistically significant differences 3 and 12 months after the treatment onset;  
 ° – statistically significant differences in Groups 2, 3, 4 as compared to Group 1 at an appropriate period of treatment  
 ◆ – statistically significant differences in Groups 2 and 3 as compared to Group 4 at an appropriate period of treatment  
 ■ – statistically significant differences in Groups 2 and 3 at an appropriate period of treatment

Consequently, the use of lipid-lowering drugs rosuvastatin and omega-3 PUFA in combination therapy for patients with psoriasis associated with MS contributed to the improvement of treatment efficacy and life quality of patients. A long-term use of these medicines for a year caused more prolonged remission.

**Conclusions**

The use of narrowband UVB-therapy combined with rosuvastatin and omega-3 polyunsaturated fatty acids in combination therapy for the treatment of moderate psoriasis contributes to the treatment efficacy improvement, induces a long-term remission, and improves the life quality of patients.

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