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Serum lipid profile in psoriatic females

Profil lipidowy kobiet z łuszczycą

There are many theories of the pathogenesis of psoriasis. One of the considered theories is the one of biochemical disturbances causing numerous transformations, including a lipid one (6, 8, 9, 11–14, 16, 17). Feretti et al. (6) have observed association between psoriasis and abnormal plasma lipid composition and fluidity. However, at present, it has not been established whether the lipid alterations are primary events or a consequence of an abormal metabolism of the inflamed skin. Moreover, Simonetti et al. (6) observed an increase in fluidity in keratinocytes isolated from the skin of psoriatic patients. Many data point out to the lipid metabolism abnormalities during the course of psoriasis suggesting that the perturbation of lipid metabolism may be a generalised phenomenon in psoriasis related not only to the corneous layer of epidermis (6, 9). It is known that the composition of lipid and plasma lipoprotein change in people along with age (1, 2, 4, 15). Futhermore, the existence of numerous differences among blood lipids in women and men was stated (2, 15). The variability of lipid concentrations in women is partly conditioned by changes related to age hormonal homeostasis (2, 13). The ratio of lipid transformation varies depending on the phase of the menstruation or ovulation cycle. Besides, even on the skin surface the dynamics of lipid behaviour depends on the phase of a cycle (4, 13). The components of the lipid–transport system in an individual fluctuate (4). What is more, the genetic disposition of an individual, environmental influences such as diet, hormones, physical activity, and circadian rhythms affect lipoprotein metabolism (1, 4). It seems that in the face of the above–mentioned differences, the investigation of the lipid transformation in blood serum should be conducted for psoriatic women and men separately. Most of the investigation into blood lipids in psoriatic patients was carried out in men. Only recently, psoriatic women have been included in the research (5, 10, 11, 12).

The results giving evidence of an increase, decrease in the ratio change, or lack of ratio change are found in the papers on the problem of deviations of parameters in the lipid balance in blood serum. In the investigated groups of male patients suffering from psoriasis most often a hypertriglyceridermia or the rise in TG concentration in VLDL fraction, or a higher level in triglycerides and phospholipids, both in VLDL and in LDL, and a decrease in HDL cholesterol were described (3, 6, 9, 16, 17). In the present study, we aimed at estimating serum lipid levels in female psoriatic groups and compared them with those in healthy women.

MATERIAL

15 female normolipidemic patients suffering from psoriasis as well as 28 female healthy normolipidemic volunteers were included in the study. The age of the control group was from 15 to 42, mean 24.07 ± 6.55. The age of the patients' group was from 15 to 44, mean 23.33 ± 9.80. The onset of the disease was from 6 to 35 months, mean 16.33± 7.23. The Body Mass Index (BMI) of the control group was from 17.97 to 25.16, mean 20.963 ± 1.980 and in psoriatic female was from 14.57 to 38.20, mean 23.250 ± 5.760. The patients were on a hospital diet. They were treated neither topically nor generally with medicines which might influence lipid metabolism. None of the examined women took contraceptive pills. The study groups and the control group were age- and BMI-matched. The patients had from moderate to severe psoriasis (PASI SCORE from 18.0 – 48.0; mean 26.46 ± 7.29), the type of psoriasis from nummular and/or placibus to erythroderma. The extent of psoriasis was evaluated by the same investigator.

METHODS

Blood samples were taken after 12 hr–overnight fast on the standard procedure. We examined the following lipid serum parameters: total cholesterol, HDL cholesterol, LDL cholesterol, total phospholipids, HDL phospholipids, LDL phospholipids, triglycerides and all other routine parameters on the fresh blood. Concentrations of lipid profiles were assayed using the ready–made reagent kits by bio–Mérieux, France: LDL Cholesterol/Phospholipides; HDL Cholesterol/Phospholipides; Cholesterol enzymatique PAP; Phospholipides enzymatiques PAP; Triglycerides enzymatiques UV 250, in accordance with the producer's instructions. As reference Precinorm and Lyotrol N were used.

STATISTICAL ANALYSIS

All the results are expressed as mean ± standard deviation. The statistical analysis included the calculation of mean value, the evaluation of the significance of difference with a Student's test, Cochran and Cox test and also a variance analysis ($p = 0.05$ was accepted as a significance level) and the analysis of correlation with Spearman test ($p = 0.05$ being a significance level).

RESULTS

The comparison of the results obtained from both group is presented in Table 1. It was found that total cholesterol, total phospholipids values are lower in the examined group as opposed to the control group and HDL–cholesterol as well as HDL–phospholipids are significantly lower compared to the control group. An increase in total triglyceride concentration were stated in psoriatic group (ns). The results of our analysis suggest the existence of lipid disorders in psoriatic females.

In a female group of psoriatic patients a correlation between BMI and FLDL, $r = 0.267857$, $p = 0.048161$ was observed, also correlations between the percent of the area of the body changed with lesions, $r = 0.398949$, $p = 0.011546$. In the analysis of lipid parameters and PASI we observed the existence of correlation between PASI and HDL cholesterol $r = 0.440780$, $p = 0.006954$.

Tab. 1. Concentrations (mg%) of total cholesterol, HDL–cholesterol, LDL–cholesterol, triglycerides, total phospholipids, HDL–phospholipids, LDL–phospholipids and in whole serum

Parameter	Control females CF	Psoriatic females PF
total cholesterol	181.94 + 11.71	176.83 + 15.13
HDL–cholesterol	51.32 + 8.94	46.03 + 6.18
	$p < 0.01$*	
LDL–cholesterol	114.16 + 12.89	113.03 + 14.96
triglycerides	95.32 + 29.26	112.79 + 31.9
total phospholipids	182.18 + 14.73	177.65 + 23.57
HDL–phospholipids	86.29 + 13.69	79.01 + 8.23
	$p < 0.05$*	
LDL–phospholipids	79.68 + 14.37	84.27 + 13.21

DISCUSSION

Previous findings and the hypothesis indicate that there is a relationship between altered lipid and lipoprotein metabolism which may be associated with the development of atherosclerosis or occlusive vascular disease in patients with psoriasis (8, 5, 17, 10).

Lindegard (7) has found 372 psoriasis cases out of 159, 200 examined subjects in the Swedish population of Gothenburg. Psoriasis in males only seems to be associated with iritis and ankylosing spondylitis, whereas psoriasis in females only is associated with lung cancer, diabetes, obesity, myocardial infection and asthma. Diabetes, alcoholism, hypertension, pneumonia and liver cirrhosis showed a significant cumulative association with psoriasis. Authors report that an increase in the arterial hypertension tendency in psoriatic patients may result from the prior use of corticoids in the treatment of psoriasis. It may indirectly lead to a conclusion that in women with psoriasis with a higher ratio of suffering from diabetes, obesity and myocardial infarction, disturbances of lipid profile existed as well.

The differentiation of the data in the literature may also be the result of including in a statistical analysis patients with various phases and forms of psoriasis, treated differently when the loss of lipids with scales from the skin surface may differ and, besides, may influence the blood serum lipids (13).

Another frequent mistake made in a lipid analysis is disregarding the differences in lipid referential values, like sex and age, which considerably change the obtained results when analysing young and old patients jointly. It seems that the studies conducted in a sex– and age–matched group with similar BMI would be the most appropriate.

Another source of discrepancy in results may be different methods used in laboratories and the fact that some of them carry out the analysis of elementary lipid profile in frozen blood (13). Peserico et al. (11) analysed 2 groups of women suffering from psoriasis, younger (aged 20–44 (47 women)) and older (over 45 years of age (44 women)). They claim a statistical decrease in total cholesterol in both group of females and an increase in TG in both groups as well. In the successive investigations by the same author (12) the studies were conducted on 96 women aged 20–59 years; mean 43 years, and compared to a control group of 451 women. The investigated patients were additionally divided into 2 groups – obese and non–obese. They observed a statistical increase in triglycerides in psoriatic females, also statistically higher triglicerides in obese females, lower total cholesterol in females.

Çimşit et al. (5) probably also analysed a sex– and age–mixed group. Even though the publication comes from the British Journal of Dermatology, the authors gave neither the age nor the sex of the examined people, PASI was 16. 5 ± 4.4.

Probably the group of patients with psoriasis consisted both of men and women because it is mentioned that a control group was sex– and age–matched. Their group consisted of patients who went through active and inactive phases of the disease. They observed significantly different values from control subjects.

Örem et al. (10) have investigated the lipid profiles in a mixed group consisting of 23 male and 10 female (range of age 15–58; mean 29 years) compared to the control group consisting of 30 age– and sex–matched healthy volunteers. Mean PASI score was 14.8. The authors observed a tendency to atherosclerotic events in serum total cholesterol, triacylglicerol and HDL–C levels, but not in levels of LDL–C. They found that autoantibodies against oxidized LDL were significantly increased compared to the control group. The group of our patients has been considerably younger than those analysed by the above mentioned authors, the range of age is 15–44 for the females, mean 23.33 ± ± 9.80 years. The age in the male group partly overlap with the patients studied by Örem et al. (10), although they analysed both males and females. Despite the younger age in our group, the lipid profile disturbances are clearly seen. We have not come across the results of lipid analyses in exclusively female groups. We also tried to match control groups regarding BMI which was also the aim of Peserico et al. and of Örem et al. (10, 11, 12). Naturally, lipid profile analyses in psoriatics should be conducted on a large number of patients with particular regard to BMI, sex, age, diet, alcohol consumption and to a proper choice of a control group.

Another source of such a big discrepancy in results may be the differentiation of the pathological process in the analysed patients determined by means of PASI score and the percentage of the skin area affected by a pathological process. Peserico et al. (11, 12) do not provide the characteristics of the severity of psoriasis. In our group the range of PASI score was 17.8–48.0, mean 27.6 ± 7.05.

The results of our study are similar to those of Peserico et al. (11, 12). Similarly to the results reported by Çimşit et al. (5) we have observed a statistically relevant decrease in HDL cholesterol concentration. In contrast to their results we have not observed an increase in total cholesterol concentration. However, it is not known how severe the pathological process was in a group of Turkish patients.

CONCLUSIONS

Significant decrease in the concentration of HDL cholesterol and phospholipids were stated.

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STRESZCZENIE

Stwierdzono istnienie zaburzeń przemiany lipidowej u kobiet z łuszczycą. Najbardziej nasilone dotyczyły obniżenia stężenia zarówno cholesterolu, jak i fosfolipidów HDL. Obserwowano również nieistotny wzrost stężenia trójglicerydów całkowitych i fosfolipidów związanych z frakcją LDL, obniżenie stężenia cholesterolu i fosfolipidów całkowitych.