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Prevalence and reasons for non-adherence to hyperlipidemia treatment

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Abstract: Aim: To assess the prevalence of medication non-adherence, and to assess the effect of selected patient-, doctor-, and therapy-related factors on patient adherence to hyperlipidemia treatment. Methods: Open-label questionnaire study in the primary care patients diagnosed with hyperlipidemia. Results: A total of 255 outpatients aged 60.2 +/- 10.3 (mean +/- SD) were enrolled. Only 61.6% of patients claimed to be fully adherent during the last week. The major source of motivation to take medication was expectation to lower cholesterol level, and only extremely infrequently (2.7%) - to prolong life. Patients often pointed at economic constrains as a reason for low adherence. Getting information from doctor about the purpose of therapy (OR=3.04, 95%CI 1.36-6.80, P<0.01), understanding the purpose of therapy (OR=5.09, 95%CI 1.30-19,90, P<0.05), reading the patient information leaflet (OR=3.37, 95%CI 1.78-6.36, P<0.001), positive opinion about the effectiveness of the treatment (OR=2.45, 95%CI 1.24-4.81, P<0.01), and visiting primary care once a month (OR=2.22, 95%CI 1.05-4.69, P<0.05) were associated with adherence to the treatment. Conclusions: Non-adherence to lipid-lowering medication is a frequent problem. This study suggests that effective doctor-patient communication may play an important role in rising patients' motivation to systematic treatment. Better adherence might be also obtained with prescribing more affordable drugs.

Keywords: Adherence to medication • Patient compliance • Hyperlipidemia • Doctor-patient communication

1. Introduction

Hyperlipidemia is one of the most important risk factors for atherosclerosis and cardiovascular disease. In Poland, it occurs among 67% of men and 64% of women [1]. As reported, the decline in mortality from coronary heart disease in Poland in 1991-2005 periods corresponded to the greatest extent to a decrease in the prevalence of risk factors. In as many as 39% of cases it was associated with a reduction in mean cholesterol level [2]. Successful treatment of hyperlipidemia is therefore of crucial importance in the primary and secondary cardiovascular prevention. The effectiveness of lipid-lowering therapy in Poland, however, remains far from desired. The WOBASZ study proved that only 10% of Polish hyperlipidemia patients were treated, while those treated effectively constituted only 3% of male patients, and 2% of female ones [1].

One of the important factors responsible for this problem is patient non-adherence to medication. This phenomenon occurs with various prevalence, and with varying degrees depending on many factors, including disease type, and type of prescribed medication. The World Health Organization estimates that it affects about 50% of patients treated for chronic diseases [3]. Among patients receiving lipid-lowering drugs, after 6 months only 36% satisfactorily adhered to treatment [4], and during the first year of treatment, a third of patients stopped the treatment completely [5]. Studies conducted in Poland confirm these trends: the analysis of pharmacy claims data showed that only 12% of patients took statins systematically, using at least 80% of prescribed doses [6].

The main consequence of medication non-adherence is ineffectiveness of the treatment, and thus, failure to achieve full benefits of evidence-based therapies. In the case of hyperlipidemia, a precondition for patients to achieve benefit from treatment is taking at

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least 80-90% of prescribed doses of medication. Taking a lower percentage of prescribed doses leads to significant reduction in the effectiveness of treatment, increased risk of cardiovascular incidents, and mortality [7-9]. As observed, patients non-adherent to the statin therapy had nearly 40% greater risk of cardiovascular incident during the 3-year follow-up period, compared with the adherent ones [10].

In order to improve patient adherence to medication, it is necessary to identify the factors that have a significant impact on this phenomenon. The aim of this study was therefore to assess the prevalence of medication non-adherence to hyperlipidemia treatment, as well as assess the effect of selected patient-, doctor-, and therapy-related factors on the level of patient adherence in this condition. It was also decided to assess how well selected information on lipid-lowering treatment motivates patients to take their drugs systematically. As face-to-face patient counselling sessions have been recently found to improve adherence with statins [11], such information may be used to design effective interventions.

2. Methods

The study was an open-label survey conducted in the primary healthcare conditions in the area of Lodzkie voivodship. The sample size of 200 subjects was calculated.

Outpatients diagnosed with hyperlipidemia who were prescribed lipid-lowering drugs were invited to the study. Those who agreed to participate received an anonymous self-administered questionnaire. The questionnaire was developed especially for this study on the basis of literature review, and the author's own experience. It consisted of three parts: the first one contained five questions on demographic characteristics, and the second - questions on the treatment with lipid-lowering drugs, and the extent and reasons for non-adherence to the treatment. The third part of the questionnaire contained 26 statements which the patients were to assess in terms of how much they convinced them to systematic use of lipid-lowering drugs.

As a result of the pilot study, conducted among 10 volunteers, minor changes were made in the structure of the questions in the second part of the questionnaire – it was eventually decided to contain 38 questions (including 17 open and 21 closed), and the number of statements provided for assessment in part three was limited to 17.

Adherence is a complex behaviour, and only recently, a new taxonomy and terminology has been agreed in this field [12]. However, due to the limitations arising from the methodology adopted for this study, not all aspects of adherence were covered by the study questionnaire, e.g. frequently used criterion of percentage of days covered (PDC) >80% of study period for categorization of adherent patients was not applicable due to the recall bias. Therefore, in order to cover major 'milestones' of adherence to medication process, i.e. initiation of treatment, its continuation and persistence, relevant questions were designed for study questionnaire. For this study, the primary outcome measure, named 'full adherence', was operationalized with common occurrence of three criterions: 1. Starting lipid lowering treatment 2. Continuation after using 1st pack of lipid lowering drug 3. Taking the medicine every day within a week prior to the survey.

2.1 Statistical methods

In the statistical analysis descriptive statistics were used and the qualitative variables were presented as mean +/- SD. Either parametric or non-parametric inference tests were applied to assess differences, depending on the distributions of variables. For the analysis of qualitative variables statistical methods based on the chi^2 test were applied. The significance level of $P<0.05$ was adopted. The effect of selected variables on adherence was tested with univariable logistic regression.

3. Results

RA total of 255 outpatients aged 60.2 +/- 10.3 (mean +/- SD) were enrolled in this study. A baseline cholesterol level for studied patients was 273.8 +/- 50.5 mg%. The characteristics of the studied population are given in Table 1. The most common class of lipid-lowering drugs among the studied patients were statins (53.0% of respondents), and the most commonly used medicine was simvastatin (31.4%). Nearly 70% of patients taking lipid-lowering drug committed taking it in the evening or at night (particularly between 17:00 - 21:00 hours - 51.4%). Nine percent of respondents experienced side effects while taking lipid-lowering drugs – these were primarily adverse effects from the gastrointestinal tract (4.8%), and headache (1.3%). One person felt a "muscle tremor", none of the respondents mentioned muscle pain.

3.1 Treatment execution

Responding to the question on overall assessment of the treatment, 25.1% of respondents admitted that "*they usually missed several doses of cholesterol-lowering drug.*" As the most common reason respondents gave forgetfulness (46 subjects), and much less frequently - adverse effects (4 subjects), and objective problems

Table 1. Respondents' characteristics.

Parameter	N	%
Population (n)	255	100
Gender		
Female	152	59.6
Male	103	40.4
Age (years)		
Mean +/- SD	60.2 +/- 10.3	X
range	26-91	X
Place of residence		
city > 500.000 population	220	86.3
city < 500.000 population	21	8.2
rural area	14	5.5
Education*		
primary	59	23.1
secondary	141	55.3
higher	52	20.4
Occupational status*		
employed	86	33.7
unemployed	10	3.9
pensioner	25	9.8
retired	131	51.4
History of coronary artery disease and/or heart attack	109	42.7
	146	57.3
Frequency of visiting a primary care doctor*		
once a week or more often	4	1.6
once in two weeks	11	4.3
once a month	87	34.1
once in two months	84	32.9
once in six months	54	21.2
once a year or less often	13	5.1
Lipid-lowering drug used		
Omega-3, Omega-6 acids	2	0.8
Fenofibrate	28	11.0
Atorvastatin	51	20.0
Lovastatin	2	0.8
Simvastatin	80	31.4
Fenofibrate + Atorvastatin	2	0.8
None	2	0.8
Does not remember / Lack of data	88	34.5
Time of day when the patient used lipid-lowering drug: OD:		
morning	14	5.5
7: 00-14:00	16	6.3
17: 00-21:00	131	51.4
21: 30-23:00	16	6.3
evening / night	31	12.2
BD	4	1.6
Other	5	2.0
Lack of data	38	14.9

the percentages do not sum up to 100% - missing data were not shown; SD – standard deviation, OD - once daily, BD - twice daily.

resulting from temporary staying away from the place of living (3 people).

Figure 1 illustrates in detail admitted realisation of treatment by patients. Over 10% of patients did not start the recommended lipid-lowering treatment at all. A similar proportion (7.5%) discontinued therapy after using the first packaging of the drug, most often justifying this
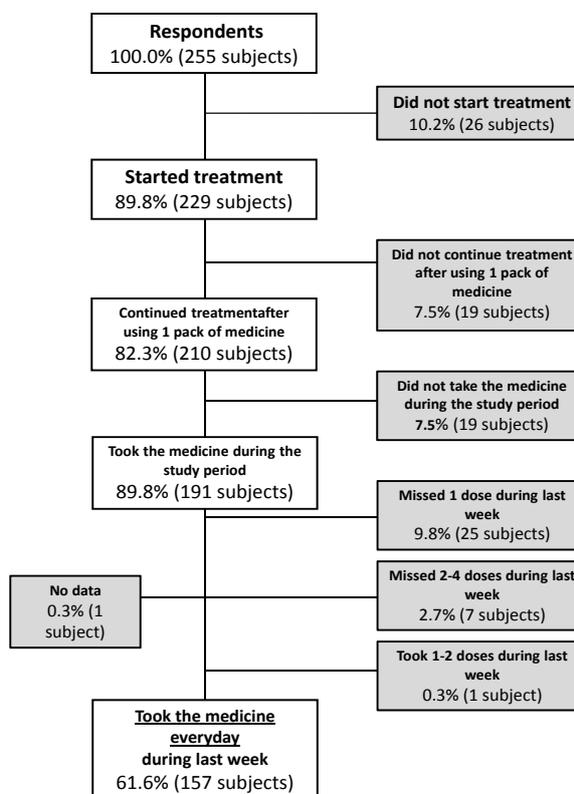

Figure 1. Admitted adherence to lipid-lowering treatment in studied subjects.

Table 2. Activities adopted by patients in order to remind them about taking medication in the evening[#$].

Activity	N	%
Uses a written drug dosing schedule	30	34.9
Prepares his/her drugs earlier (together with other drugs)	12	14.0
Uses a pill organiser	8	9.3
Sets an alarm in a cell phone	5	5.8
A family member reminds him/her	5	5.8
Puts drugs in a visible place	5	5.8
Takes lipid-lowering drug together with other ones	2	2.3
Writes down a note for himself/herself	2	2.3
Writes down dosage regimen on a drug packaging	2	2.3
Takes the drug during/after evening meal	2	2.3
Other	10	11.6
Not provided	5	5.8

[#] refers to people who declared taking any activity in order to remember about taking drugs in the evening, N = 86,
[$] respondents had a could give more than one answer.

by economic reasons (6 out of 19 people). Patients who discontinued treatment at a later stage usually justified it with the doctor's decision, financial problems, or adverse effects. Finally, less than 2/3 of respondents (61.6% of respondents) fully adhered to the treatment, taking the lipid-lowering drug every day during entire week prior to the survey.

Just over a third of respondents (33.7%) admitted that "*if the drug is to be taken in the evening, they do something in order to remember about this*." Activities adopted by the patients in order to do that are listed in Table 2, the most common of which was the use of a written schedule of medicines, as well as preparation of the drugs doses in advance - usually in the morning hours.

3.2 Motivation to treatment

The vast majority of respondents declared taking care of high cholesterol levels: 41.6% recognized this as a very serious condition, and 46.3% - as a serious one.

As a reason that convinced them to start lipid-lowering treatment, patients who started this treatment gave first of all high cholesterol (31.9%) (Table 3). The respondents' expectations related to the lipid-lowering treatment were similar: they primarily referred to normalizing cholesterol level, avoiding the consequences of atherosclerosis and improving one's health. It is noteworthy that only 2.7% of the respondents mentioned longer life as the expected effect of lipid-lowering treatment.

Table 3. Reasons to take up lipid-lowering treatment by the patient and expectations towards this treatment.

Factors convincing the patient to start lipid-lowering treatment*#	%
High cholesterol level	31.9
Desire to be healthy, to avoid diseases	28.8
Poor health, presence of diseases	14.8
Doctor	12.7
Presence of disease symptoms	5.7
Other	1.7
Not provided	4.4
Primary expectation from lipid-lowering treatment*$	%
Lowering/normalization of cholesterol level	58.8
Avoiding atherosclerosis consequences	36.1
Health condition improvement	27.5
Feeling better	12.9
Longer life	2.7
Other	3.1

open question, # refers to people who declared starting lipid-lowering treatment, N = 229, $ respondents had possibility to give more than one answer – the percentages do not sum up to 100%.

The baseline cholesterol levels for patients who started this treatment and those who did not start it were similar (respectively, 274.5 +/- 51.3 mg% and 264.2 +/- 27.6 mg%, P> 0.05.)

The question of whether the evening hours, being advisable in the case of some lipid-lowering drugs, is a convenient time to take medication was answered positively by 79.2% of respondents. Only 16.5% of the

respondents felt that it was an inconvenient time, and among the most common explanations there were arguments that "in the evening it's easier to forget about the dose of the medicine and skip it" (10 subjects), and that "the morning is better for remembering" (4 subjects).

The respondents were also asked why some people discontinue treatment with lipid-lowering drugs. Responses to this question are provided in Table 4, the most common were: financial reasons, and lack of knowledge about the disease and its consequences. It is noteworthy that only 3.5% of the respondents indicated the side effects of drugs as the cause of discontinuation of treatment.

Table 4. Reasons for which, according to the respondents, some people discontinue their lipid-lowering treatment$.

Reason	N	%
Economic constraints	78	30.6
Lack of knowledge about the disease and its consequences, unawareness of the consequences of high cholesterol level	44	17.3
Not caring about / underestimating importance of treatment, neglecting risk, not caring about their health	38	14.9
Forgetfulness	27	10.6
Lack of regularity, patience; laziness, carelessness	22	8.6
Lack of visible and tangible effects of treatment	17	6.7
Lack of desire for further treatment	15	5.9
Feeling cured out of hyperlipidemia with lowered cholesterol level and/or feeling better	10	3.9
Adverse effects – present, or expected	9	3.5
Lack of time, being busy	8	3.1
Lack of belief in therapy effectiveness	7	2.7
Too long therapy, being terrified with the perspective of taking the medication for the lifetime	6	2.4
Lack of motivation for treatment ("high cholesterol does not hurt")	4	1.6
Taking many different drugs at the same time	2	0.8
Other	10	3.9
Does not know	32	12.5
Not provided	39	15.3

$ respondents could give more than one answer – percentages do not total 100%; N=255.

Answers to the question of what assistance the respondents would expect from their doctor to consistently implement the prescribed therapy with lipid-lowering medicines were listed in Table 5. Frequent monitoring of cholesterol level was given most often (36.1% of responses).

Finally, respondents were presented 17 statements in order to find out which of them could convince them to use the lipid-lowering drugs systematically. At least 75% of respondents found 9 out of these statements "fairly convincing" or "very convincing". The most convincing statement was assessed "fairly convincing" or "very convincing" by as many as 81.2% of the respondents.

Table 5. Type of assistance that the respondents would expect from their doctor in order to help them adhere to their lipid-lowering medication.

Type of assistance	N	%
Frequent assessment of cholesterol level	92	36.1
Providing comprehensive information about prescribed drug and/or disease	15	5.9
Receives proper assistance, and does not expect an additional one	14	5.5
Selecting good medicines	13	5.1
Health check-ups	7	2.7
Effective therapy	6	2.4
Motivation	5	2.0
Less expensive medicines	4	1.6
Treatment continuation	2	0.8
Immediate assistance	2	0.8
Informing about proper diet	2	0.8
Other	12	4.7
Difficult to say	6	2.4
Not provided	75	29.4
TOGETHER	255	100.0

Table 6. Opinions on how long the lipid-lowering treatment should be continued.

Answer	N	%
For lifetime	68	26.7
To be decided by the doctor	42	16.5
Until the cholesterol level is lowered	25	9.8
Until an effect is achieved	20	7.8
Long	8	3.1
Until improvement of health condition	1	0.4
3 months	1	0.4
6 months	7	2.7
9 months	1	0.4
12 months	6	2.4
2 years	1	0.4
Several years	1	0.4
Other	1	0.4
Does not know	36	14.1
Not provided	37	14.5
Together	255	100.0

3.3 Understanding the aims of treatment

Not all of the respondents declared their full knowledge and understanding of the purpose of treatment with lipid-lowering drugs: 87.5% reported that the doctor told them what the aim of therapy was, 83.5% understood the purpose of therapy with the lipid-lowering medicine, but only 75.7% claimed that the doctor told them how long the treatment should last. More than ¾ of respondents (76.9%) read the informational leaflet included in the package of the drug prescribed. As many as 22.0% of the respondents found information there worrying, in particular: the information regarding possibility of muscle problems (10 subjects), liver damage (5 subjects), headache (2 subjects), and other adverse effects (23 subjects).

Table 6 contains the respondents' answers to the question of how long one should continue taking lipid-lowering medication. It is noteworthy that only one in four respondents (26.7%) indicated that the treatment should last "for lifetime", and nearly 25% of the respondents were convinced that the length of the treatment was indefinite (i.e., should be continued "until reduction of cholesterol", "*until the effect is achieved*", "*until the improvement of health*" or just for 3 months – up to several years; 24.7% of respondents in total). The respondents were also asked what the desired level of cholesterol was: for 58.0% of them it was in the range of 150-200 mg%, for 20.8% of respondents: up to 150 mg%, while for 3.5% of the respondents the target

range was 200-250 mg%. The remaining respondents did not know the answer to this question, or did not give it (4.7% and 12.9%, respectively).

3.4 The effect of selected variables on adherence

The results of logistic regression analysis of the effect of selected variables on adherence are provided in Table 7. With exception of occupational status, none of the demographic parameters was a predictor of adherence. Analysis indicated that getting information from the doctor about the purpose of therapy (OR=3.04, 95%CI 1.36-6.80, P<0.01), understanding the purpose of therapy (OR=5.09, 95%CI 1.30-19,90, P<0.05), reading the informational leaflet (OR=3.37, 95%CI 1.78-6.36, P<0.001), positive respondents' opinion about the effectiveness of lipid-lowering treatment (OR=2.45, 95%CI 1.24-4.81, P<0.01), and visiting a primary care doctor once a month (versus less frequent visiting, OR=2.22, 95%CI 1.05-4.69, P<0.05) were associated with self-reported adherence to lipid-lowering treatment.

4. Discussion

Non-adherence is one of the main barriers to the development of modern medicine. It is responsible for the discrepancy of therapy effectiveness, observed in practice, and the results achieved under carefully controlled

Table 7. Logistic regression results for adherence to lipid lowering treatment as a dependent variable.

Variable		OR	95%CI	P
Gender	female	1.09	0.61-1.95	P>0.05
	male	1.00		
Age	(per year)	1.02	0.99-1.05	P>0.05
Place of residence	city > 500.000 population	1.75	0.56-5.48	P>0.05
	city < 500.000 population	2.36	0.50-11.1	P>0.05
	rural area	1.00		
Education	primary	1.44	0.60-3.50	P>0.05
	secondary	1.16	0.56-2.40	P>0.05
	higher	1.00		
Occupational status	employed	2.92	1.13-7.56	P<0.05
	unemployed	1.83	0.38-8.84	P>0.05
	retired	2.89	1.18-7.09	P<0.05
	pensioner	1.00		
Opinion about the seriousness of elevated cholesterol level	very serious	2.02	0.82-4.98	P>0.05
	quiet serious	1.40	0.59-3.34	P>0.05
	not serious, or not serious at all	1.00		
History of coronary artery disease and/or heart attack	positive	1.64	0.90-2.98	P>0.05
	negative	1.00		
Getting information from the doctor about the purpose of therapy	yes	3.04	1.36-6.80	P<0.01
	no	1.00		
Understanding the purpose of therapy	yes	5.09	1.30-19.9	P<0.05
	difficult to say	1.52	0.34-6.81	P>0.05
	no	1.00		
Getting information from the doctor about the desired duration of therapy	yes	1.66	0.86-3.20	P>0.05
	no	1.00		
Reading the informational leaflet	yes	3.37	1.78-6.36	P<0.001
	no	1.00		
Adverse effects	absent	2.22	0.87-5.54	P>0.05
	present	1.00		
Respondents' opinion about the effectiveness of lipid-lowering treatment	effective	2.45	1.24-4.81	P<0.01
	ineffective	0.57	0.15-2.18	P>0.05
	difficult to say	1.00		
Respondents' opinion on convenience of taking lipid-lowering drugs in the evening	convenient	2.02	0.97-4.21	P>0.05
	inconvenient	1.00		
Taking any action to facilitate taking lipid-lowering drug in the evening	yes	1.70	0.86-3.37	P>0.05
	no	1.00		
Frequency of visiting a primary care doctor	once in two weeks or more often	1.00	0.30-3.30	P>0.05
	once a month	2.22	1.05-4.69	P<0.05
	once in two months	1.86	0.89-3.88	P>0.05
	once in six months or less often	1.00		

OR – odds ratio, 95%CI – 95% confidence interval

conditions of randomised clinical trials. Patients' nonadherent to medication does not achieve the achievable benefits of treatment. Moreover, they are responsible for an increased use of medical services, and are the source of additional costs [13]. These costs were assessed in Germany to be at least 10 billion Euro per year [14]. According to the author's calculations, the non-adherence-related costs incurred from the health care system budget in Poland may be estimated at 6 billion zloty (app. 1.5 billion Euro) per year.

Non-adherence is especially common in the case of chronic conditions of asymptomatic nature, where the treatment does not bring immediate, noticeable effects for the patient [15]. The most common disease of this type is hyperlipidemia, which, because of its serious consequences, has great social importance. The level of adherence identified in this study - only about 60% of respondents who admitted that they adhered to the lipid-lowering medication during the week prior to the survey - confirms this rule.

Ensuring proper adherence in case of hyperlipidemia is particularly important, as this is a precondition for ef-

fective primary and secondary prevention of cardiovascular events [16]. This study was an attempt to answer the questions about the causes of non-adherence to prescribed medication during the treatment of this disease, and about effective methods of its prevention and improvement. It is particularly important considering that many studies have demonstrated 30-50% reduction of mortality rate among patients taking lipid-lowering drugs regularly, compared with those not adherent to the treatment [14,17].

It was first of all high cholesterol level that motivated the respondents to take up the lipid-lowering treatment. Their expectations of the treatment included reduction in its level, while the expectations relating to the doctor's help included frequent controls of cholesterol levels. The expected elongation of life was not the argument motivating respondents to accept the treatment - only every 40th respondent reported such a source of motivation. The most frequently reported measure of the effectiveness of the therapy was lowering of cholesterol level, whereas lack of such effect was assumed the proof of therapy ineffectiveness. A large part of the respondents was not informed by their GPs how long the lipid-lowering drug should be taken that is why perhaps only every 4th patient believed that such treatment should be continued till the end of life.

Contrary to expectations, patients did not indicate the evening time of taking a lipid-lowering drug as a real barrier to the implementation of such a treatment. It is known though from other studies that taking medication in the evening hours poses more challenges for adherence than the use of the same medication in the morning [18].

Importantly, adverse effects were not often experienced by the respondents – they were reported by only 9.0% of them, and yet less frequently they were indicated by the respondents as a reason why people discontinue lipid-lowering therapy. In contrast, patients discontinuing treatment most often pointed to financial constraints. The same reason was indicated by the respondents in the first place among the reasons why people stop lipid-lowering treatment. Finally, the only demographic parameter of proven effect on adherence in this study was stable source of income, with those employed, or retired, having higher odds of adhering. All these indicate generally very good tolerance of lipid-lowering drugs, and a potential impact of the use of affordable drugs on adherence. Several studies have shown that the increased affordability of medicines improves adherence to treatment [14]. It should be emphasised that at present all the major lipid-lowering drugs have their generic versions available on the Polish market, which allows doctors to offer their patients effective treatment at affordable price.

It is also noteworthy that among the predictors of treatment continuation, there was none of the demographic ones (with exception of occupational status), as opposed to the parameters related to doctor-patient communication (giving information to the patient by the doctor about what the purpose of treatment was), and understanding the purpose of therapy (understanding the purpose of therapy with cholesterol-lowering medicines, opinion on the effectiveness of this treatment, reading the leaflet included inside the packaging). In another study, conducted in Poland, based on the analysis of pharmacy claims data for statins, it was proven that the percentage of patients continuing treatment increased with age – with the best rate of continuation in the group aged 75 and over. This effect had no practical impact though, because even in this group adherence to therapy was far from acceptable [6].

There are numerous interventions able to improve adherence. Particularly good results give those which provide patients with information regarding the drug taking, obtained through objective assessment of adherence [19]. One can hope that the implementation of an electronic patient's record, and electronic prescriptions in Poland, which is to happen within upcoming years, will enable doctors, pharmacists and patients closer insight into details of individual patient's pattern of medication taking. Thus, it might be a good starting point for implementation of such interventions in daily practice. There is evidence that apart from the obvious health benefits, improving adherence to the hyperlipidemia treatment leads to serious reduction of medical utilization, and healthcare systems costs [10,20,21].

Interpreting the results of this study one has to be aware of its limitations. These include single-centre nature of the study, and a limited number of enrolled subjects. The study also did not take into account whether patients received lipid-lowering drugs for primary or secondary prevention, and the available data suggest that discontinuation of therapy occurs slightly more often in primary prevention that in the secondary one [5,22]. These limitations do not reduce, however, the weight, nor the practical utility of the observed results. Identified sources of patients motivation to take their lipid-lowering treatment, may allow developing better interventions to improve adherence. This in turn may allow to increase the effectiveness of hyperlipidemia treatment, and to prevent complications more effectively, and indirectly to improve the public health, reduce cardiovascular mortality, and to reduce medical costs. These results may also help development of interventions to improve adherence to treatment of other chronic conditions, especially diseases of low-symptomatic or asymptomatic nature, such as hypertension or diabetes type 2.

5. Conclusions

1. A large portion of patients (nearly 40%) did not adhere to their treatment of hyperlipidemia.

2. The main motivation of patients to use lipid-lowering drugs was their desire to reduce cholesterol levels, and their expectations were related to frequent testing of its level.

3. Lack of effective communication between doctors and patients was the major reason for failure to adhere. In particular, a substantial portion of patients did not know the desired period of treatment with lipid-lowering drugs.

4. Respondents declared economic constraints as a frequent cause of non-adherence in case of the treatment of hyperlipidemia. This points to a potential role prescribing of more affordable medicines in improving adherence.

Acknowledgments

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