Int J Clin Exp Med 2021;14(2):1283-1291
www.ijcem.com /ISSN:1940-5901/IJCEM0123169

Original Article

Effects of community intervention and management on preventing and treating cardiovascular diseases among patients with dyslipidemia

Yuan He[1], Jianhua Shen[2], Xiaoting He[3], Xiaoying Dong[1]

Departments of [1]Cardiology, [2]Public Health Management, [3]Prevention and Health Care, The Fourth People's Hospital of Wujiang District, Suzhou, Jiangsu Province, China

Received September 26, 2020; Accepted October 21, 2020; Epub February 15, 2021; Published February 28, 2021

Abstract: Objective: This paper aimed to evaluate the effects of comprehensive intervention and graded management for the prevention and treatment of cardiovascular diseases among patients with dyslipidemia in the Wujiang District of China. Methods: A database for patients' blood lipids was created and stratified random sampling was conducted. A total of, 1,105 patients who agreed to accept treatment intervention and management were grouped as the intervention group, while 1090 patients who disagreed with intervention were grouped as the control group. Those in the control group did not receive active follow-up or intervention, while those in the intervention group received comprehensive intervention and management in the community. After 18-months of follow-up, the health indices were compared between the two groups before and after management in terms of awareness rates, treatment rates, compliance rates, the levels of blood lipids, the scores of the Dietary Evaluation Scale for Patients with Hyperlipidemia (DESPH), and the onset risks of arteriosclerotic cardiovascular disease (ASCVD) within 10 years. The incidence of cardiovascular endpoint events was also compared. Results: After management, the three rates in the intervention group were remarkably higher than those before management, and they were remarkably higher than those in the control group (all P<0.001). After management, the DESPH scores in the intervention group were remarkably lower than those before management, and they were remarkably lower than those in the control group (all P<0.001). After management, the levels of TG, TC and LDL-C reduced remarkably, while HDL-C levels increased remarkably in the intervention group, and the differences were statistically significant compared with those in the control group (all P<0.01). After management, the proportion of high-risk and extremely high-risk patients with dyslipidemia reduced remarkably, while that of low-risk and intermediate-risk patients increased remarkably in the intervention group (all P<0.001). According to the 18-month follow-up, the incidence of cardiovascular endpoint events in the intervention group was remarkably lower than that in the control group (P<0.001). Conclusion: For patients with dyslipidemia, assistance of community intervention and graded management can contribute to health education, improve diets and nutrition, and effectively regulate abnormal levels of blood lipids, and is therefore particularly relevant for reducing the risk of cardiovascular disease in the patients.

Keywords: Dyslipidemia, community interventions, graded management, cardiovascular events

Introduction

According to epidemiological investigations, cardiovascular diseases (CVDs) are the leading cause of death among Chinese residents, and the mortality rates among urban and rural residents are 42.61% and 45.01%, respectively [1]. Atherosclerotic cardiovascular disease (ASCVD) is a main factor for the high mortality of CVDs in China, and dyslipidemia is considered as one of its main risk factors [2]. Many studies have confirmed that the decreasing levels of total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C) and triglycerides (TG) and the increasing levels of high-density lipoprotein cholesterol (HDL-C) can significantly reduce the incidence and death risk of ASCVD [3-5]. Comprehensive intervention and graded management can significantly improve the blood lipid levels of patients with dyslipidemia [6]. In China, the prevention and treatment work for CVDs has been carried out for many years, and certain results have been achieved. However, generally speaking, the prevalence and mortal-

ity rates of this disease is still on the rise. In 2016, a joint committee that was composed of multidisciplinary Chinese experts revised *The Guidelines For Prevention and Treatment Of Dyslipidemia in Chinese Adults*, streamlined the indicators for the risk assessment of CVDs, and optimized the predictive model for the onset risk of ASCVD within 10 years [7]. Currently, community intervention for patients with dyslipidemia has been widely reported, but there is no research on different graded management measures for different risks of ASCVD in patients. Therefore, this study was designed to implement intervention and management measures with different intensities according to the different risks, and to evaluate their effects on preventing and treating CVDs, further providing a theoretical basis for the establishment and improvement of the community intervention and management of disease care and prevention in China.

Materials and methods

Research subjects

A database for blood lipids in patients with dyslipidemia was used, which was created through the community doctors working platform of The Fourth People's Hospital of Wujiang District and the screening platform of cardiocerebrovascular diseases in Wujiang District. Through stratified random sampling, 1,200 patients that agreed with intervention and management from March to June, 2018 (the intervention group) were selected, while 1,110 patients that disagreed were grouped as the control group.

Inclusion criteria: Patients were aged 35-79 years; patients who met the diagnostic criteria of dyslipidemia from The Guidelines For Prevention and Treatment Of Dyslipidemia in Chinese Adults (Revised Edition 2016), which was formulated by the joint committee: (1) TC ≥5.18 mmol/L, (2) TG ≥1.7 mmol/L, (3) LDL-C ≥3.37 mmol/L, (4) HDL-C <1.04 mmol/L, and those who met any of the above criteria [7]; patients who were currently receiving treatment with lipid-lowering drugs such as statins. Exclusion criteria (in line with any of the following criteria): Those who had suffered from CVDs before enrollment; those with secondary hyperlipidemia that was caused by other reasons; those with hepatic and renal dysfunction; tumor patients; those with mental or cognitive disorders and those who were unable to communicate normally; pregnant or lactating women. All enrolled patients were followed up for 18 months (from June, 2018 to December, 2019). Among them, 115 were lost to follow-up, or withdrew from the study halfway, and had incomplete data. Finally, 1090 patients were actually included in the control group and 1105 patients in the intervention group.

Research methods

Creation of database: Before and after intervention, the data of body mass index (BMI), blood pressure, blood lipids, diabetes, smoking, family history and dietary patterns were collected from all enrolled patients via questionnaire surveys, dietary surveys, body measurement and laboratory testing. Regular follow-up records were made by community doctors that were uniformly trained. The personal health records of all patients were entered into the electronic management platform of the database of patients with dyslipidemia.

Plans for community intervention and management: Through consulting domestic and foreign literature, the patterns of community intervention and management for patients with dyslipidemia were compared among various studies. The plans for the implementation were formulated in combination with the advantages of basic management measures in this community. Firstly, based on the flow chart of ASCVD risk assessment, the assessment was conducted on the patients in the intervention group, in which low-risk and intermediate-risk patients were included in the first-grade management; high-risk patients were included in the second-grade management; extremely high-risk patients were included in the third-grade management [7]. A team of community doctors and nurses was set up, and subjected to unified and standardized training in the early stages, so as to manage drugs for dyslipidemia. Those in the intervention group received regular follow-ups according to the plans, whereas those in the control group did not receive active follow-ups or interventions.

Intervention methods: Patients in the control group were routinely treated with lipid-lowering drugs and given outpatient health education,

with appropriate statins selected for their basic treatment. Adverse drug reactions were monitored, and other lipid-lowering drugs were used when necessary.

Those in the intervention group received community interventions. (1) Health education and self-management: Relying on community follow-up management platforms (such as a dyslipidemia patients club, a WeChat official account, and morning classroom education at a lecture hall), the doctors and nurses transmitted the correct knowledge of health education for blood lipid management to the patients, strengthened their self-management abilities, and improved their awareness of dyslipidemia management. (2) Changes in lifestyles and their supervision by community health service nurses: 1) the patients were guided to adhere to a healthy and balanced diet, quit smoking, and drink less alcohol, which can be realized by controlling the intake of dietary fat and cholesterol. It was recommended for dietary cholesterol to be <300 mg/d and the water-soluble dietary fiber to be 10-25 g/d. Besides, the patients were instructed to eat more cholesterol-lowering foods (such as beans, bean products, agarics, mushrooms, oats, konjacs, kelp and marine fishe), which can increase the intake of dietary fiber and then prevent and treat hyperlipidemia. 2) Regular exercise and the control of ideal body weight: The patients were encouraged to exercise properly, to burn body fat, and accelerate blood circulation, which was helpful to prevent cholesterol from depositing on the blood vessel walls. They were also guided to choose sui table sports for exercise (such as Tai Ji Quan, jogging and fast walking) for 30-50 minutes every day. They were asked to control their body weight, keep their BMI at <24 kg/m^2, and reduce or avoid obesity. (3) Principles of treating dyslipidemia: Appropriate statins were chosen as the basic treatment for lowering blood lipids, and the patients' adverse drug reactions were monitored. The treatment goals of low-risk patients with cardiovascular events were LDL-C <4.14 mmol/L and TC <6.22 mmol/L; those of intermediate-risk patients were LDL-C <3.37 mmol/L and TC <5.18 mmol/L; those of high-risk patients were LDL-C <2.59 mmol/L and TC <4.14 mmol/L; those of extremely high-risk patients were LDL-C <2.07 mmol/L and TC <3.11 mmol/L. The above goals were generally achieved within 4 weeks of treatment. For patients with poor therapeutic effects or those whose goals were not achieved after 4 weeks, were given other lipid-lowering drugs for treatment. According to the classification of the different risk levels of cardiovascular events, if patients with different grades reached their prescribed goals for one month, community interventions were stopped.

Graded management: First-grade management focused on life intervention. Health education on community intervention for therapeutic lifestyles was carried out, and follow-ups were conducted once every 3 months. Physical examinations were regularly performed to re-check and record the patients' blood glucose, blood pressure, blood lipids and other indicators. The patients were followed up for their life style, dietary and exercise status, so as to provide targeted intervention opinions. If dyslipidemia was not relieved after 3 months, it was decided whether to use lipid-lowering drug or not after evaluation.

The grade-two management was based on life style intervention and supplemented by drug intervention. Community health education was carried out, and individualized intervention programs were developed for the patients. They were followed up once every 2 months, and physical examinations were regularly performed to re-check and record their blood glucose, blood pressure, blood lipids and other indicators. Their life, dietary and exercise status was followed up, and the individualized programs were adjusted in real time. If their blood lipids were not improved after one month, they would be treated with lipid-lowering drugs.

The grade-three management was based on drug intervention and supplemented by life intervention. Community health education was carried out, and individualized intervention programs were developed for the patients. They were followed up once every one month for their life style, dietary and exercise status, and the individualized programs were adjusted in real time. The changes in their blood glucose, blood pressure, blood lipids and other indicators were monitored, in order to adjust the treatment programs in time. If their blood lipids were not improved after 3 months, they would be transferred to higher-level hospitals for treatment by other specialists. The clinical complications of dyslipidemia were diagnosed and treated early.

Outcome measures

Main outcome measures: (1) After 18-months of follow-up, before and after management, the awareness, treatment and compliance rates of patients with dyslipidemia were calculated through questionnaires. The awareness rate = the number of patients who had been tested for blood lipids and had known about dyslipidemia/the number of the patients actually enrolled. The treatment rate = the number of patients receiving treatment/the number of the patients actually enrolled. The compliance rate = the number of patients with the qualified levels of blood lipids/the number of the patients actually enrolled.

(2) Before and after management, the levels of blood lipids (TG, TC, HDL-C, LDL-C) in the patients were compared between both groups.

Secondary outcome measures: (1) The Dietary Evaluation Scale for Patients with Hyperlipidemia (DESPH) was used to evaluate the patients' dietary patterns [8]. A score of <3 points indicates qualified; a score of 3-5 points indicates mildly poor diets; a score of >6 points indicates severely poor diets.

(2) According to the predictive model for the onset risk of ASCVD, the onset risk within 10 years was compared between the two groups before and after management [7].

(3) After the 18-month follow-up, the incidence of cardiovascular endpoint events was recorded and compared between both groups. The events included coronary heart diseases (myocardial infarction, percutaneous coronary intervention, stent thrombosis, and hospitalization caused by unstable angina pectoris), hospitalization caused by acute heart failure, cerebrovascular diseases (stroke, transient ischemic attack), peripheral vascular intervention and death [9].

Statistical methods

In this study, SPSS 21.0 was applied for statistical analysis. Measurement data were expressed as mean ± standard deviation ($\bar{x}$ ± sd). Their comparison between groups was conducted by an independent samples t test, while the comparison within groups before and after management was conducted by a paired t test. Categorical counting data were expressed as the number of cases (%), and their comparison within groups before and after management was conducted by a paired χ^2 test, with the comparison between two groups conducted by a χ^2 test. P<0.05 indicated statistical significance.

Results

General information of patients with dyslipidemia

In this study, 2,195 patients were enrolled, with 1,090 cases in the control group and 1,105 cases in the intervention group. See **Table 1** for specific general information.

Effects of health education

In the control group, the awareness, treatment and compliance rates were not statistically different between before and after management (P>0.05). After management, the three rates in the intervention group were remarkably higher than those before management, and they were remarkably higher than those in the control group (all P<0.001). See **Table 2**.

Dietary evaluation

In the control group, the DESPH scores were not significantly different between before and after management (P>0.05). After management, the scores in the intervention group were remarkably lower than those before management, and they were remarkably lower than those in the control group (all P<0.001). See **Table 3** and **Figure 1**.

Changes in blood lipid levels

In the control group, the levels of TG, TC, HDL-C and LDL-C were not significantly different between before and after management (P>0.05). After management, the levels of TG, TC and LDL-C were remarkably reduced, while HDL-C levels increased remarkably in the intervention group, and the differences were statistically significant compared with those in the control group (all P<0.01). See **Table 4**.

Effects on prevention and treatment of CVDs

In the control group, there was no significant change in the proportion of patients with different risk levels between before and after man-

Table 1. Comparison of general information of patients with dyslipidemia ($\bar{x} \pm sd$, n)

	Control group (n=1,090)	Intervention group (n=1,105)	χ^2/t	P
Age (year)	62.7±11.1	62.4±10.0	0.665	0.506
Gender (n)			0.971	0.324
Male	523	507		
Female	567	598		
Body mass index (kg/m^2)	23.86±2.91	23.80±2.88	0.485	0.627
Obesity (n)			43.995	<0.001
Yes	55	146		
No	1035	959		
Smoking (n)			30.574	<0.001
Yes	168	275		
No	922	830		
Hyperuricemia (n)			2.549	0.110
Yes	128	155		
No	962	950		
Non-alcoholic steatohepatitis (n)			28.801	<0.001
Yes	134	230		
No	956	875		
Fatty liver (n)			0.954	0.329
Yes	145	163		
No	945	942		
Hypertension (n)			9.765	0.002
Yes	683	620		
No	407	485		
Diabetes mellitus (n)			0.310	0.578
Yes	390	408		
No	700	697		
Occupation (n)			8.840	0.012
Farmer	460	398		
Retired worker	538	606		
Others	92	101		
Education background (n)			95.786	<0.001
Senior high school and below	783	606		
Bachelor	297	422		
Master and above	10	77		
Previous treatment history (n)			19.183	<0.001
Non-drug treatment	673	580		
Drug treatment	417	525		

agement (P>0.05). After management, the proportion of high-risk and extremely high-risk patients with dyslipidemia reduced remarkably, while that of low-risk and intermediate-risk patients increased remarkably in the intervention group (all P<0.001). See **Table 5**.

Analysis of cardiovascular endpoint events

According to the 18-month follow-ups, the incidence of cardiovascular endpoint events in the intervention group was remarkably lower than that in the control group (P<0.001). See **Table 6**.

Discussion

Atherosclerosis of the arterial walls and thrombosis, which are caused by the abnormal metabolism of blood lipids, are two major risk factors of CVDs [8]. According to a clinical randomized controlled trial, after correction by the

Table 2. Comparison of the awareness, treatment and compliance rates of patients with dyslipidemia (n, %)

	Control group (n=1,090)	Intervention group (n=1,105)	χ^2	P
Awareness rate				
Before management	177 (16.24)	199 (18.01)	1.212	0.271
After management	188 (17.25)	895 (81.00)	892.113	<0.001
χ^2	0.398	876.858		
P	0.528	<0.001		
Treatment rate				
Before management	152 (13.94)	166 (15.02)	0.514	0.473
After management	170 (15.60)	730 (66.06)	577.732	<0.001
χ^2	1.181	597.100		
P	0.277	<0.001		
Compliance rate				
Before management	130 (11.93)	144 (13.03)	0.613	0.434
After management	142 (13.03)	696 (62.99)	580.263	<0.001
χ^2	0.605	585.155		
P	0.437	<0.001		

Table 3. Comparison of dietary evaluation of patients with dyslipidemia ($\bar{x} \pm sd$)

	Control group (n=1,090)	Intervention group (n=1,105)	t	P
Before management	3.39±1.34	3.33±1.33	1.053	0.293
After management	3.30±1.45	2.75±1.43	8.947	<0.001
t	1.505	9.873		
P	0.132	<0.001		

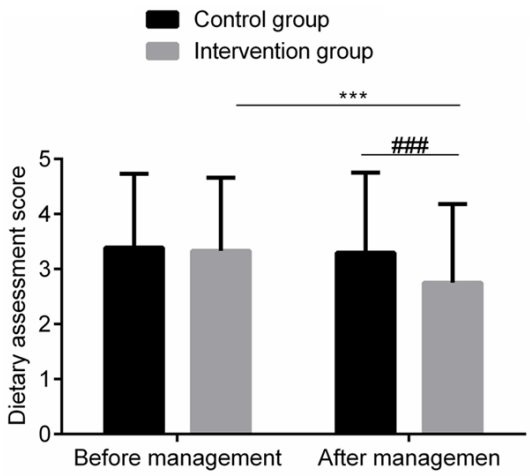

Figure 1. Comparison of dietary evaluation of patients with dyslipidemia. Compared with before management, ***P<0.001; compared with control group, ###P<0.001.

established risk factors (such as LDL-C) of coronary heart diseases, the rise of TG levels is significantly related to the increase of mortality rates, myocardial infarction rates and the recurrence rates of coronary events, so TG is considered as an independent risk factor of coronary artery diseases [9]. For patients with dyslipidemia, community intervention and effective management models are effective in managing blood lipids. Community intervention for dyslipidemia is a kind of health promotion activity that is based on the community and designed for different target groups; the key of the intervention based on the ability to enhance patients' daily practical skills, to help them "know" and pay attention to "do" [10].

This study evaluated the rationality and effectiveness of the community intervention and graded patterns in patients with dyslipidemia, and extended this strategy to 23 community health service stations in Zhenze Town, in order to lower the incidence and the mortality rate of cardiovascular events in the patients and to reduce medical and health costs. Lifestyle interventions are essential to people's long-time health, and unreasonable diets cause abnormal blood glucose and lipids, further leading to atherosclerosis [11, 12]. As reported by previous studies, dietary cholesterol is positively and significantly correlated with the mortality rate of ASCVD [13]. Carbohydrate filled food that is rich in fiber is the best dietary substitute for saturated fat, and maximizes the effects of diet on LDL-C levels [14]. In this study, after management, the awareness, treatment and compliance rates in the intervention group were remarkably higher than those before management; the DESPH scores in this group were remarkably lower than those before management, and the differences were statistically significant compared with those in the control group. This suggests that for patients with dyslipidemia, the assis-

Table 4. Comparison of the awareness, treatment and compliance rates of patients with dyslipidemia ($\bar{x} \pm sd$)

	Control group (n=1,090)	Intervention group (n=1,105)	t	P
TG (mmol/L)				
Before management	2.44±0.56	2.49±0.91	1.548	0.122
After management	2.39±0.72	2.25±0.61	4.918	<0.001
t	1.910	7.282		
P	0.070	<0.001		
TC (mmol/L)				
Before management	6.13±1.47	6.21±1.10	1.445	0.149
After management	6.04±1.20	5.91±0.97	2.793	0.005
t	1.566	6.800		
P	0.118	<0.001		
LDL-C (mmol/L)				
Before management	2.97±0.36	2.95±0.27	1.474	0.141
After management	2.95±0.34	2.74±0.25	16.501	<0.001
t	1.333	18.971		
P	0.183	<0.001		
HDL-C (mmol/L)				
Before management	1.18±0.23	1.19±0.25	0.975	0.330
After management	1.19±0.22	1.25±0.25	5.966	<0.001
t	1.037	5.641		
P	0.300	<0.001		

Note: TC: total cholesterol; LDL-C: low-density lipoprotein cholesterol; TG: triglycerides; HDL-C: high-density lipoprotein cholesterol.

Table 5. Comparison of ASCVD risk assessment of patients with dyslipidemia (n, %)

	Control group (n=1,090)	Intervention group (n=1,105)	χ^2	P
Before management			0.823	0.364
Low risk, medium risk	402 (36.88)	387 (35.02)		
High risk, very high risk	688 (63.12)	718 (64.98)		
After management			42.718	<0.001
Low risk, medium risk	440 (40.37)	600 (54.30)***		
High risk, very high risk	650 (59.63)	505 (45.70)***		

Note: compared within the same risk level before management, ***P<0.001. ASCVD: arteriosclerotic cardiovascular disease.

tance of community intervention and graded management can contribute to health education, and improve the rationality of diet and nutrition. This conclusion is similar to the findings of relevant research [15]. For every 1.0 mmol/L decrease in LDL-C levels, the incidence of CVDs correspondingly reduces by 22%, and that of heart disease and ischemic stroke also reduced [16]. For patients with dyslipidemia, the levels of blood lipids are also a main outcome measure to evaluate the therapeutic effects on them. In our study, after management, the levels of TG, TC and LDL-C were remarkably reduced, while HDL-C levels was increased remarkably in the intervention group, and the differences were statistically significant compared with those in the control group. This indicates that the pattern of community intervention and graded management can effectively regulate the patients' blood lipid levels, which is similar to the findings of Tan et al. [17]. This is because through community intervention, patients can better understand the importance of regulating blood lipids, enhance their treatment compliance, and strictly control their diets, as well as take part in reasonable exercise. All of these schemes can effectively lower blood lipids, which has been confirmed by evidence-based medicine [18].

Guidelines at home and abroad suggest that the risk assessment of CVDs should be carried out in the treatment of dyslipidemia. Although changes in therapeutic lifestyles can remarkably improve the levels of blood lipids, lipid-lowering drugs are essential to the treatment of high-risk and extremely high-risk patients. Many clinical studies have shown that statins can remarkably reduce the incidence and the mortality rate of CVDs, slow down coronary atherosclerosis, and even promote its regression [19, 20]. For people with a low total risk of CVDs, it is necessary to prescribe drugs carefully when conducting primary prevention [21]. Due to the full consid-

Table 6. Comparison of analysis of cardiovascular endpoint events of patients with dyslipidemia (n, %)

	Control group (n=1,090)	Intervention group (n=1,105)	χ^2	P
Coronary heart disease	64 (5.87)	42 (3.80)	5.119	0.024
Hospitalization due to an acute heart failure event	25 (2.29)	16 (1.45)	2.141	0.143
Cerebrovascular disease	33 (3.03)	19 (1.72)	4.059	0.044
Peripheral vascular intervention	8 (0.73)	5 (0.45)	0.738	0.390
Death	5 (0.46)	3 (0.27)	0.530	0.467
Total	135 (12.39)	85 (7.69)	13.401	<0.001

Note: Coronary heart disease includes coronary intervention, stent thrombosis, myocardial infarction, and hospitalization for unstable angina. Cerebrovascular diseases include stroke and transient ischemic attack.

eration of the cost-effectiveness and quality of life of the patients, graded management was applied to this study. After management, the proportion of high-risk and extremely high-risk patients with dyslipidemia reduced remarkably, while that of low-risk and intermediate-risk patients increased remarkably in the intervention group. Additionally, the incidence of cardiovascular events was remarkably lower in the intervention group. This suggested that for patients with dyslipidemia, the pattern of community intervention and graded management can significantly reduce the proportion of high-risk and extremely high-risk patients with cardiovascular events, and then lower the risk of the events. This is similar to the findings of Weng et al. [22]. The data in this study were from assingle-center and the duration of the follow-up was short, but the influence of dyslipidemia on the patients is usually longer than ten years. Therefore, it is still necessary to extend the duration of follow-ups, in order to more accurately evaluate the effects of this scheme on patients and on preventing CVDs.

In summary, for patients with dyslipidemia, the pattern of community intervention and graded management can contribute to health education, improvement of diet and nutrition, and effectively regulate abnormal levels of blood lipids, so it is particularly important for reducing the risk of cardiovascular events.

Disclosure of conflict of interest

None.

Address correspondence to: Xiaoying Dong, Department of Cardiology, The Fourth People's Hospital of Wujiang District, No. 1333 Zhennan 1st Road, Zhenze Town, Wujiang District, Suzhou 215231, Jiangsu Province, China. Tel: +86-13912701118; E-mail: dongxiaoying06wj@163.com

References

[1] Xu Y, Shen JY, Shi R and Xue JH. Assessment and analysis of the risk for ischemic cardiovascular disease among middle -aged population in communities. Chin Gen Prac 2015; 18: 2894-2897.

[2] Brown WV, Remaley AT and Ridker PM. JCL Roundtable: is inflammation a future target in preventing arteriosclerotic cardiovascular disease. J Clin Lipidol 2015; 9: 119-128.

[3] Katsuta H, Tsuboi K, Yamamoto H and Goto H. Correlations between serum cholesterol and vascular lesions in fabry disease patients. Circ J 2018; 82: 3058-3063.

[4] Brea A, Hernández-Mijares A, Millán J, Ascaso JF, Blasco M, Díaz A, Mantilla T, Pedro-Botet JC and Pintó X. Non-HDL cholesterol as a therapeutic goal. Clin Investig Arterioscler 2019; 31 Suppl 2: 28-33.

[5] Zhang L, He S, Li Z, Gan X, Li S, Cheng X, Yang N and Zheng F. Apolipoprotein E polymorphisms contribute to statin response in Chinese ASCVD patients with dyslipidemia. Lipids Health Dis 2019; 18: 129.

[6] Kim YH, Her AY, Jeong MH, Kim BK, Shin DH, Kim JS, Ko YG, Choi D, Hong MK and Jang Y. Two-year outcomes of statin therapy in patients with acute myocardial infarction with or without dyslipidemia after percutaneous coronary intervention in the era of new-generation drug-eluting stents within Korean population: data from the Korea acute myocardial infarction registry. Catheter Cardiovasc Interv 2019; 93: 1264-1275.

[7] Joint Committee on Revision of guidelines for prevention and treatment of dyslipidemia in Chinese adults. Guidelines for prevention and treatment of dyslipidemia in Chinese adults

(revised in 2016). Chin J Cardiol 2016; 44: 833-853.
[8] Lacy M, Atzler D, Liu R, de Winther M, Weber C and Lutgens E. Interactions between dyslipidemia and the immune system and their relevance as putative therapeutic targets in atherosclerosis. Pharmacol Ther 2019; 193: 50-62.
[9] Dron JS and Hegele RA. Genetics of triglycerides and the risk of atherosclerosis. Curr Atheroscler Rep 2017; 19: 31.
[10] Tu HL. Effects of community-based interventions in mixed hyperlipidemia. Chin Gen Prac 2020; 23: 1932-1935.
[11] Tuso P, Stoll SR and Li WW. A plant-based diet, atherogenesis, and coronary artery disease prevention. Perm J 2015; 19: 62-67.
[12] Perales-Torres AL, Castillo-Ruíz O, Castañeda Licón MT, Alemán-Castillo SE and Jiménez Andrade JM. Diabetes and type of diet as determinant factor in the progression of atherosclerosis. Arch Cardiol Mex 2016; 86: 326-334.
[13] Carr SS, Hooper AJ, Sullivan DR and Burnett JR. Non-HDL-cholesterol and apolipoprotein B compared with LDL-cholesterol in atherosclerotic cardiovascular disease risk assessment. Pathology 2019; 51: 148-154.
[14] Girona J, Amigó N, Ibarretxe D, Plana N, Rodríguez-Borjabad C, Heras M, Ferré R, Gil M, Correig X and Masana L. HDL triglycerides: a new marker of metabolic and cardiovascular risk. Int J Mol Sci 2019; 20: 3151.
[15] Wu Q and Du YP. Effect evaluation of community grading management of dyslipidemia in Hangzhou. Chin J Soc Med 2018; 35: 185-189.
[16] Navarese EP, Robinson JG, Kowalewski M, Andreotti F, Bliden K, Tantry U, Kubica J, Raggi P and Gurbel PA. Association between baseline ldl-c level and total and cardiovascular mortality after LDL-C lowering: a systematic review and meta-analysis. JAMA 2018; 319: 1566-1579.
[17] Tan SM, Han E, Quek RYC, Singh SR, Gea-Sánchez M and Legido-Quigley H. A systematic review of community nursing interventions focusing on improving outcomes for individuals exhibiting risk factors of cardiovascular disease. J Adv Nurs 2020; 76: 47-61.
[18] Newman TV, San-Juan-Rodriguez A, Parekh N, Swart ECS, Klein-Fedyshin M, Shrank WH and Hernandez I. Impact of community pharmacist-led interventions in chronic disease management on clinical, utilization, and economic outcomes: an umbrella review. Res Social Adm Pharm 2020; 16: 1155-1165.
[19] Diamond DM and Ravnskov U. How statistical deception created the appearance that statins are safe and effective in primary and secondary prevention of cardiovascular disease. Expert Rev Clin Pharmacol 2015; 8: 201-210.
[20] Adham S, Miranda S, Doucet J, Lévesque H and Benhamou Y. Statins in primary prevention of cardiovascular disease. Rev Med Interne 2018; 39: 42-49.
[21] Amariei DE and Reed RM. The role of statins in chronic obstructive pulmonary disease: is cardiovascular disease the common denominator? Curr Opin Pulm Med 2019; 25: 173-178.
[22] Weng GL, Xu YF and Lu JL. Evaluation of community elderly patients' carotid atherosclerosis comprehensive intervention effect. Xian Dai Yu Fang Yi Xue 2018; 45: 65-70.