Original Article

Knowledge and Performance of Iranian Internists Regarding Dyslipidemia According to Lipid Guidelines and their Relationships with Personal and Occupational Characteristics

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Received 25 February 2023; Accepted 01 October 2023

Abstract

Background: *Lipid metabolism disorders are among the most common metabolic diseases that are increasing globally and are associated with chronic metabolic disturbances. The present study aimed to determine the knowledge and practice of internal medicine physicians concerning lipid disorders according to the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines.*

Methods: *This descriptive-analytical cross-sectional study selected a convenience sample of 220 internal medicine specialists from January through September 2021 in Tehran and some other Iranian cities. A 25-item researcher-designed questionnaire was used. Suggested scenarios were designed by emphasizing the points of difference in the guidelines. Content validity was approved by 10 tenured faculty members, and reliability was tested with the test-retest method.*

Results: *Women comprised 60% of the population. In addition, 3.2% (n=7) of the physicians had poor knowledge, 95.0% (n=209) had moderate knowledge, and 1.8% (n=4) had good knowledge of lipid disorders based on international guidelines. Moreover, performance regarding lipid disorders was poor in 25 (11.4%), moderate in 164 (74.5%), and good in 31 (14.1%) physicians. The knowledge score decreased, whereas the practice score increased with age. The knowledge score of female physicians was significantly higher than that of their male counterparts. The knowledge score was negatively correlated with the physician's years of experience.*

Conclusion: *The knowledge and performance of internists regarding dyslipidemia were rated moderate according to the AHA, AACE, ESC-EAS and NCEP-ATP III guidelines.*

J Teh Univ Heart Ctr 2024;19(1):14-24

This paper should be cited as: Naji FS, Mirshekari M, Namazi S, Varpaei HA, Esteghamati A, Hemmatabadi M, Shirzad N. Knowledge and Performance of Iranian Internists Regarding Dyslipidemia According to Lipid Guidelines and their Relationships with Personal and Occupational Characteristics. J Teh Univ Heart Ctr 2024;19(1):14-24.

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Keywords: *Internal medicine; Lipid metabolism disorders; Knowledge; American heart association*

Introduction

Lipid metabolism disorders, including hypercholesterolemia and hypertriglyceridemia, are among the most common metabolic diseases that are increasing in global prevalence and are associated with many types of other chronic and metabolic disturbances, such as diabetes and hypertension.[1] Lipid metabolism disorders, which are relatively common in Iran, are observed in 35% to 42% of the Iranian population, both men and women. Among these, hypercholesterolemia is more common in Iranian women than in Iranian men, and hypertriglyceridemia is more common in Iranian men.[2]

Although lipid-lowering treatments prevent deaths from cardiovascular disease mortality and morbidity, they do not reduce overall mortality.[3] Dyslipidemia encompasses a wide range of abnormalities whose control plays a crucial role in preventing cardiovascular disease. Sometimes these disorders are secondary to other diseases (secondary dyslipidemia), such as hypothyroidism, and sometimes they are the result of interference between genetic and environmental factors.[4-6]

Different standard guidelines have been recommended and used to diagnose lipid disorders on the one hand and to determine the treatment algorithm on the other hand, the most important of which are from the American Heart Association (AHA), the American Association of Clinical Endocrinology (AACE), the European Society of Cardiology and the European Atherosclerosis Society (ESC-EAS), and the National Cholesterol Education Program and the Adult Treatment Panel III (NCEP-ATP-III). Nonetheless, in some cases, major differences exist between the mentioned guidelines.[7–10]

Indubitably, an understanding of these guidelines and the ability to use them can be useful for physicians specializing in internal medicine, endocrinology, or cardiology.[11, 12] Accordingly, a decision was made in 2021 to conduct the present study with a view to assessing Iranian internal medicine physicians' knowledge and practice concerning lipid disorders in accordance with the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines. The results of this study can determine the degree of compliance of physicians' clinical practice with international guidelines and, if necessary, can be used as a guide to improve the performance of local specialists in the field of these recommendations.

The present study aimed to determine the knowledge and performance of Iranian internal medicine physicians regarding lipid disorders according to the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines in 2021.

Methods

The present descriptive-analytical cross-sectional study selected 220 internists (internal medicine specialists) via convenience sampling from January through September 2021. A researcher-designed questionnaire was used to assess the knowledge and practice of physicians. The researcher-made questionnaire contained 25 designed questions regarding their knowledge and practice concerning lipid disorders according to the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines. The designed questionnaire is presented in the attached section (Supplement 1).

Proposed scenarios were designed with an emphasis on controversies in the guidelines. The questionnaire was developed by reviewing the questionnaires utilized in similar studies, analyzing them, and matching them with the objectives of the current study. The validity of the questionnaire was assessed with the content method after the confirmation of the presence of at least 10 tenured faculty members, and its reliability was tested with the test-retest method. The correlation coefficient of knowledge scores between the 2 stages was 0.92, and the correlation coefficient of performance scores between the 2 stages was 0.87, which was, therefore, considered statistically significant (P<0.001).

The inclusion criteria included having internal expertise and a willingness to participate in the study. Incomplete questionnaires were excluded. The questionnaires were distributed to the participants through e-mail or sharing in cyberspace in groups of the community of internal experts or in person. The completed questionnaires were collected and analyzed by the research assistant.

The study protocol was approved by the Research Ethics Committee of Tehran University of Medical Sciences (ethical approval code: IR.TUMS.IKHC.1400.077). Participation in the study was completely optional. The participants' identities and records are kept privately.

Data were collected using a researcher-made questionnaire containing questions about the sociodemographic profile, knowledge, and practice of internal medicine specialists according to international lipid guidelines.

The questionnaire features 3 questions related to the score obtained from physicians' performance (questions 22, 15, and 24) and 11 questions related to physicians' knowledge. For the questions to be scored, the correct answer received 1 point, and the wrong answer received 0

points. Consequently, the maximum knowledge score was 11, and the maximum performance score was 3. Ranking was based on the percentage of points obtained: 25% to 75% was considered moderate, above 75% good, and 25% or less poor.

Based on the 2 mean comparison formulas and considering the α (error of the first type of study) to the extent of 0.05, d (accuracy of the study) to the extent of 0.05, *P*=7 (frequency of appropriate knowledge about the guidelines of lipid disorders in previous studies by source No. 13), and 10% of the surplus sample due to possible questionnaire distortion, 200 physicians were chosen to participate in the study.

Finally, statistical analysis was conducted with the SPSS software, version 26. The knowledge and practice scores were compared using the Mann-Whitney *U* test for 2 groups of male and female physicians and the independent *t* test. For comparisons among more than 2 groups, the ANOVA test was employed. The Spearman correlation test was applied to assess the correlation between continuous variables, such as knowledge or practice scores with age and years of experience. The χ^2 test or the Fisher exact test was employed to examine the association between nominal variables. The significance level was set at a P value of less than 0.05.

Results

The study population consisted of 220 internists, 132 women (60%) and 88 men (40%), from cities of Iran. Most physicians were in the age group of 40 years and under (52.3%) and the fewest in the age group over 60 years (5.9%). The mean age of the physicians was 42.52±11.23 years.

The duration of activity as a general practitioner in 68.6% of the physicians was below 5 years, with a median of 2 years and a mean of 18.63±4.4 years. In 54.5% of cases, the duration of activity as a specialist was less than 5 years, with a median of 4 years and a mean of 9.41±7.86 years.

Additionally, 57.7% of physicians worked only in public hospitals, 25.0% only in non-governmental centers (including private hospitals and private offices), and 17.3% in non-governmental and governmental centers. Faculty members accounted for 15.9% of the study population.

In the treatment of dyslipidemia, 84.5% of the physicians based their decisions on the use of international guidelines, 30.5% on the use of scientific seminars and retraining courses, and 24.5% on the use of personal experience. The most commonly used guideline was the AHA (by 65% of the physicians), followed by the AACE (13.6%), the ESC-EAS (5.5%), and the NCEP-ATP-III (3.2%). Notably, 12.7% of the physicians did not use guidelines (Table 1).

Thirty percent of the physicians stated that the reason for not using the guidelines was the wide range of guidelines and lack of time, 14.1% lacked access to guidelines, and 6.8% trusted clinical experience as reasons for not following guidelines.

Table 1. Demographic Characteristics of the Participants

	n (%)
Years of Work as a General Practitioner	
0–4 y	152 (69.1)
5–9 y	41 (18.6)
>10 y	27 (12.3)
Years of Work as an Internist	
0–4 y	121 (55.0)
5–9 y	38 (17.3)
>10 y	61 (27.7)
Current Place of Professional Practice	
Governmental	127 (57.7)
Private	55 (25.0)
Both	38 (17.3)
Faculty Member	
Yes	35 (15.9)
No	185 (58.1)
The Basis of the Physician's Decision to Treat Dyslipidemia	
International guidelines	186 (84.5)
Scientific seminars and retraining courses	67 (30.5)
Personal experience	54 (24.5)
Guidelines Used	
AHA	143 (65)
AACE	30 (13.6)
ESC-EAS	12 (5.5)
NCEP-ATP-III	7 (3.2)
None	28 (12.7)
Reason for Not Using Guidelines	
Lack of access to guidelines	31 (14.1)
Extensive guidelines and lack of time	66 (30.0)
Trust in clinical experience	15 (6.8)

The knowledge of the evaluated internal medicine physicians vis-à-vis lipid disorders according to international guidelines was poor in 7 (3.2%), moderate in 209 (95.0%), and good in 4 (1.8%) (Table 2). For this category, the ratio of the correct answer of each physician to the total questions of the knowledge section was calculated: below 25% was considered poor, between 25% and 75% moderate, and between 75% and 100% good. The knowledge score was observed from the items of the questionnaire related to the treatment of lipid disorders in the range of 1 to 9, with an average of 5.75±1.58 (Table 2). Therefore, the lowest correct answer was 90.1%, and the highest correct answer was 81.8% of the total questions. On average, the assessed internal medicine physicians answered 52.27% of the questions correctly.

The performance of the evaluated internal medicine physicians in terms of lipid disorders according to international guidelines was poor in 25 (11.4%), moderate in 164 (74.5%), and good in 31 (14.1%). The physicians' practice scores were observed from the items of the questionnaire related to the treatment of lipid disorders in the range of 0 to 3, with an average of 1.51±0.87 (Table 2). On average, the evaluated internal medicine physicians answered 50.30% of the performance questions correctly.

Based on the results of the Spearman correlation coefficient test, an inverse and significant relationship was observed between the physicians' age and their knowledge of lipid disorders (P=0.048, r=−0.134). With increasing age, the physicians' knowledge about the treatment of lipid disorders significantly decreased; still, no significant correlation was observed between age and the physicians' practice in the treatment of lipid disorders (P=0.504 and P=0.045). An inverse and significant relationship was observed between years of work as an internal medicine physician and the physicians' knowledge concerning the treatment of lipid disorders (P=0.042, r=−0.137). As the years of work of the physicians increased, their knowledge about the treatment of lipid disorders significantly decreased. Nevertheless, no significant relationship existed between years of work as an internal medicine specialist and the performance of the physicians as regards the treatment of lipid disorders (P=0.203, r=0.086) (Table 3).

Table 2. Knowledge and Practice Scores and Categories

	Category n (%)	Mean±SD
Overall knowledge score		5.75±1.5
Poor	7 (3.2)	
Moderate	209 (95)	
Good	4 (1.8)	
Overall practice scores		1.51±0.87
Poor	25 (11.4)	
Moderate	164 (74.5)	
Good	31 (14.1)	

Table 3. Results of the Spearman Correlation Coefficient Test (n=220)

	r	P
Age (knowledge score)	-0.134	0.048
Age (practice score)	0.048	0.500
Years of work as an internal medicine specialist (knowledge score)	-0.137	0.042
Years of work as an internal medicine specialist (practice score)	0.086	0.203

Table 4. Knowledge and Practice Scores Based on the Participants' Demographics

	Mean±SD	Median	Test Statistics	P
Knowledge score			t= -2.128	0.033
Male	5.47±1.61	5.5		
Female	5.94±1.54	6.0		
Practice score			t= -0.465	0.640
Male	1.55±0.80	1.0		
Female	1.48±0.92	1.0		
Knowledge score			F= 8.066	0.018
Governmental centers	6.01±1.48	6.0		
Non-governmental centers (private)	5.22±1.83	5.0		
Governmental and non-governmental centers	5.66±1.36	6.0		
Practice score			F= 2.264	0.320
Governmental centers	1.49±0.86	1.00		
Non-governmental centers (private)	1.64±0.93	2.00		
Governmental and non-governmental centers	1.39±0.82	1.00		
Knowledge score			F= 13.063	0.001
Without using a guideline	5.29±1.30	5.00		
AHA	6.02±1.54	6.00		
Other guidelines	5.22±1.69	5.00		
Practice score				
Without using a guideline	1.14±0.85	1.00	F= 5.984	0.050
AHA	1.55±0.87	2.00		
Other guidelines	1.61±0.86	2.00		

The knowledge score on the treatment of lipid disorders had a mean of 5.94±1.54 and a median of 0.6 in the female physicians and an average of 5.47±1.61 and a median of 5.5 in their male counterparts. According to the results of the Mann-Whitney test, the knowledge score of the female internal medicine specialists was significantly higher than that of their male counterparts (P=0.033). With respect to the practice score on the treatment of lipid disorders, the female physicians had an average of 1.48±0.92 and a median of 0.1, while the male physicians had an average of 1.55±0.80 and a median of 0.1. Based on the results of the Mann-Whitney U test, no significant difference existed in performance scores between the male and female internal medicine specialists (P=0.642) (Table 4 & Figure 1).

The physicians working in governmental centers had an average knowledge score of 6.01±1.48 and a median of 0.6, those working in non-governmental centers had an average of 5.22±1.83 and a median of 5.5, and the ones working in both governmental and non-governmental centers had an average of 5.66±1.36 and a median of 0.6. According to the results, the physicians' knowledge score was significantly different based on their place of employment (P=0.018) (Table 4 & Figure 2).

The results of the Mann-Whitney post hoc test with Bonferroni adjustments showed that the knowledge score of the physicians working in non-governmental centers was significantly lower than that of the physicians working in governmental centers (P<0.050). The performance score for lipid disorders was 1.49±0.86 with a median of 1.0 in the physicians working in governmental centers, 1.64±0.93 with a median of 1.0 in those working in non-governmental centers, and 1.39±0.82 with a median of 1.0 in physicians working in both governmental and non-governmental centers. There was no significant difference in the performance score of the physicians based on their place of employment (P=0.322).

The knowledge score concerning lipid disorders had a mean of 5.29±1.30 and a median of 5.0 in the physicians who did not use international guidelines, a mean of 6.02±1.54 and a median of 6.0 in the physicians using the AHA recommendations, and a mean of 5.22±1.69 and a median of 5.0 in the physicians using other guidelines. The physicians' knowledge scores differed significantly based on their use of recommendations (P=0.001) (Figure 3).

The results of the Mann-Whitney post hoc test with Bonferroni adjustments revealed that the knowledge score of the physicians using the AHA guideline was significantly higher than that of the physicians using other guidelines and the physicians who did not use the guideline (P<0.050).

The performance score for lipid disorders had a mean of 1.14±0.85 and a median of 0.1 in the physicians who did not use international guidelines, a mean of 1.55±0.87 and a median of 2.0 in the physicians who followed the AHA guideline, and an average of 1.61±0.86 and a median of 2 in the physicians who adhered to other recommendations. Accordingly, the practice score of the physicians was significantly different based on their use of guidelines (P=0.050).

The performance score of the physicians using the AHA guideline and those following other guidelines was significantly higher than that of the physicians who did not follow recommendations (P<0.050).

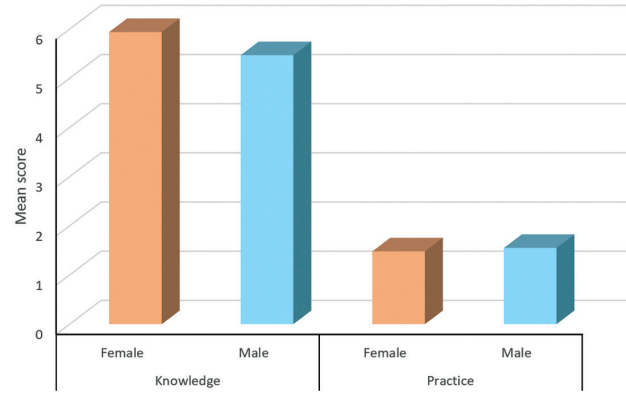

Figure 1. The image compares the knowledge and practice scores of the evaluated physicians according to sex.

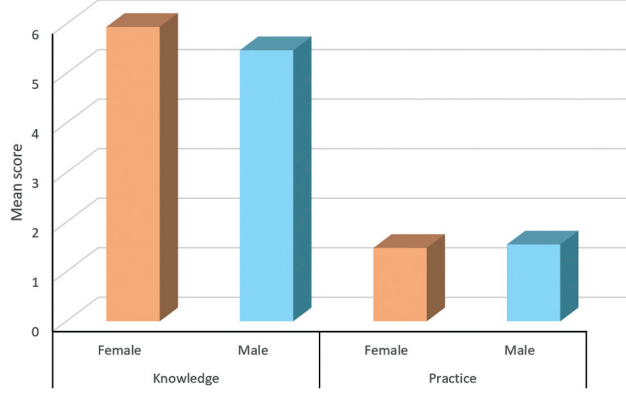

Figure 2. The image compares the knowledge and practice scores of the evaluated physicians according to the place of professional practice.

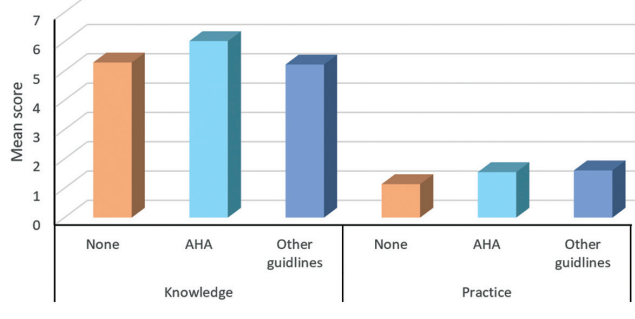

Figure 3. The image compares the knowledge and practice scores of the evaluated physicians according to the types of guidelines.

Discussion

The aim of the current study was to determine the knowledge and performance of internal medicine physicians concerning lipid disorders according to the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines and their relationships with some personal and occupational characteristics in Iran. The study population consisted of 220 internal medicine specialists, more than half of whom (60%) were women. Further, more than half of the study population was 40 years of age or younger, indicating that the participants were young.

The most prominent instructions used by the internists to treat dyslipidemia were international guidelines (84.5%). A study by Reiner et al[21] regarding the risk factors for cardiovascular disease (including dyslipidemia) found that most physicians believed that guidelines were helpful, but only 56.9% actually used some of the recommendations, and 40.2% preferred the Joint European guidelines. Therefore, it can be argued that the knowledge of treatment instructions does not necessarily lead to their use in treatment.

The most commonly used guidelines in our study were the AHA, the AACE, and the ESC-EAS, respectively. It is also noteworthy that 12.7% of the evaluated physicians did not follow any guidelines. The principal reason for the non-use of recommendations reported by the internists was their extensiveness and lack of time. The least prevalent reason for the non-use of guidelines was reliance on one's clinical experience. Vashitz et al[22] reported that physician adherence to dyslipidemia guidelines was influenced by factors such as the frequency of patient visits, a higher load of patients with dyslipidemia, the treatment of patients with multiple risk factors, working in hospitals with patients with high socioeconomic status, and the treatment of patients recently hospitalized for cardiac reasons. Although we did not assess these specific variables, their findings provide additional insights that align with ours. It is recommended that the training of physicians, especially general practitioners, be a priority. General practitioners as physicians in the primary healthcare system demonstrated poor knowledge of dyslipidemia guidelines (the AACE, the AHA, and the CCS) and understanding and application of the instructions in practice. Medical residents and internists, on the other hand, had a better understanding and application of dyslipidemia guidelines.[23]

The evaluated physicians' knowledge score analysis showed that most physicians (95%) obtained moderate knowledge scores. Almost 2% of the physicians scored well, and approximately 3% scored poorly. These results are consistent with previous studies. A previous investigation reported that while 80.6% of physicians believed that they treated patients with dyslipidemia well, only 53.3% knew the target value of low-density lipoprotein cholesterol for high-risk patients, and only 56.2% knew which level of high-density lipoprotein cholesterol indicated an increased risk.21 A study in Malaysia revealed that despite a notable gap between the knowledge and practice of postgraduate primary care trainees, the level of knowledge was categorized as good.13 Since the focus of our study was on internal medicine physicians, we were not able to compare different groups of physicians. The choice of medication required for the treatment strategy is also one of the issues examined, but we did not consider it. A study in Kuwait recommended an assessment of adherence to standards. Younger doctors were shown to be less informed and, thus, less able to utilize recommendations.[14] The availability of clinical guidelines was the most significant factor impacting clinical decision-making. Time constraints were cited as a major impediment by the majority of the physicians (72.4%). The American College of Cardiology/AHA recommendation for the management of high blood cholesterol was the most frequently used lipid guideline in everyday practice.

Two important correlations were found in the results: knowledge concerning the treatment of lipid disorders was inversely correlated with age, and performance in the treatment of lipid disorders was positively correlated with age. With increasing age, the knowledge score on the treatment of lipid disorders may decrease. However, the performance score increased with the age of the evaluated physicians. Still, both correlations were categorized at a weak level.

Our analysis of knowledge and practice scores based on sex demonstrated that although there was no statistically significant difference in performance scores between the male and female physicians, the score of the knowledge of the female physicians was statistically significantly higher than that of their male counterparts. One of the salient reasons for this finding could be the imbalance of the study population, more than half of which were women. Nonetheless, more research is needed to prove causal relationships.

While no statistically significant correlation was found between work experience and the physician performance score, the knowledge score had a negative correlation with the evaluated physicians' years of work. Increasing the number of years of work history led to a decrease in the knowledge score. The correlation may be due to the greater reliance of physicians with experience on their clinical experience.

In line with the results of our study, it has been suggested that most primary care physicians (called "general practitioners" in Iran) use their personal experiences in prevention, while internal medicine and cardiologists are more inclined to follow guidelines.[21]

The place of professional activity did not make a significant difference in the performance score of the physicians in the present study. In contrast, the knowledge score was significantly different based on the place of professional activity. The physicians working in governmental centers received the highest knowledge scores, while those working in private centers received the lowest knowledge scores.

Additionally, it is assumed that physicians' knowledge of lipid management correlates to a high degree with their professional status.[24] The reason for the higher knowledge scores among the physicians working in the public sector might be constant communication with students, residents, and other faculty members; participation in retraining courses; and participation in various journal clubs. Cabana et al[25] cited other reasons (unrelated to physician age) why physicians might not adhere to guidelines, including a lack of knowledge of the recommendations, disagreement with the evidence, and a lack of expectation that adherence will result in better patient outcomes.

The type of guideline used in the treatment of lipid disorders may also affect knowledge and performance scores. The physicians who used the AHA guidelines scored significantly higher than those who adhered to other guidelines or no guidelines. Nevertheless, physicians who used other guidelines gained higher performance scores than those who followed the AHA or no guidelines. In a study of Iranian clinical pharmacists, most participants claimed to have adhered to the American College of Cardiology/ AHA guideline in the treatment of dyslipidemia; however, there were no significant differences in scores according to guideline selection.[26]

The present study is one of the first investigations to assess the knowledge and practice of internal medicine physicians in the field of lipid disorders in Iran. The principal limitations of this study were, however, the average sample size, the use of an online questionnaire (considering the prevalence of coronavirus), and the participants' inadequate cooperation due to time constraints. We recommend that these limitations be addressed in future research. In addition, the focus of this study was on internal medicine physicians. We suggest that comparative studies be performed between specialists in different fields, such as cardiology and pharmacology.

Conclusion

The knowledge and performance of Iranian internal medicine physicians vis-à-vis lipid disorders were moderate according to the AHA, AACE, ESC-EAS, and NCEP-ATP-III guidelines. As the age of internal medicine physicians increased, the knowledge score decreased; nonetheless, the practice score rose with age. The knowledge scores of female specialists and physicians working in government centers were significantly higher. It appears that continuous training programs for physicians after graduation should be taken into consideration in the formulation of medical education programs. Moreover, continuous education regarding updated global guidelines can help keep physician knowledge up-to-date.

Acknowledgments

We would like to thank the Deputyship of Research at Tehran University of Medical Sciences and the Imam Khomeini Hospital Complex.

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Supplemental

Questionnaire of the study

Questionnaire to evaluate the knowledge and practice of internal medicine physicians about lipid disorders according to international guidelines

General information

1- Gender: please choose one
☐ Female
☐ Male

2 – Age: ..... (years)

3- Years of work as a general practitioner : ..... (years)

4- Years of work as an internal specialist : ..... (years)

5- University where the degree is obtained: ..... (name of university)

6- City which you were/are working as professional career in the last 5 years: ..... (name of city)

7- Current place of service: (you can choose more than one option)
A. Government Hospital
B. Non-governmental hospital (covered by insurance organizations)
C. Private office or clinic

8- Are you a university faculty member: please choose one
A. Yes
B. No

9- Which of the following is the basis of your decision in the treatment of dyslipidemia? (You can choose more than one option)
A. International guidelines
B. Scientific seminars and retraining courses
C. Personal experience

10- If you use guidelines, which of the following do you use?
A. AHA (American Heart Association)
B. AACE (American Association of Clinical Endocrinology)
C. The ESC-EAS (European Society of Cardiology and European Atherosclerosis Society)
D. NCEP-ATP-III (National Cholesterol Education Program - Adult Treatment Panel-III)

11- In case of not using the guidelines, which of the following is the reason?
A. Lack of access to guidelines
B. Extensive guidelines and lack of time
C. Trust in clinical experience

12- By definition, which of the following is referred to as Hypertriglyceridemia in adults? (In mg / dL)
A. TG more than 149
B. TG more than 199
C. TG more than 499

13- Which of the following is a high LDL international guideline (mg / dL)?
A. 100 ≤ LDL
B. 160≤ LDL
C. It varies from person to person depending on the risk factors

14- Which situation is acceptable for dyslipidemia screening?
A. Fasting status is required
B. Non-fasting status is acceptable

15- Do you use cardiovascular risk assessment tools in treatment decisions?
A. Yes
B. No

16- In which of the following cases is it necessary to rule out secondary causes of hypertriglyceridemia?
A. TG ≤ 150 mg / dL
B. TG ≤ 500 mg / dL
C. TG ≤ 1000 mg / dL

17- A 48-year-old man with no history of cardiovascular disease and diabetes has a lipid profile of 300 mg / dL = TG. Which of the following do you choose for treatment?
A. Diet and exercise
B. Diet, exercise and treatment with fibrates
C. Diet, exercise and omega-3 therapy

18- What is the target of LDL-C, a 52-year-old woman with type 2 diabetes who has microalbuminuria in urinalysis?
A. Less than 55 mg / dl
B. Less than 70 mg / dl
C. Less than 100 mg / dl

19- The patient is a 46-year-old man with a 10-year history of type 2 diabetes who has not yet received anti-lipidemia drug. The patient has a good lifestyle and has no other risk factors. In tests, LDL-C = 70 mg / dl. Which treatment option do you choose?
A. Atorvastatin 20 mg daily
B. Atorvastatin 10 mg daily
C. No need for medical treatment

20- The patient is a 59-year-old woman with a history of ischemic stroke and MI who is being treated with rosuvastatin 40 mg daily. She currently has LDL-C = 65 mg / dl. Which option do you choose?
A. Replacement of rosuvastatin with atorvastatin 80 mg daily
B. Add Ezetimibe.
C. No further action is required

21- Which of the following types of statin compounds does not require dose adjustment in patients with stage 4 and 5 chronic renal disease?
A. Atorvastatin
B. Rosuvastatin
C. Simvastatin

22- A 30-year-old woman is being treated with atorvastatin 20 mg daily and intends to become pregnant. Which of the following do you recommend to the patient?

A. Discontinue atorvastatin at the onset of pregnancy
B. Continue atorvastatin during pregnancy
C. Discontinue atorvastatin 2 months before pregnancy

23- Which of the following is in the category of very high risk in the evaluation of lipid disorders?

A. A history of acute coronary syndrome
B. A diabetic patient with a history of ischemic stroke
C. Patient with chronic renal disease (CKD) with GFR = 25 cc / min

24- A 40-year-old female head of household with no history of cardiovascular disease and diabetes has presented with LDL-C = 200 mg / dl. Which treatment do you recommend?

A. Atorvastatin 20 mg daily
B. Rosuvastatin 10 mg daily
C. Atorvastatin 20 mg daily or Rosuvastatin 10 mg daily

25- In case of diabetes after starting treatment with statins, which of the following measures is appropriate?

A. Reduce the dose of the drug
B. Discontinue treatment with statins
C. Continue treatment with statins