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Management of Hyperlipidemia in Family Medicine Practice: Review

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Abstract: **Hyperlipidemia has been recognized as a crucial cardiovascular risk factor for both females and males, and the National Heart, Lung, and Blood Institute (NHLB1) now has lipid standards for men and women. Present study main goal was to evaluate and discuss the management approaches of hyperlipidemia in family practice (primary care), this review also intended to review the evidence on the screening methods for hyperlipidemia through family physicians. MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) and the Cochrane Database were searched until December 2016. Reference lists were also searched manually. Family doctors have the prospective to make a major influence on decreasing the burden of heart disease through the optimum evaluation and management of hyperlipidemia. The emergence of statins as a safe and effective, although expensive, treatment for hyperlipidemia and the advancement of scientific standards advocating their increased use will place family physicians under included pressure to screen for and deal with hyperlipidemia**

Keywords: **Hyperlipidemia, MEDLINE, EMBASE, CINAHL, Cochrane Central Register.**

1. INTRODUCTION

Cardiovascular disease (CVD) is the leading reason for mortality in the United States, representing 33.6 percent of all deaths in 2007 [(1)]. Hyperlipidemia has been recognized as a crucial cardiovascular risk factor for both females and males, and the National Heart, Lung, and Blood Institute (NHLB1) now has lipid standards for men and women [(2)]. Recent research studies have actually shown that as much as 63% of ladies with CVD are not meeting the NHLBI-recommended goals for hyperlipidemia management, particularly the management of low-density lipoprotein (LDL) levels [(3)]. Despite the fact that at any provided age, the occurrence of coronary cardiovascular disease (CHD) is less in ladies than in guys, more women pass away from heart disease as a result of their extended life expectancy [(4)]. Current decreases in mortality rate from cardiovascular disease for women have been less than those for men [(5)]. These mortality differences in between genders exist because heart disease in females is without treatment and often undetected until the disease has become extreme. The majority of ladies do not perceive heart disease as a considerable health issue and report that they are not well notified about their risk [(6)]. A major objective for family doctor in main caring for patients with CHD focuses on the management of risk factors known to be associated with reoccurring cardiovascular events [(3,6)].

Present study main goal was to evaluate and discuss the management approaches of hyperlipidemia in family practice (primary care), this review also intended to review the evidence on the screening methods for hyperlipidemia through family physicians

2. METHODOLOGY

MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) and the Cochrane Database were searched until December 2016. Reference lists were also searched manually. There were English language restrictions for literature search. We intended to discuss and demonstrate some guidelines for family physicians to help them in their management control of hyperlipidemia patients.

3. RESULTS

Screening of hyperlipidemia in primary care:

An essential step in the interpretation of lipid screening results is the performance of a cardiovascular risk assessment. This point is strongly emphasized in the report of ATP-III and in numerous peer examined journal posts evaluating the topic of lipid management. The fundamental principle is that the greater an individual's CVD risk, the greater the benefit in aggressively dealing with all modifiable risk factors, consisting of hyperlipidemia. Any doctor who is translating the results of a lipid panel has to take the time to do a formal CVD risk analysis. Among the most commonly utilized verified instruments is the Framingham Risk Score. It has a number of constraints such as underestimating the risk in a high risk person due to the absence of some crucial risk factors in the scoring system [7]. Therefore, others have actually tried to enhance the scoring system in order to more precisely approximate the risk of a significant cardiovascular occasion in varying groups [8,9].

The National Cholesterol Education Program (NCEP) [10], a program within the National Institute of Health's Heart, Lung, and Blood Institute, released a guideline in (2004) for screening and dealing with hyperlipidemia. Physicians have actually considering that ended up being familiar with the NCEP concept of basing treatment choices on assessment of patient risk factors (smoking, age, diabetes, hypertension, family history of early coronary artery disease [CAD] and application of algorithms connected to preferred low-density lipoprotein (LDL) cholesterol levels. The advantage of this method is its simplicity. Physicians examine whether the NCEP risk factors are present then work with their patients to achieve the desired LDL level through lifestyle modification, drug treatment, or both [10].

The NCEP has actually acknowledged the value of this method by incorporating the Framingham tables to calculate the 10-year risk of developing medical CAD based upon a patient's private risk factors, including cholesterol levels (**see appendix Table 1**) [10].

The NCEP created a requirement utilizing lipid levels in 2001 that is still the most typically used clinical classification [11] (**Table 2**).

Table 2: Classification of hyperlipidemias as defined by the NCEP ATP 3. All concentrations are expressed as mg/dL [10]

LDL Cholesterol	
<100	Optimal
100 – 129	Near or above optimal
130 – 159	Borderline high
160 – 189	High
≥ 190	Very high
Total Cholesterol	
<200	Desirable
200 – 239	Borderline high
≥ 240	High
HDL Cholesterol*	
<40	Low
≥ 60	High
Triglycerides	
<150	Normal
150 – 199	Borderline high
200 – 499	High
≥ 500	Very high

In addition, hypertriglyceridemia and postprandial lipemia might impact the measurement of HDL cholesterol and for that reason the computation of non-HDL cholesterol. The NCEP ATP III arbitrarily divided fasting serum triglycerides into four various classes [11] as laid out in (**Table 2**) Classification of serum triglyceride levels greater than 150 mg/dl (1.7 mmol/liter) as raised is mainly based on big prospective observational studies. Nevertheless, the exact level at which serum triglycerides start to confer risk or become a marker for CVD is unknown, but it may be even lower than 150 mg/dl (1.7 mmol/liter) [12]. Serum triglycerides are higher in males and increase with age in both sexes [13]. A serum triglyceride level of 150 mg/dl (1.7 mmol/liter) usually falls below the 75th percentile in different populations, although there have actually been reputable differences recognized in between racial and ethnic groups [14].

Management and prevention of hyperlipidemia in family practice:

U.S., U.K., and Canadian guidelines are available to assist physicians handle hyperlipidemia (Appendix, Table 1) [10,15,16]. These guidelines concur that restorative lifestyle modifications are the essential of hyperlipidemia management, and that LDL cholesterol need to be the primary target of therapy. Treatment of hyperlipidemia improves results for patients with recognized coronary heart problem (CHD) or the risk equivalent, and for high-risk patients (i.e., those with a 10-year CHD risk of greater than 20 percent) without known CHD or the risk equivalent. Main avoidance of CVD includes treating patients with hyperlipidemia prior to scientific CHD manifests (e.g., myocardial infarction). The evidence supporting treatment of hyperlipidemia for main prevention is irregular. Patients with the highest standard risk are most likely to benefit. Medications must be selected based on a beneficial balance in between the possibility of benefits (e.g., patient-oriented outcomes, mortality, CVD events, functional status, lifestyle) and damage (negative results), as well as expense [17]. Regardless of the recommendations, it is useful to think about how effective the medical community has been in meeting guideline objectives. A nationwide survey performed in 2003 (NEPTUNE II) showed 67% of the 4,885 patients with elevated cholesterol attained their LDL cholesterol treatment objective [18]. Information from the National Health and Nutrition Examination Surveys (NHANES) document a constant decline in overall cholesterol over several decades so that in 2002 no more than 17% of US grownups had a total cholesterol level ≥ 240 mg/dL. More recent data from a similar survey in 2008 show that the Healthy People 2010 goal of a typical cholesterol listed below 200 mg/dL in all grownups ages 20 - 74 was satisfied in both males and females by 2008 [19]. The apparent issue in keeping track of these trends is that the percent of the population at or below goal differs significantly by demographic specifications. It is useful for every practice to perform quality studies in its own population to determine how well existing standards are satisfied and to believe innovatively about center initiatives that can attend to suboptimal treatment.

Lifestyle modification is the initial step to reduce cholesterol levels. Changes in diet plan, weight loss and increased exercise are all known to be effective. What is likewise well known is the difficulty in accomplishing these objectives. There are major limitations in the majority of weight loss studies. For example, weight reduction programs show weight reduction lowers both cholesterol and TG but long term practically half of the initial weight-loss is restored after 1 year [20]. In a current review of numerous weight-loss diet plans, the authors concluded that the type of diet is less important than the its palatability and the ease of continuing it long term [21]. Given these advantages to lifestyle modification, it might be prudent to accomplish lipid decreasing objectives by initiating medications earlier rather than later. If life style modification goals are accomplished, the requirement for medication can be reassessed [21].

- ***Pharmacological options in treatment of hyperlipidemia in family practice:***

Statins:

Statins are shown in virtually all patients with a history of CHD, reducing the risk of all-cause death (NNT = 50 for five years) and cardiovascular death [22]. Many patients with a CHD risk equivalent likewise benefit from statin therapy. The ATP III standards recommend starting statins in patients with a history of CHD, and adjusting the intensity of therapy to attain at least a 30 to 40 percent reduction in LDL cholesterol or an outright LDL cholesterol level listed below 70 mg per dL (1.81 mmol per L) or 100 mg per dL (2.59 mmol per L) [10]. The Canadian guidelines recommend a comparable treat-to-target method.4 The NICE guidelines advise simvastatin (Zocor), 40 mg, for all patients with scientific evidence of CHD and a higher-intensity statin for patients with acute coronary syndrome [15].

Statins may benefit patients with CHD independent of baseline cholesterol levels or age [22,23,24]. The effectiveness of statin therapy on lowering death, myocardial infarction, and stroke does not appear to differ among atorvastatin (Lipitor), pravastatin (Pravachol), and simvastatin [25]. No study has straight compared comparable dosages of 2 different statins for

secondary avoidance. The perfect beginning dosage in patients with CHD depends on the existence of severe coronary syndrome [25].

Alternatives to statins:

Although statins have reached the status of favored treatment for hyperlipidemia, there are needs to consider other medications. Some physicians feel that monotherapy is more effective, while others think that low to moderate dosages of combinations of drugs produce much better LDL-C decrease with fewer negative effects. There are times when statin treatment is maximal, but the lipid objectives have actually not been met. Lastly, there are circumstances in which statins are either contraindicated or not tolerated. A full evaluation of these choices is beyond the scope of this paper. A number of studies have taken a look at contrasts of drug mixes [27]. Some of the restorative alternatives are listed in (Table 3) [27].

Table 3: Statin alternatives [27]

Drug	Effect	Adverse effect
Bile acid sequestrants		
Cholestyramine (4–16 g) Colestipol (5–20 g) Colesevelam (2.6–3.8 g)	LDL −15–30% HDL +3–5% TG No change or increase	Gastrointestinal distress Constipation Decreased absorption of other drugs
Nicotinic acid		
Immediate release (crystalline) nicotinic acid (1.5–3 gm), extended release nicotinic acid (Niaspan®) (1–2 g), sustained release nicotinic acid (1–2 g)	LDL −5–25% HDL +15–35% TG −20–50%	Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity
Fibric acids		
Gemfibrozil (600 mg BID) Fenofibrate (200 mg) Clofibrate(1000 mg BID)	LDL −5–20% (may be increased in patients with high TG) HDL +10–20% TG −20–50%	Dyspepsia Gallstones Myopathy
Ezetimibe		
Zetia (10 mg daily) As monotherapy, often combined with a statin	LDL-C −18% HDL-C +3% TG −8%	Diarrhea Arthralgia Nasopharyngitis or Sinusitis Controversial regarding reduction of CVD events
Omega 3 fatty acids		
Lovaza Fish Oil Plant sources	Prescription fatty acid ester indicated only for treatment of TG > 500 mg/dl to prevent pancreatitis Fish oil has been shown to reduce elevated TG with subsequent mild reduction in LDL and non-HDL-C; however a recent major study showed no benefit from fish oil capsules; consumption of fish is preferred. Plant sources of omega-3 FA have been subjected to few clinical trials with CVD endpoints	

Family physician's attitude toward the management of hyperlipidemia:

We identified large survey study [28] that aimed to examine the knowledge, beliefs, and self-reported practice patterns of a representative sample of family doctor relating to the assessment and management of hyperlipidemia. Survey participants spent, usually, 89% (SD = 12) of their professional effort on scientific practice, 8% (SD = 9) on administration, 3% (SD = 5.7) on teaching, and less than 1% (SD = 1.4) on research study. Based on bivariate analytical comparisons in between survey participants and the population of AAFP active members on available demographic qualities drawn from the AAFP master database, the 2 groups did not vary statistically on age (47.3 versus 46.9, Z = 1.13, P >.05), years in practice (19.3 versus 18.9, Z = 1.24, P >.05). This study revealed that approximately 96% of family doctor reported recommending statin medications regularly for patients with recognized coronary heart problem (CHD). Offered a patient with recognized CHD, LDL = 120 mg/dL, and on a leading dose of statin, participants were asked (yes versus no) whether they would include a 2nd drug to bring the patient's LDL cholesterol to <100 mg/dL. If "yes," respondents were asked what second agent they would most likely use among fibrate, niacin, cholesterol absorption inhibitor, bile acid sequestrant, plant stanol/sterol ester, or other. A total of 92% of respondents reported they would add a second agent to lower the patient's LDL cholesterol below 100 mg/dL. Among those respondents, the most likely drug recommended was a cholesterol absorption inhibitor (60%), followed by niacin (21%), fibrate (9%), bile acid sequestrant (5%), and other (5%) [28]. Given a patient with diabetes mellitus and an LDL cholesterol > 130 mg/dL who is already treated with a moderate dose of statin, optimum way of life management and ideal glycemic control, 60% of responders would increase the dosage of the existing statin, 26% would add a 2nd drug, 14 % would switch to a more powerful statin, and just 1 % would refer to a lipid expert. Other management decisions concerning abnormal liver function tests and monitoring of CPK by family physicians relating to hyperlipidemia are summarized in (**Table 4**) [28].

Table 4: Self-reported Hyperlipidemia Management Practices of Family Physicians [28]

Item and Response Category	Percentage %
"If a patient's hyperlipidemia is *uncontrolled*, how frequently do you typically see the patient?" (N = 627)	
<4 visits per year	27
4 visits	53
4–6 visits	16
>6 visits	4
"If a patient's hyperlipidemia is *controlled*, how frequently do you typically see the patient?" (N = 628)	
<2 visits per year	26
2 visits	49
2–4 visits	23
>4 visits	1
If patient is on statin, "What is your most likely next step if the LFPs are normal but the lipid is abnormal?" (N = 637)	
Restart statin at lower dose	10
Change to different statin	57
Switch class of drug	30
Other	4
"How often do you monitor CPK in patients on statin therapy for hyperlipidemia?" (N = 636)	
Baseline and if symptoms	14
Periodically	12
Only if symptoms	67
Only high risk patients	2
Other	5

4. CONCLUSION

Family doctors have the prospective to make a major influence on decreasing the burden of heart disease through the optimum evaluation and management of hyperlipidemia. The emergence of statins as a safe and effective, although expensive, treatment for hyperlipidemia and the advancement of scientific standards advocating their increased use will place family physicians under included pressure to screen for and deal with hyperlipidemia. While the general worth of way of life modifications is acknowledged in national recommendations, more efficient methods for physicians to execute them effectively in ambulatory settings are needed. An optimum evidence-based approach to hyperlipidemia uses the brand-new NCEP III standard, which combines traditional risk factor evaluation with evaluation for CAD using the Framingham tables to determine LDL objectives and proper treatment techniques. Statins are first-line agents for patients who are prospects for drug treatment.

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APPENDIX - A

Table 1: Summary of Major Hyperlipidemia Management Guidelines in family practice:

RISK CATEGORY	*LDL CHOLESTEROL GOAL*	*DRUG THERAPY RECOMMENDATIONS*
National Cholesterol Education Program, Adult Treatment Panel III[*] [(10)]		
High risk CHD or risk equivalent† 10-year CHD risk > 20 percent	< 100 mg per dL (2.59 mmol per L) Optional goal of < 70 mg per dL (1.81 mmol per L) is favored in patients at very high risk (CHD plus multiple major or poorly controlled risk factors)	Initiate if LDL cholesterol is ≥ 100 mg per dL Consider if level is < 100 mg per dL‡
Moderately high risk ≥ two risk factors§ 10-year CHD risk of 10 to 20 percent	< 130 mg per dL (3.37 mmol per L) Optional goal < 100 mg per dL	Initiate if LDL cholesterol is ≥ 130 mg per dL Consider if level is 100 to 129 mg per dL (2.59 to 3.34 mmol per L)‖
Moderate risk ≥ two risk factors§ 10-year CHD risk < 10 percent	< 130 mg per dL	Consider if LDL cholesterol is ≥ 160 mg per dL (4.14 mmol per L)
Low risk One or no risk factors§	< 160 mg per dL	Consider if LDL cholesterol is ≥ 190 mg per dL (4.92 mmol per L)
National Institute for Health and Clinical Excellence [(15)]		
Primary prevention	No target level for total or LDL cholesterol	Initiate simvastatin (Zocor), 40 mg daily, if CHD risk is ≥ 20 percent (routine measurement of lipid levels is not necessary)
Secondary prevention	< 78 mg per dL (2.02 mmol per L)	Initiate simvastatin, 40 mg daily, as soon as possible Consider increasing dosage to 80 mg daily if LDL cholesterol goal is not achieved Consider a higher-intensity statin in patients with acute coronary syndrome
Canadian Cardiovascular Society [(16)]		
High risk CHD, peripheral vascular disease, atherosclerosis (i.e., any vascular bed, including carotid arteries) Usually diabetes mellitus Framingham or Reynolds risk score ≥ 20 percent	< 78 mg per dL or 50 percent LDL cholesterol reduction (alternate apolipoprotein B level < 80 mg per dL [0.80 g per L])	Offer treatment to all patients
Moderate risk Framingham risk score 10 to 19 percent	< 78 mg per dL or 50 percent LDL cholesterol reduction (alternate apolipoprotein B level < 80 mg per dL)	Consider for patients with any of the following factors: LDL cholesterol > 136 mg per dL (3.52 mmol per L) Total/HDL cholesterol > 193 mg per dL (5 mmol per L)

RISK CATEGORY	*LDL CHOLESTEROL GOAL*	*DRUG THERAPY RECOMMENDATIONS*
		High-sensitivity CRP > 2 mg per L (19.05 nmol per L) Men older than 50 years Women older than 60 years Family history and high-sensitivity CRP increases risk (Reynolds risk score)
Low risk Framingham risk score < 10 percent	≥ 50 percent reduction in LDL cholesterol	Consider if LDL cholesterol is ≥ 193 mg per dL (5 mmol per L)

CHD = coronary heart disease; CRP = C-reactive protein; HDL = high-density lipoprotein; LDL = low-density lipoprotein.

* *Intensity of drug therapy should be sufficient to achieve at least a 30 to 40 percent reduction in LDL cholesterol.*

† *CHD = history of myocardial infarction, unstable angina, stable angina, coronary artery procedures, or evidence of clinically significant myocardial ischemia; risk equivalent = peripheral arterial disease, abdominal aortic aneurysm, carotid artery disease, diabetes, two or more risk factors with 10-year CHD risk > 20 percent.*

‡ *Initiation of drug therapy is an option on the basis of available clinical trial results.*

§ [corrected] *Cigarette smoking; hypertension (systolic blood pressure ≥ 140 mm Hg or on antihypertensive therapy); low HDL cholesterol (< 40 mg per dL [1.04 mmol per L]); family history of premature CHD (male first-degree relative younger than 55 years, female first-degree relative younger than 65 years); age 45 years or older in men, age 55 years or older in women.*

‖—*Initiation of drug therapy to achieve an LDL cholesterol level < 100 mg per dL is an option on the basis of available clinical trial results.*