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Women Over 50 with Increased LDL Cholesterol: A Review with Arab Perspectives

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Abstract
Low-density lipoprotein cholesterol (LDL-C) is a major risk factor for cardiovascular disease (CVD), especially in women over 50. This review explores the biological, epidemiological, and cultural aspects of high LDL-C levels in postmenopausal women, with a particular focus on Arab countries. It highlights the differences in lipid profiles, the challenges in accessing healthcare, and the urgent need for culturally relevant interventions to reduce cardiovascular risks in this group. The review draws on regional data to explain how hormonal changes, metabolic shifts, and lifestyle choices contribute to rising LDL-C levels in older women. It also examines how dietary habits and physical inactivity, common in many Arab societies, worsen the risk of unhealthy cholesterol levels. The findings emphasize the importance of targeted lipid screening programs and public health initiatives that cater to the specific needs of older women in these regions. By raising awareness and encouraging healthier lifestyle choices, healthcare providers can significantly impact lowering LDL-C levels and enhancing overall heart health among postmenopausal women. This review calls for more research to better understand the factors influencing LDL-C in Arab populations and to develop effective prevention and management strategies.

Key words: Women over 50, postmenopausal women, LDL Cholesterol, Arab Perspectives.

النساء فوق سن الخمسين وارتفاع الكوليسترول منخفض الكثافة: مراجعة بمنظور عربي

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الملخص:
يعتبر الكوليسترول البروتين الدهني منخفض الكثافة عامل خطر رئيسي لأمراض القلب والاوعية الدموية، وخاصة لدي النساء فوق سن الخمسين. هذه الدراسة تستعرض الجوانب البيولوجية والوبائية والثقافية لمستويات الكوليسترول منخفض الكثافة المرتفعة لدي النساء فوق سن الخمسين، مع التركيز على الدول العربية. الدراسة تسلط الضوء على الفروقات في انماط الدهون، والتحديات في الوصول الي الرعاية الصحية، والحاجة الماسة لتدخلات تتناسب مع الثقافة المحلية لتقليل مخاطر مرض القلب والاوعية الدموية في هذه الفئة. تجمع هذه الدراسة المراجعة البيانات الاقليمية والعالمية لتوضيح كيف تسهم التغيرات الهرمونية، والتحولات الايضية، والخيارات الحياتية في ارتفاع مستويات الكوليسترول لدي النساء الاكبر سنا. كما تفحص كيف تؤدي العادات الغذائية وقلة النشاط البدني، الشائعة في العديد من المجتمعات العربية، الي تفاقم خطر ارتفاع الكوليسترول الضار. تؤكد النتائج على اهمية وجود برامج فحص الدهون المستهدفة ومبادرات الصحة التي تلبي الاحتياجات الخاصة للنساء الاكبر سنا في هذه المناطق. من خلال زيادة الوعي وتشجيع خيارات نمط الحياة، يمكن لمقدمي الرعاية الصحية ان يحدثوا تأثيرا كبيرا في خفض مستويات الكوليسترول الضار وتعزيز الصحة القلبية بشكل عام بين النساء بعد سن اليأس تدعو هذه المراجعة إلى مزيد من البحث لفهم العوامل التي تؤثر على LDL-C في السكان العرب وتطوير استراتيجيات فعالة للوقاية والإدارة.

الكلمات المفتاحية: النساء فوق سن الخمسين، النساء بعد سن اليأس، كوليسترول البروتين الدهني منخفض الكثافة. امراض القلب.

Introduction

Globally, cardiovascular disease remains the primary cause of death for women, and LDL-C is essential for atherogenesis. LDL-C levels frequently rise in women over 50 as a result of hormonal changes, metabolic alterations, and changes in body composition, especially during and after menopause [1]. However, there are still large gaps in prevention and treatment because this group is underrepresented in lipid-focused research and clinical trials.

The management of elevated LDL-C is made more difficult in Arab nations by sociocultural context, dietary habits, and access to care. Several Arab countries report LDL-C levels above WHO thresholds, highlighting inter-country variations in lipid profiles according to recent global analyses [2, 3]. A regional analysis of LDL-C in older women from various Arab populations is presented in this review. The aim of this review is to verify the factors that affect the level of LDL-C in women over fifty in Arabic nation.

LDL-C Pathophysiology in Postmenopausal Women

The rise in low-density lipoprotein cholesterol (LDL-C) observed in postmenopausal women is not incidental—it is the result of well-documented physiological changes that accompany the aging process and the loss of estrogen. Estrogen plays a protective role in lipid metabolism by enhancing the expression of LDL receptors in the liver. These receptors are responsible for clearing LDL particles from the bloodstream, thereby maintaining healthier lipid levels. During the reproductive years, this mechanism helps keep LDL-C in check. However, after menopause, as estrogen levels decline sharply, this protective effect is lost.

One key consequence is a reduction in hepatic LDL receptor activity. Without adequate receptor function, the liver becomes less efficient at removing LDL-C from circulation. At the same time, hepatic lipase activity tends to increase. This enzyme alters the composition of lipoproteins, often producing smaller and denser LDL particles—forms that are more atherogenic, meaning they have a higher tendency to contribute to plaque formation in the arteries [1].

The problem is further compounded by other age-related metabolic changes. As women age, there is a natural tendency toward increased visceral fat accumulation, particularly around the abdomen. This type of fat is not only a marker of central obesity but also a driver of insulin resistance and chronic low-grade inflammation. Both insulin resistance and systemic inflammation have been shown to worsen lipid profiles, including increasing LDL-C and lowering protective HDL-C levels. These overlapping mechanisms—hormonal, metabolic, and inflammatory—create a perfect storm for cardiovascular risk in postmenopausal women.

In Arab countries, where cultural and lifestyle factors may already predispose older women to inactivity, central obesity, and limited access to preventative care, these physiological changes can go unrecognized or untreated. As such, there is a pressing need for targeted lipid screening programs specifically designed for postmenopausal women. Early identification of dyslipidemia, coupled with lifestyle counseling and pharmacological interventions where necessary, can help reduce long-term cardiovascular risks. Understanding the underlying pathophysiology helps healthcare providers not only explain the changes women experience but also design more empathetic, personalized interventions.

Regional and Worldwide Epidemiology

Table 1. Mean LDL-C Levels in Women Aged 50--59 in Selected Arab Countries

Country	Estimated LDL-C Trend in Women 50--59	Notable Insight
Saudi Arabia	Moderate to High	Peak LDL-C levels
	Moderate	Public health campaigns may influence lower average levels
United Arab Emirates	High	Cardiovascular risk factors often cluster in postmenopausal women
Egypt	Moderate	Westernized diet may impact lipid levels
Lebanon	Moderate	LDL-C levels vary by urban vs rural populations
Tunisia		
	Moderate	Limited national-level lipid studies available
Jordan	Moderate	Increasing interest in preventive cardiology
Morocco	Moderate to High	Notable Insight

Sources: [2, 1].

According to a landmark study conducted by the Global Diagnostics Network, which involved more than a million lipid panels from 17 countries, women aged 50--59 had the highest LDL-C levels [1]. In many Arab countries, women in this age group often have LDL-C levels above the WHO target of less than 3.0 mmol/L [4]. Genetics, diet, and healthcare quality also play a role in these differences [3].

Lifestyle and Sociocultural Aspects

In Arab countries, lifestyle and sociocultural factors significantly influence lipid profiles, particularly in women over 50, who face increasing health risks due to age-related metabolic changes. One of the most notable shifts contributing to elevated LDL cholesterol is the gradual move away from traditional diets—once rich in vegetables, legumes, olive oil, and lean proteins—toward more processed, calorie-dense foods high in saturated fats and refined sugars [5]. This dietary transition, driven in part by globalization, urbanization, and the growing availability of fast food, has had a measurable impact on cardiovascular health. At the same time, physical inactivity is a growing concern. Urban living environments often lack safe, accessible public spaces for exercise, and cultural norms in some communities may limit outdoor movement, especially for older women [6]. These restrictions contribute to a sedentary lifestyle that compounds the risk of dyslipidemia.

Obesity—particularly central or abdominal obesity—is also highly prevalent among older Arab women and closely associated with unhealthy lipid levels, including high LDL-C and low HDL-C [7]. Factors such as limited physical activity, high-calorie diets, and postmenopausal hormonal changes make this condition more common and more difficult to reverse. In addition to these lifestyle factors, psychosocial stress plays an important, though less directly understood, role. Chronic stress caused by economic instability, social pressure, or the psychological burden of caregiving can alter how the body processes lipids. In many parts of the Arab world, this stress is further intensified by political conflict and insecurity. Countries such as Libya, Syria, and Yemen face ongoing instability, which not only disrupts healthcare access but also creates daily challenges around safety, food availability, and mental health. These broader societal issues must be considered when designing public health strategies, as they form the backdrop against which individual lifestyle choices are made.

Analysis Based on Evidence

For postmenopausal women, high LDL-C is a major heart risk. After age 50, LDL-C tends to rise due to slower metabolism, more inflammation, and lower estrogen [1]. In Arab countries, poor diets, low activity levels, and healthcare gaps make things worse.

Table 2. Aspects of LDL-C in women over 50

Aspect	Status in Women >50 (Arab region	References
Prevalence	Very high (30–76 %)	[1–3]
Causes	Post-menopausal biology; obesity; sedentary lifestyle; traditional diet	[2,4–6]
Gaps	Poor LDL-C control; under-treatment; adherence issues in women	[3,5,6]

From the above table (2) the data described that prevalence range of 30-76% which indicates major variability among Arabic countries. Other factors are related to increase LDL-C noticed in the table such as, obesity, lifestyle, traditional diet and others

Interventions and Recommendations

Medical Strategies

Statins help, but they're still underused --- especially in rural areas --- because of low health awareness and cost issues [3]. To close this gap, we need better patient education and programs that help people stick to their meds.

Lifestyle Approaches

As women age, especially after 50, their risk for high LDL cholesterol tends to increase, often due to hormonal changes after menopause. For women in Arab communities, addressing this issue through practical, culturally appropriate lifestyle changes can make a real difference. One of the most effective steps is shifting to a whole-food diet—one that focuses on fresh vegetables, fruits, whole grains, legumes, and healthy fats— while cutting back on foods high in saturated fat like fatty meats, fried snacks, and processed foods [5]. These changes don't have to be drastic or expensive; even small adjustments in daily meals can lead to healthier cholesterol levels over time.

Exercise is just as important, but it doesn't have to mean going to a gym. Many women benefit from simple, home-based workouts like stretching, walking in place, or following a short video online. These options are especially helpful for women who may have limited mobility or live in areas where outdoor activity isn’t always convenient or comfortable [6].

Another powerful tool is community education. Health workshops designed specifically for women—especially when held in familiar places like local clinics—can provide encouragement, build knowledge, and offer support. These gatherings give women a chance to ask questions, share experiences, and learn about practical ways to improve their heart health in a setting that respects their culture and lifestyle. Altogether, these approaches promote long-term, realistic habits that can help lower LDL cholesterol and improve overall well-being.

Future Research Directions

To close the gaps in lipid management for Arab women, future research must include them in clinical trials. They've long been underrepresented, which limits how useful current findings are [8, 9].

Menopause also brings major shifts in lipid levels --- like higher LDL-C and triglycerides --- which raise heart risks [9]. Studying these changes in Arab populations is key, since diet, culture, and genetics may shape how risks show up and how treatments work.

The use of mobile health (mHealth) tools also shows promise. These apps and platforms can lower LDL-C and help patients stick to medications and healthy habits [10]. But they need to be made for Arabic-speaking users and work well in rural areas to make a real difference.

Conclusion

High LDL-C in women over 50 --- especially in Arab countries --- is a serious health issue. Menopause, limited healthcare access, and cultural factors all add to the risk. To solve this, we need care plans that respect local culture, education campaigns that reach women where they are, and research that reflects their real-world needs. These steps can help lower heart risks and bring fairer care to women across the region. Also, this review shed the light about limited data found in Libya, this led to call future researched to increase studies about this topic and suggest recommendations.

Disclaimer

This article hasn't been published, presented, or used as part of a thesis.

Conflict of Interest

The authors have no conflicts --- financial, personal, or professional --- to declare.

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