

血脂异常流行现状及相关危险因素

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摘要

心血管疾病(CVD)是我国城乡居民死亡原因的首位, 血脂异常、高血压、高血糖、不健康生活方式、吸烟等危险因素的流行是其主要原因。其中血脂异常是动脉粥样硬化性心血管疾病(ASCVD)的致病性危险因素, 同时也是防止ASCVD及降低风险等级的重要干预靶点。由于经济的发展和 unhealthy 生活方式的流行, 我国血脂异常患病率呈不断上升趋势, 但知晓率、治疗率和控制率仍处于较低水平。因血脂水平升高导致的心血管事件也将持续增加。因此研究血脂异常的流行现状及相关危险因素, 采取有效的预防和治疗措施已成为重要的公共卫生问题。

关键词

血脂异常, 流行现状, 危险因素, 体力活动, 饮食模式

Prevalence and Influencing Risk Factors of Dyslipidemia

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Abstract

Cardiovascular disease (CVD) is the leading cause of death among urban and rural residents in China, which is mainly caused by the high prevalence of dyslipidemia, hypertension, hyperglycemia, unhealthy lifestyle, smoking and other risk factors. Dyslipidemia is a pathogenic risk factor for atherosclerotic cardiovascular disease (ASCVD), and it is also an important intervention target to prevent ASCVD and reduce the risk level. With the economic development and the prevalence of

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unhealthy lifestyles, the prevalence of dyslipidemia in China has been increasing, but the rates of awareness, treatment and control of dyslipidemia are still at a low level. Cardiovascular events caused by elevated lipid levels will also continue to increase. To analyze the prevalence of dyslipidemia and related risk factors, and to take effective prevention and treatment measures to reduce the prevalence of dyslipidemia have become an important public health issue.

Keywords

Dyslipidemia, Prevalence, Risk Factors, Physical Activity, Dietary Pattern

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1. 引言

心血管疾(Cardiovascular disease, CVD)病是我国最主要的死亡原因,其中动脉粥样硬化性心血管疾病(Atherosclerotic cardiovascular disease, ASCVD)的负担迅速增加是我国 CVD 流行病学的重要特征之一[1]。作为 ASCVD 可改变的危险因素,血脂异常在疾病的发生发展中发挥重要的作用。首先,血脂长期升高导致胆固醇侵入血管壁沉积,促进平滑肌细胞和成纤维细胞增殖,促进内膜炎症是 CVD 的起始,其中低密度脂蛋白胆固醇最为密切相关[2] [3] [4] [5]。其次,高甘油三酯水平和低高密度脂蛋白胆固醇水平的组合在糖尿病和代谢综合征患者中非常常见,这进一步增加了该人群发生 CVD 的风险[6] [7]。因此,定期检测血脂水平,尽早筛查中高危人群及相关危险因素,进行有效干预和治疗措施是减轻日益加重的 CVD 负担的关键措施。

2. 血脂异常及国内外流行现状

2.1. 血脂异常的定义

血脂异常通常是指血脂代谢紊乱引起的血清中胆固醇和(或)甘油三酯(Triglyceride, TG)水平升高,俗称高脂血症。以血浆总胆固醇(Total cholesterol, TC), TG, 低密度脂蛋白胆固醇(Low-density lipoprotein cholesterol, LDL-C)升高,高密度脂蛋白胆固醇(High-density lipoprotein cholesterol, HDL-C)降低为特征或这些特征的组合[8]。

2.2. 血脂异常的流行趋势

2.2.1. 血脂异常的全球流行趋势

1980 年至 2018 年期间,全球范围内血浆 TC 和非 HDL-C 水平未发现明显的变化。男性年龄标准化平均非 HDL-C 中位数,从 1980 年的 3.36 mmol/L 上升到 2018 年的 3.37 mmol/L。女性则从 1980 年的 3.44 mmol/L 略微下降到 2018 年的 3.34 mmol/L。这是由于过去高患病率的西欧和新加坡为代表的发达国家的患病率逐渐下降,随着经济的发展和生活方式的转变,东南亚、大洋洲为代表的发展中国家血脂异常患病率不断上升所致。西方国家非 HDL-C 水平的下降主要归因于以下两个方面:第一,降脂药物,特别是他汀类药物的广泛使用。第二,饮食结构的变化,即用不饱和脂肪替代食物中饱和脂肪以及反式脂肪酸。相反,动物源性食品和精制碳水化合物的摄入量大幅度增加,降脂类药物的使用量低是中低收入国家患病率上升的原因[6] [9] [10]。

尽管血脂异常患病率总体水平上的变化不明显,但其患病率仍然很高。2017年,全球范围内高非HDL-C导致的死亡约390万人[9],而到2019年血浆LDL-C水平升高所导致的死亡约440万[11]。LDL-C水平升高从1990年的第15大死亡风险因素,升到2007年的第11位,再上升到2019年的第八位[6]。因此血脂异常仍然是全球疾病预防和控制所面临的公共卫生挑战。

2.2.2. 血脂异常的国内流行趋势

过去四十年,我国非HDL-C水平大幅度增长,全球排名从第153位上升至第99位[6]。2002年全国营养调查报告的血脂异常患病率为18.6%,而到2014~2019年中国心血管疾病高危人群早期筛查与综合干预百万人群项目调查中患病率则上升至33.8% [12]。高TC、高LDL-C、低HDL-C和高TG患病率分别为6.9%、8.1%、20.4%和13.8% [13],呈不断上升趋势。但是,血脂异常的知晓率、治疗率和控制率仍然较低[14]。研究调查显示,中国35岁以上成人上述比例分别为16.1%,7.8%和4.0% [15]。并且,根据DYSIS-China研究结果,正在接受治疗的血脂异常患者中,血脂异常风险分层为高危和极高危的患者比例为96.6%,这提示我国不仅是血脂异常患病率高,血脂异常患者的总体风险也相当高[16]。由此可见,我国人群的血脂异常管理不容乐观。预测人群血胆固醇水平的升高导致的心血管事件在2010~2030年增加920万[17]。此外,与高TC和高LDL-C水平为特征的美国和欧美国家不同,高TG和低HDL-C是我国学血脂异常的主要特点[18]。因此,关注血脂异常治疗的首要降脂靶点LDL-C的同时,还应重视TG和HDL-C的管理,以更好地去控制我国血脂异常患病率及其相关CVD事件进一步增加。

3. 血脂异常相关因素

血脂异常是多种因素影响的结果,可以由遗传引起,也可以是系统性疾病、代谢状态的改变、不健康的生活方式(能量摄入过剩、体力活动不足、久坐行为)以及某些药物引起血清脂质及脂蛋白代谢的紊乱[6] [19] [20]。

3.1. 血脂异常与饮食

营养物质作为人体必需的能量来源参与机体所有的病理生理过程。高脂、高能量食物的过多摄入超过机体代谢水平,容易导致能量过剩。未被消耗的多余能量被储存,多余的碳水化合物以糖原的形式保存在骨骼肌和肝脏中,多余的脂肪酸形成三酰甘油,从而引起脂肪组织堆积和功能障碍[21] [22]。脂肪组织功能障碍进一步引起机体脂肪生成和代谢异常、胰岛素抵抗等,导致血脂异常、肥胖等疾病的发生[23] [24]。因此,减少总脂肪和饱和脂肪的摄入,减少胆固醇和单糖的摄入和适当摄入复合碳水化合物和蛋白质被认为是对血脂有益的饮食[25]。

研究结果显示,当饱和脂肪的能量减少10%,并用n-6所替代,可以使LDL-C降低0.5 mmol/l或约14%~15%。若10%的饱和脂肪被碳水化合物取代,LDL-C将下降0.3 mmol/l [26]。与此相反,也有研究表示碳水化合物特别是加工来源的碳水化合物的摄入量增加,可能会使TG水平和胰岛素抵抗相关的其他代谢综合征风险的增加[27]。而低碳水化合物饮食通过增加脂联素(一种脂肪细胞激素),促进胰岛素敏感性并防止动脉粥样硬化[28]。此外,通过补充omega-3和减少酒精或碳水化合物的摄入量来改善升高的TG水平[29]。因此,减少饱和脂肪的摄入的同时也要避免碳水化合物的过多摄入。

3.2. 血脂异常与体力活动

体力活动是指由骨骼肌收缩导致能量消耗的任何身体运动。世界卫生组织倡导每周进行至少150 min中等强度的有氧PA,或每周累积进行至少75 min高强度的有氧PA,或者中等和高强度两种活动相当量的组合,以降低慢性疾病的潜在风险促进健康及预防疾病[30]。体力活动对血脂的影响主要体现在以下几

个方面: 第一, 体力活动增加机体的新陈代谢, 从而加快脂肪的分解, 并且有助于消耗体内多余的热量, 避免其转变为脂肪。第二, 脂肪通过水解三酰甘油, β -氧化来为长时间的低强度运动提供能量。第三, 体力活动可以增加机体线粒体的密度, 为脂肪的 β -氧化制造有利的条件[22]。

一般来说, 体力活动的作用体现在 TG 的降低和 HDL-C 的升高, 而对 LDL-C 的影响存在争议[31]。研究发现, 经过有氧运动后, 虽然 LDL-C 水平没有显著降低, 但 LDL-C 颗粒体积增加并浓度有所下降。而与心血管事件相关的 LDL-C 亚组分是体积小, 密集的 LDL-C 颗粒[32] [33]。2019 年欧洲心脏病学会血脂指南中引用的数据也表明, 定期的体力活动对增加 HDL-C、降低总 TG 水平和影响 LDL-C 颗粒大小方面发挥作用[34]。此外, TG 与 HDL-C 的浓度比作为一种相对较新的脂蛋白指标, 可以作为心血管疾病的良好预测指标。在一项研究中发现, 经常锻炼并进行大量体力活动的非吸烟者在男性和女性中显示出最低的 TG/HDL-C 比率[35]。也有研究证明, HDL-C 对有氧运动的敏感性高于 LDL-C 和 TG。既不用药物也不采取饮食疗法的情况下, 有氧运动为 5.3 MET 时, HDL-C 增加 2.53 mg/dL, 而 HDL-C 为已知的心血管保护因素[36]。

3.3. 血脂 s 异常与久坐行为

久坐行为被定义为“任何以坐姿或斜躺姿势时能量消耗 ≤ 1.5 METs 为特征的清醒行为”, 已被确定为全因死亡和各种慢性疾病的危险因素[37]。独立于体力活动, 久坐行为与较高的 TG、血压、血糖、腰围以及较低的 HDL-C 等相关。而且, 与任何其他危险因素相比, 对 TG 产生的影响更为明显[38]。首先久坐不动与较低的静息代谢率有关, 这会导致能量消耗的降低[39]。其次, 静息状态时, 脂蛋白脂肪酶(一种在脂质代谢中起关键作用的蛋白质)会减少, 从而影响脂肪的代谢过程[40]。

久坐行为一般是指坐着或看电视的时间。而看电视通常发生在晚餐后, 因此餐后久坐时间的延长对葡萄糖和脂肪代谢产生不利影响, 容易引起脂肪堆积和肥胖。另外一种可能的解释是看电视通常伴随着吃零食的行为, 食品广告也会部分影响饮食行为, 富含糖和脂肪的零食的过多摄入会进一步引起脂代谢的紊乱[41] [42] [43]。

3.4 血脂异常与吸烟

吸烟是全球公认的冠状动脉粥样硬化性疾病的危险因素之一, 长期吸烟通过多种机制促进动脉硬化的发展。吸烟对疾病的影响主要归因于引起脂代谢紊乱和促进血管炎症反应[44]。具体而言, 烟草烟雾暴露与较高的 LDL-C、TG 以及较低的 HDL-C 相关[45]。肝细胞表面表达的 LDL 受体蛋白在血液中 LDL-C 水平的调节中起重要作用。目前的研究结果证明, 吸烟引起的脂代谢紊乱, LDL-C 水平的升高, 可能与吸烟导致的 LDL 受体蛋白的水平降低有关[46]。此外, 尼古丁刺激儿茶酚胺类、皮质醇和生长激素的分泌, 导致游离脂肪酸的浓度增加, 进一步导致 LDL-C 和 TG 的升高[47]。而吸烟改变血清脂质的机制仍有待进一步研究。

3.5. 血脂异常与药物及疾病

药物可以引起继发性血脂异常, 如糖皮质激素、雌激素、维甲酸、环孢素、抗抑郁药物、血管内皮生长因子抑制剂和芳香化酶抑制剂等。此外, 一些影响代谢状态的系统性或代谢性疾病也可以引起血脂异常。主要有肥胖、糖尿病、肾病综合征、甲状腺功能减退症、肾功能衰竭、肝脏疾病、系统性红斑狼疮、糖原累积症、骨髓瘤、脂肪萎缩症、急性卟啉病、多囊卵巢综合征等[8]。肥胖与血脂异常密切相关, 这与肥胖导致的脂肪组织功能障碍引起机体脂肪生成和代谢异常、胰岛素抵抗等有关[24]。与之相同, 糖尿病患者存在的胰岛素抵抗与更小、更致密的 LDL 颗粒和升高的 TG 相关[48]。此外, 甲状腺功能减退

是影响血脂代谢最常见、最重要的疾病。这是由于甲减时肝脏 LDLR 表达下降和胆固醇 7- α 羟化酶活性降低所致[49]。也有研究提示, 维生素 D 的缺乏与血脂代谢紊乱有关, 其中原理可能是与 2-羟维生素 D (一种脂溶性维生素)可增加脂肪细胞钙离子水平, 从而增加脂肪酸合成酶活性, 抑制脂肪分解的作用降低有关[50]。

4. 讨论

近年来, 我国血脂异常患病率不断升高。经济的发展, 生活水平的提高带来的体力活动不足及高糖高热量饮食为特征的不健康生活方式的流行是其主要的的原因之一。但是, 血脂异常的知晓率、治疗率以及控制率低, 血脂异常防控形势仍比较严峻。由于血脂异常明显受生活方式的影响, 因此健康的生活方式包括饮食改变即减少碳水化合物及脂肪的摄入、参加指南推荐量的体力活动、戒烟、保持理想体重是预防及治疗血脂异常的基础措施。非药物治疗效果不明显或中至高危 ASCVD 人群, 则加用降脂药物, 及时有效调脂、定期检测血脂, 必要时增加药物剂量或联合用药, 降低 ASCVD 发病风险, 且必须长时间坚持才能有效控制血脂水平。

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