

久坐的健康危害与运动干预的研究进展

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摘要:科技的发展使人们的工作和生活方式发生了明显改变,久坐人群越来越多。久坐行为严重影响人体健康,可导致心血管机能失调、代谢紊乱等慢性疾病,同时可能影响人的心理健康。该文对久坐行为、人体健康、身体活动及三者间的相互作用进行了系统的分析,阐述身体活动强度和量度在久坐所致人体身心健康状态中发挥的作用,旨在为基于运动锻炼的久坐人群健康干预提供新的思路。结果表明:久坐行为与人体心血管疾病、代谢疾病甚至某些癌症都有较高的相关性,久坐或较少的身体活动对人的心理及情绪亦可产生负面影响;运动可改善久坐人群的健康状况,干预效果随运动负荷的增加而增加,高强度间歇运动锻炼可更有效地改善久坐对人体的不良影响。

关键词:久坐 心血管疾病 代谢疾病 抑郁症 身体活动

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Research on Sedentary Health Risk and Exercise Intervention

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Abstract: The development of science and technology has led to significant changes in human work and lifestyle, and there are more sedentary people. Sedentary behavior seriously affects human health, can lead to cardiovascular dysfunction, metabolic disorder and other chronic diseases, and may affect people's mental health. This paper systematically analyzes sedentary behavior, human health, physical activity and the interaction among them, and expounds the role of physical activity intensity and measurement in human physical and mental health caused by sedentary, aiming to provide a new idea for health intervention of sedentary population based on exercise. The results showed that sedentary behavior has a high correlation with cardiovascular diseases, metabolic diseases and even some cancers. Sedentary behavior or less physical activity can also have negative effects on people's psychology and emotion. Exercise can improve the health status of sedentary people, and the intervention effect increases with the increase of exercise load. High-intensity intermittent exercise can improve the adverse effects of sedentary people more effectively.

Key Words: Sedentary behavior; Cardiovascular disease; Metabolic syndrome; Depression; Physical activity

科技的发展导致人们对电脑和手机的依赖越来越高,人们的生活方式也随之发生很大改变。每天足不出户即可完成很多事情,从而导致久坐的时间越来越长。日常活动量的减少和久坐给人们的身体带来了很大影响,因此近年来大量人口健康调查开始使用各种

评估方法来研究久坐行为。研究发现,1960年成年人平均久坐时长为4.3h/d,而2005年已达到6h/d,2011年成年人平均久坐时长6~8h/d,60岁以上的成年人平均久坐时长高达8.5h/d^[1]。2020年的健康调查发现,大学生的久坐时长已高达9h/d^[2]。

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1 久坐的定义与测量

1.1 久坐行为的定义

久坐行为是指以坐姿或斜躺姿势进行的能量消耗小于等于1.5代谢当量的任何清醒行为^[3]。常见的久坐行为包括观看电视、使用计算机、用手机看视频、打电子游戏、驾驶和阅读等。而身体活动不足主要指少量或达不到指南推荐量的身体活动,即被定义每周不满足150min的中等强度身体活动或75min的高强度身体活动^[4]。因此,相关学者在研究达不到中高强度身体活动量、身体活动不足和久坐行为时常将它们视为具有独立决定因素和健康影响的不同概念。

1.2 久坐行为的测量

久坐的测量包括问卷量表、视觉录像观察、间接量热法、动态心电图、心率监控、加速度计等^[5]。问卷量表成本低且相对容易操作,通过填写量表的方式来估算久坐行为的时长,常用的量表包括身体活动量表(Physical Activity Questionnaire)、职业坐姿与身体活动量表(Occupational Sitting and Physical Activity Questionnaire)等。视觉观察或者录像的方式作为经典测量方式是对测试人员进行视觉观察全程录像,适用于受试者活动空间单一且有身体姿态要求的场景。间接量热法,通过测量氧气和二氧化碳的消耗率用公式推断久坐行为的时长,需使用测量氧耗的仪器,不适用于大范围的流行病学调查和脱离实验室的研究。动态心电图法,通过心功能的线性变化来推导出能量消耗,主要用来监测心脏病患者,运动可能造成电极接触不良等情况的出现。心率监控法,包括光电心率或者电信号胸带的检测方法,通过光电心率测量心率时在多个混杂因素同时存在时,准确率较低。加速度计法,在人的手腕脚踝或者大腿绑上传感器来测试是否有运动或者久坐行为,能较准确区分出身体活动和运动强度,可广泛应用于各类人群^[6]。

2 久坐对人体健康的危害

2.1 久坐与下背部疼痛

下背部疼痛是最为常见的慢性病,严重影响患者的正常工作和生活,甚至会对患者的心理产生影响^[7]。有研究认为,久坐时间的增加和下背部疼痛有着相关性,久坐时间越长,越容易出现下背部疼痛的问题^[8]。但有更多的研究表明,运动锻炼行为相比久坐时长与下背部疼痛的相关性更大^[9]。一项针对青少年的研究表明,女孩比男孩更容易产生下背痛,但是与久坐时间无关,可能与其肌肉力量较弱有关^[10]。可见,久坐可能

不是导致下背部疼痛的主要因素,但是在运动锻炼不足、相关肌群力量不足的情况下,久坐行为将成为下背部疼痛的诱因,且随着久坐时间的延长,下背部疼痛的风险显著增加。

2.2 久坐与心血管健康

久坐虽然不是人体心血管健康的决定性因素,但是久坐在一定程度上会提高心血管疾病的发病率和死亡率,但久坐多久能引起这样的关联需要进一步研究证实^[11]。研究指出,久坐对心血管疾病有不利影响,减少久坐行为比仅增加活动量对人体健康更有效^[12]。一项青少年心血管健康调查结果显示,女性心血管健康和锻炼相关,与久坐关系不大,但久坐时间对男性心血管健康有着很大的影响^[13]。减少久坐行为能减小颈动脉内膜中层厚度,而颈动脉内膜中层厚度是早期动脉粥样硬化的标志^[14]。久坐时间较长的驾驶员比久坐时间较短者患致命性心血管疾病高84%^[15]。久坐与心血管健康密切相关,长期久坐行为会对人体心肺功能和血管的健康产生不利影响。

2.3 久坐与代谢综合征

代谢综合征是指人体的蛋白质、脂肪、碳水化合物等物质发生代谢紊乱的病理状态。长期患有代谢综合征的人患糖尿病、冠心病、向心性肥胖、静脉循环障碍、充血性心力衰竭、骨关节病、癌症等疾病的风险增加^[16]。久坐和代谢综合征呈正相关,轻度和中度的身体活动无法抵消久坐的不良效应,只有高强度的体育运动才能有效减弱这一关联^[17]。即使人们达到建议的周活动指标,但是随着久坐时间的增加,还是会加大患代谢综合征的风险^[18]。久坐时间每人每周大于42h会提高4%~12%患代谢综合征、向心性肥胖和高甘油三酸酯以及女性高血压的风险^[19]。

2.4 久坐与抑郁症

抑郁症是最普遍的精神障碍之一,而久坐和抑郁症密切相关,久坐行为还可能是抑郁症自我伤害的指标之一^[20]。研究显示,久坐和其他慢性疾病以及抑郁症有很大的关联性,但是不同年龄层面的关联性可能有所差异^[21]。针对成年人的研究发现,久坐和抑郁症有相关性,但是这种相关可能也与身体活动减少有关^[22]。针对青少年的研究发现,久坐少动的青少年比其他青少年更容易出现抑郁症、自我伤害等行为^[23]。针对老年人群的研究发现,久坐和抑郁症有高度关联性,久坐行为的老年人更容易患上抑郁症^[24]。

2.5 久坐的其他健康风险

久坐行为与二型糖尿、超重肥胖以及高血压均有着密不可分的关系^[25]。美国心脏协会的研究报告指出,久坐观看电视增加2h,患二型糖尿病的概率增加14%,并且一项长期跟踪调查显示,久坐时间和人们的死亡率显著相关^[26]。英国的一项调查结果显示,每天久坐6~8h或者看电视3~4h患二型糖尿病的风险会大大增加,8%的致死人口和24%二型糖尿病患者都和久坐行为有关^[27]。加拿大一项研究指出,每天久坐时间过长的女性比没有久坐行为的女性患子宫内膜癌、乳腺癌和卵巢癌的风险增加了33%、8%和40%^[11]。还有研究指出,每日久坐超过10h的人和高尿酸症有很强的关联性^[28]。

3 久坐行为与身体活动的相互作用

3.1 身体活动对在久坐危害的影响

身体活动与健康密不可分,久坐时间较长并且身体活动偏低的人群更容易患上各类慢性疾病。研究认为,中高强度身体活动能减小久坐带来的危害,但是低强度运动的效果相当有限,心血管疾病以及代谢问题可能和运动量不足关系密切^[29]。在久坐时间相近情况下,低负荷身体活动者发生心血管疾病的概率较大,而中、高负荷身体活动组心血管疾病发生率较小^[30]。研究发现,活动强度越大越能抵消人们患代谢综合征的风险,同时中高强度的锻炼能增加肌肉力量,加强心血管功能,而低强度的运动没有这种功效^[31]。久坐与低密度脂蛋白的升高呈正相关,而久坐人群进行中高强度的体育锻炼也能降低其低密度脂蛋白水平^[32]。减少久坐并且增加身体活动能明显改善糖尿病、超重以及心血管疾病的发生^[33]。高强度运动可显著减弱久坐带来的癌症以及心血管疾病的危害,还能减弱久坐带来的高尿酸等症状^[34,35]。另外,高强度的锻炼和良好的睡眠能降低因为久坐带来的抑郁症等精神疾病的风险,充足的身体活动可显著降低久坐青少年的自杀风险^[17,30]。

3.2 高强度间歇运动锻炼对久坐的干预

一项研究对45名中年男性分别采用高强度短间歇(High intensity interval training, HIIT)和中等间歇中等强度的训练,对照组为不运动久坐人群,分别观测其最大摄氧量、炎症反应蛋白指标以及肿瘤坏死因子,两组的最大摄氧量提升都很明显,但是只有HIIT组腰围下降明显,而其他两项指标实验组和对照组相比变化不大^[36]。一项针对年轻久坐女性的6周实验表明,HIIT训练能明显改善其心血管功能^[37]。同时,有研究

表明,高负荷量的训练相比于低负荷量的训练对骨密度的提升更大^[38]。在一项对久坐女性的干预研究中发现,运动对年轻女性的肌肉力量、体脂率和生活质量都有很大的帮助^[39]。研究发现,高强度的运动比中低强度的运动锻炼,可更为有效地改善衰老潜在指标白细胞端粒长度^[40]。

4 结语

久坐对人体生理和心理健康均可产生不良影响。久坐行为虽然不是导致下背部疼痛、心血管疾病、代谢综合征等慢性疾病的决定性因素,但久坐行为作为诱因可显著增加以上相关慢性疾病的患病风险。此外,久坐行为与抑郁症密切相关,长期久坐以及身体活动不足会对情绪产生不利影响,从而导致一系列心理问题,心理疾病严重者甚至会发展为抑郁症。久坐对于中老年人情绪及健康会具有较大影响。中高强度的锻炼能有效减少久坐带来的危害,而高强度间歇性运动锻炼可能是更为有效的干预措施。

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