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Original Research Paper

Health Science

"A COMPREHENSIVE REVIEW OF HOW LIFESTYLE CHANGES AFFECT HEART HEALTH"

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ABSTRACT

This study explores the dramatic impact of lifestyle on your cardiovascular system, highlighting both the detrimental effects of unhealthy habits and the potent benefits of a heart-healthy lifestyle. Cigarette smoke acts like a slow-motion poison to your heart. It damages blood vessel walls, promoting plaque build-up and narrowing arteries. This not only hinders blood flow but also increases the risk of blood clots, potentially leading to heart attacks or strokes. Similarly, a diet laden with unhealthy fats, processed foods, and excessive sugar disrupts your body's delicate metabolic balance. This can elevate blood pressure, cholesterol levels, and blood sugar, further burdening your cardiovascular system. Regular exercise emerges as a superhero in this fight. Physical activity strengthens your heart muscle, improves blood flow, and enhances your body's ability to manage blood sugar and cholesterol. Diet transformation is another powerful tool. Embrace a heart-healthy diet rich in fruits, vegetables, whole grains, lean protein, and healthy fats. Quality sleep is often an overlooked yet crucial factor. When you're sleep-deprived, your body releases stress hormones that can elevate blood pressure and heart rate. Aim for 7-8 hours of restful sleep each night to allow your body to repair and recharge, promoting cardiovascular health. Chronic stress is another villain to conquer. Stress hormones wreak havoc on your cardiovascular system, increasing blood pressure and inflammation.

KEYWORDS : Life style. Cardiovascular Disease, Myocardial Infraction, Plaques, Transformation.

INTRODUCTION

The world's biggest cause of mortality and disability is cardiovascular complaint (CVD).[1] The two most significant CVDs, ischemic heart (IHD) and stroke, reckoned for over 85 of all CVD- related losses in 2015 (GBD 2015 Mortality and Causes of Death Collaborators, 2016). Encyclopedically, 18.6 million people failed from CVD in 2019 and 34.4 million times were spent impaired.[2] coincidently, the global health burden is increased by life and diet- related cardio metabolic diseases as rotundity, type 2 diabetes mellitus, coronary heart complaint (CHD), and stroke. Salutary threat and life factors also affect other vascular diseases similar as atrial fibrillation, habitual renal complaint, supplemental arterial complaint, and cognitive decline.[3] Unhealthy life actions and unbridled threat factors regard for roughly 80 of IHD (Centers for Disease Control and Prevention (CDC), 2013. The CDC estimated that nearly one fourth of all deaths due to the CVDs could be averted each time, through the changes in life habits and the operation of threat factors. That's why to address the difference in CVD issues, substantiation- grounded primary forestallment strategies are demanded. According to current guidelines, people who are asymptomatic should be screened for CVD threat, and those who are at high threat of incident CVD should begin threat mitigation treatments.[4, 5] life variations including exercise and eating a balanced diet are important for the primary forestallment of cardiovascular complaint(CVD) There's a substantial scientific substantiation showing that life interventions and threat factor revision are important in primary and secondary forestallment and that they can reduce cardiovascular morbidity and mortality and are effective in controlling a number of CVD threat factors, similar as rotundity, dyslipidemia, and hypertension. Four major professional associations have released guidelines for the forestallment of cardiovascular complaint (CVD) in the once couple of times. These associations include the World Health Organization, American Heart Association, American College of Cardiology, and European Society of Cardiology. The guidelines recommend screening for CVD and customizing preventative interventions grounded on absolute threat criteria rather of the conventional focus on individual threatfactors.[6- 8] To estimate the absolute CVD threat, colorful threat assessment algorithms are used to cipher absolute CVD risk similar as Framingham Risk Score, Reynolds Risk Score, and Pooled Cohort Equations Methodical Coronary threat Evaluation etc. A few important lessons have become clear. First, various cardio metabolic risk factors, such as low-density lipoprotein (LDL) cholesterol and obesity, blood pressure (BP), glucose-insulin homeostasis, lipoprotein concentrations and function, oxidative stress, inflammation, endothelial health, hepatic function, adipocyte metabolism, cardiac function, metabolic expenditure, pathways of weight regulation, visceral adiposity, and the micro biome are now clearly influenced by dietary habits. Although blood cholesterol and dietary fat accounted for decades of dietary advice, and while obesity and total calories are frequently discussed in nutritional discussions, the overall impact of diet on health goes much beyond these parameters. Cardio metabolic consequences of any nutrient, food, or overall diet should not be extrapolated from any single surrogate outcome [9]by adaptation of yoga in lifestyle it will reduce the risk of cardiovascular disease by improving mental health. An improved quality of sleep also reduce the risk of CVDs[10]. Lifestyle modifications serve as crucial preventive measures for CVDs Changes in lifestyle can lessen the need for medicine or increase its efficacy. Lifestyle changes are crucial to the management of cardiovascular disease (CVD) in those who have already received a diagnosis, as they enhance quality of life and improve outcomes.

BACKGROUND

As far as we aware that for a healthy life we will have to make our heart healthy which can be achieved by making modification and adapting good changes in day to day life A healthy life style plays an important role in maintaining optimum heart health status. It will reduce the chances of CVDs. Risk factors associated with CVDs are modifiable and can be influenced through lifestyle modifications by adopting all these points in day to day life such as Smoking cessation, Regular daily exercise, Healthy diet, maintain healthy weight, Sound sleep, and by Managing stress. Our study will tell us how all above points influence the health of our heart.

Review of literature

Impact of smoking on Heart's health

Ten percent of CVDs are caused by smoking, according to data from the World Health Organization. Approximately 6 million people worldwide pass away from smoking-related causes each year. Epidemiologic studies have supported the assumption that cigarette smoking increases the incidence of myocardial infarction and fatal coronary artery diseases.[12] Smoking raises the risk of acute myocardial infarction (AMI),

stroke, peripheral artery disease, aortic aneurysm, and sudden death. It is also directly connected to early onset atherosclerosis, which begins in teenagers and young adults.[11,12,13] Regarding secondhand smoke, a number of its constituents—such as particulate matter and carbonyls—have shown significant harmful effects on the cardiovascular system.[14] Tobacco smoking is now considered a "strong, independent risk factor for CVD events and premature death" according to the 2019 ACC/AHA Prevention Guidelines.[15,16] The National Health Interview Survey indicated that smoking contributed to the development of ASCVD in young people.[17-20] Cigarette smoke is thought to include around 7,000 chemical components from various groups, at least 72 of which are known carcinogens. Attempts were made in 2003 to connect chemical compounds to toxicity and to investigate the risk of chronic illness. They linked the danger of cancer to 1, 3-butadiene, and the risk of cardiovascular disease to cyanide, arsenic, and cresols.[21] Bernhard and associates demonstrated the critical function that metals in cigarette smoke play in harming the vascular endothelium.[21, 22] Indeed, Johnson noted a notable reversal of FMD after quitting smoking for a year.[23] Additionally, secondhand smoke has a detrimental impact on FMD, but this effect can be mitigated one year following exposure. [24] The Surgeon General's report from 2004 identified six pathogenetic mechanisms of smoking-induced heart disease: decreased myocardial blood and oxygen supply, increased myocardial oxygen and blood demand, prothrombotic effect, inflammation, IV, abnormal lipid metabolism, and I. Endothelial damage.[25]

Nicotine acetylcholine receptors (nAChRs), which are found in the Central Nervous System and other organs that are a part of the parasympathetic autonomic nervous system, appear to be stimulated in order to produce the effects of nicotine. The adrenergic effects of nicotine, which raise heart rate, inotropic status, coronary micro vascular resistance, and insulin sensitivity, appear to be linked to an increased risk of cardiovascular disease.[26] Smokers had greater central systolic blood pressure and pulse pressure than nonsmokers, suggesting that central blood pressure is primarily affected.[27] Because smoking causes lipid oxidation, oxidatively damaged low-density lipoproteins (LDLs) are engulfed by macrophages that develop into foam cells, which starts the plaque development process.[28,29]

Smoking cessation and heart health

Quitting smoking can help reduce excess risk, even in older persons.[30] In order to evaluate the relationship between the number of years since quitting smoking and the incidence of CVD, Duncan et al. conducted a retrospective analysis of prospectively acquired data from the Framingham Heart Study population, which comprised people without CVD at baseline and followed up until December 2015. The study population consisted of 8, 770 people (3,805 from the first cohort, evaluated four times between 1954 and 1958, and 4,965 from the offspring cohort, investigated once between 1971 and 1975). The benefits of quitting smoking for cardiovascular health have been shown in other research. Heavy smokers (≥20 pack-years) who discontinued within 5 years had a considerably lower risk of CVD (hazard ratio 0.61) compared to current heavy smokers. The study also showed that the risk of CVD decreased over time, but very gradually. Former heavy smokers were statistically associated with a higher risk of CVD until 10 to 15 years after stopping (5–10 years in the first recruited cohort and ≥25 years in the offspring cohort). This difference was observed between them and never smokers. Within 10 to 15 years of quitting, the additional CVD risk among former smokers with <20 pack-years ceased to be significant when compared to never smokers. This result highlights how important it is to stratify the risk based on total pack-years to avoid underestimating the risk in those who were heavy smokers but stopped five years ago.[31] In a relatively recent paper, Delgado looked at the effects of smoking and quitting on endothelial function indicators and their relationship to mortality.[32] The goal of the study was to look at how smoking affected blood indicators of endothelial dysfunction and see if this would have an impact on how useful the markers would be for predicting cardiovascular risk. Higher concentrations of soluble Intercellular Adhesion Molecule-1 (sICAM-1), soluble Vascular Cell Adhesion Molecule-1 (sVCAM-1), sL-selectin expressed on leukocytes, and sE-selectin expressed by endothelial cells and leukocytes, as well as sP-selectin expressed by endothelial cells, were found in the research smokers. Levels of sL-selectin were reduced and inversely correlated with mortality in smokers who were still in active mode even after 20 years of quitting, which improved risk prediction.

Impact of exercise on Heart's health

The cardiovascular system has been demonstrated to benefit from regular exercise. Exercise improves blood lipid profiles, decreases blood pressure, and increases insulin sensitivity.[33–35] Frequent physical activity is linked to improved functional capacity and a slight decrease in hospitalization and all-cause death in heart failure patients.[36] Exercise is also thought to have antidepressant properties, improve confidence, and build endurance.[37] Exercise is a highly effective means of managing cytokine activity linked to inflammation, which is a major factor in the heart remodeling associated with AMI. Exercise has been shown to reduce levels of pro-inflammatory cytokines such as C-reactive protein (CRP), IL-1, IL-6, and INF- and to increase levels of anti-inflammatory cytokines such as IL-10. Both the coronary risk profiles and inflammation are improved.[38] Through the down regulation of the fibrosis-related factor TGF- , exercise can also lower the size and fibrosis of myocardial infarcts.[39] Exercise decreases apoptosis and enhances cardiac function via increasing AKT expression, phosphorylating AKT, and phosphorylating glycogen synthase kinase (GSK)-3 . Treatment with PI3K kinase inhibitors abolished the beneficial effects of exercise, providing mechanistic insights into the effects of exercise on heart apoptosis and function.[40] Diabetic cardiomyopathy is a major source of morbidity and death in the diabetic population due to its combination of anatomical, morphological, functional, and metabolic issues in the heart. Recent research has shown that exercise can protect against DCM, especially in type II diabetes.[41] Numerous studies suggest that exercise can enhance cardiovascular health in both aging animals and older people.[42]

Impact of Diet on Heart's health

Omega-3 fatty acids may lessen the risk of CHD by lowering blood triglyceride levels, improving endothelial dysfunction, and reducing ventricular arrhythmia.[43] ALA may help prevent congestive heart disease since it can be transformed by humans into EPA and DHA. Omega-3 fatty acids, such as ALA, are plentiful in canola, soybean, and flaxseed oils.[44] Meals with a high content of viscose soluble fiber, such as barley, oats, and rye, and meals with less starch gelatinization, such as spaghetti and oatmeal, usually digest more slowly and have lower GI values. Larger studies are needed, however in several controlled clinical trials, giving diabetes patients low-GI meals greatly improved their glycemic control and lipid profile.[45] A decreased risk of CHD was linked to increased diets of fruits, vegetables, legumes, whole grains, poultry, and seafood.[46]

Effect of Improper sleep on heart health

Sleeping with noise may cause an increase in body movements, heart rate, blood pressure, and finger pulse amplitude.[47] Insufficient sleep is linked to elevated sympathetic activity, which raises heart rate and blood pressure.[47] People who struggle with environmental noise

during the night often wake up tired and sleepy, and they also tend to get irritated, moody, feel less well, and have difficulties with hypertension and cognitive function.[48] The incidence and mortality of diabetes, hypertension, stroke, and coronary heart disease in the elderly have all been related to exposure to traffic noise, even throughout the day.[49] Inadequate sleep may act as a mediator between a higher risk of cardiovascular morbidity and nighttime noise pollution through altered endocrine and metabolic systems.[50] There is growing evidence that extended exposure to noise pollution is detrimental to one's health, and sleep problems are unquestionably linked to a loss in health. Thus, it follows that adequate sleep is essential for heart health.

Impact of Noise on Sleep Quality:

Above studies shows, noise exposure during sleep not only disrupts the sleep cycle but also contributes to increased sympathetic activity, leading to heightened blood pressure and heart rate. Individuals who experience disturbances in sleep due to environmental noise often report daytime fatigue, irritability, and impaired cognitive function, which can further affect overall well-being.

Associations with Cardiovascular Disease:

Above these Studies have demonstrated a clear link between noise pollution, particularly from sources like traffic, and an increased risk of cardiovascular diseases such as hypertension, stroke, and coronary heart disease. Continuous exposure to noise pollution can exacerbate cardiovascular morbidity through various pathways, including disruptions in endocrine and metabolic functions.

So Quality sleep is essential for maintaining optimal heart health. Environmental noise disturbances during sleep can lead to various cardiovascular complications, emphasizing the importance of creating conducive sleep environments. By prioritizing sound sleep and minimizing exposure to noise pollution, individuals can take proactive steps to safeguard their heart health and overall well-being.

Impact of Stress on Heart's health

Research describing the impact of long-term stressors on cardiovascular disease are probably more epidemiological than pathophysiological in character. Typically, they address issues like divorce, job stress, or feelings of unfair treatment. But there's growing interest in persistent daily problems that lower one's mood and could be harmful to one's health. These minor annoyances that nag at you every day are definitely not good for morale. Chronic problems are also linked to poor health habits, including smoking and exercise [51], as well as higher levels of procoagulant and inflammatory markers.[52] This study on daily micro-stressors is likely to be a subject of more future research, even if the majority of chronic stressor research focuses on more severe stressors. BP during a conflict is examined in the paradigmatic research of chronic stresses. As an illustration, BP spiked significantly during the Leningrad siege. The fact that the starving conditions and the siege's impact lingered long into the future is what is most astounding. Relative to Russians who had not been in the besieged city, survivors of the Leningrad siege even fifty years later had higher blood pressure and a higher death rate from cardiovascular disease.[53] "High stress" occupations are extremely demanding and provide the person very little control. A further model for occupational stress takes into account effort-reward imbalance, or the discrepancy between high labor efforts and low compensation. Numerous epidemiologic research point to a higher risk of cardiovascular disease for those who work in such high-stress environments.[54] Men who reported a mismatch between effort and reward at work had a 2.15-fold greater risk for developing coronary heart disease, according to the Whitehall II research.[55] When monitored for six years, the researchers discovered that stressed-out carers were more likely to experience hypertension.[56]

Overall, the interpretation of the content underscores the multifaceted relationship between stress and heart health. Chronic stressors, daily micro-stressors, acute stress responses, and occupational stress all contribute to the development and exacerbation of cardiovascular diseases. Understanding and managing stress effectively are essential components of promoting heart health and reducing the risk of cardiovascular complications.

The most recent suggestions and instructions for changing one's lifestyle to improve cardiovascular health

- Fruits, vegetables, whole grains, lean meats, and low-fat dairy products are the mainstays of the American Heart Association's heart-healthy diet recommendation. It promotes reducing added sugars, salt, and saturated and Trans fats.[57]
- The American Heart Association (AHA) suggests engaging in muscle-strengthening activities at least twice a week in addition to 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity per week.[57]
- The American Heart Association (AHA) is a big proponent of quitting smoking and supports comprehensive initiatives to help people quit.[57]
- The cornerstone of CVD prevention, according to the ESC guidelines, is a changed way of living. These consist of managing weight, quitting smoking, maintaining a healthy diet, and getting regular exercise.
- The World Health Organization advises engaging in muscle-strengthening activities in addition to 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity per week.
- The WHO promotes comprehensive tobacco control laws that include quitting assistance, smoke-free workplaces, and tobacco taxation.
- A balanced diet including a range of fruits, vegetables, whole grains, lean proteins, and healthy fats is advised by the World Health Organization. It suggests consuming less salt, saturated and trans fats, and free sugars.[58]

CONCLUSION

All the above studies suggest us that lifestyle modifications have shown significant positive impacts on heart health. By adopting healthier habits such as regular exercise, maintaining a balanced diet rich in fruits and vegetables, avoiding tobacco and excessive alcohol consumption, and managing stress effectively, individuals can lower their risk of developing cardiovascular diseases. These lifestyle changes not only improve overall physical well-being but also contribute to better heart function, reduced cholesterol levels, normalized blood pressure, and decreased risk of obesity. Embracing a heart-healthy lifestyle not only enhances longevity but also fosters a higher quality of life. Therefore, prioritizing these modifications can greatly improve heart health outcomes and overall well-being.

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