



A REVIEW ARTICLE ON CARDIOVASCULAR DISEASE RISK PREDICTION IN YOUNGER ADULTS

Siddhartha Lolla*, Anguru Yamini Krishnaveni, Kurra Ushasri and Shaik Nayeem Uddin

Department of Pharmacy Practice, Pulla Reddy Institute of Pharmacy, Jawarharlal Nehru Technological University, Dundigal, Hyderabad, Telangana, India, 500055.



*Corresponding Author: Siddhartha Lolla

Department of Pharmacy Practice, Pulla Reddy Institute of Pharmacy, Jawarharlal Nehru Technological University, Dundigal, Hyderabad, Telangana, India, 500055.

Article Received on 23/11/2023

Article Revised on 13/12/2023

Article Accepted on 02/01/2024

ABSTRACT

Cardiovascular Disease and its risk factors. It's true that unhealthy lifestyles and habits can contribute to the development of cardiovascular disease. Lifestyle factors like diet, exercise, and smoking play a major role in increasing the risk of CVD, even in young adults. Consuming a poor diet high in saturated and trans fats, sodium, and added sugars can lead to high blood pressure, obesity, and high cholesterol levels, all of which are major risk factors for CVD. Additionally, leading a sedentary lifestyle and not engaging in regular exercise can also contribute to weight gain, high blood pressure, and unfavorable changes in blood lipid profiles. And of course, smoking or using tobacco products is a major risk factor for CVD as well. It's important for everyone, especially young adults, to make healthy lifestyle choices to reduce their risk of cardiovascular disease.

KEYWORDS: Cardiovascular Disease, Smoking, Obesity, Alcohol, Tobacco.

INTRODUCTION

Cardiovascular disease is the one of the most common risk factors among the adults since a period of time. Globally, there is substantial evidence that modifiable risk factors for CVD are increasing in adolescents. Most of these risk factors are caused by unhealthy lifestyles and habits. Adolescents and young adults are particularly susceptible to these.^[1] Most of the cardiovascular diseases are addressed by the unhealthy habits such as tobacco, smoking, alcohol and unhealthy food. Detecting the cardiovascular diseases at an early stage is one of the most important task to prevent the further risk. Young adults 18 -25 years of age are highly prone to cardiovascular disease. CVD accounts for 1.76 million deaths globally, which is an increase of 14.5% from 2016.^[2] One of the three cardiovascular risk factors 1. Hypertension 2. Hyperlipidemia 3. Smoking. In addition to this most of the young adults are unaware of the CVD.

LIFESTYLE

Lifestyle plays a major role in the most of the diseases. The behavioral factors such as tobacco and alcohol consumption as well as sedentary lifestyles and other factors that exhibits complex interdependencies with these behavioral factors such as obesity and hypertension.^[3] Lifestyle factors in young adults including diet, exercise and smoking also impact CVD risk both directly and indirectly. Unfortunately, the prevalence of CVD risk factors continuous to rise,

including in younger adults, along with rates of myocardial infraction and heart failure.^[4] Unhealthy lifestyle choices can contribute to various risk factors for CVD, including.

1: Poor Diet: Consuming a diet high in saturated and trans fats, cholesterol, sodium and added sugars increases the risk of developing high blood pressure, obesity and high cholesterol levels-all of which are major risk for CVD. A diet lacking in fruits, vegetables, whole grains and lean proteins deprives the body essential nutrients that promote heart health.

2: Sedentary Lifestyle: Lack of regular physical activity is associated with a higher risk of CVD. Leading a sedentary lifestyle contributes to weight gain, high blood pressure, poor circulation and unfavorable changes in blood lipid profiles. Engaging in regular exercise helps maintain a healthy weight, improves cardiovascular fitness and enhances overall heart health.

3: Tobacco Use: Smoking or using tobacco products is a major risk factor for CVD. Tobacco damages blood vessels, increases blood pressure, reduces oxygen supply to the heart and promotes the formation of blood clots-all of which significantly raise the risk of heart attacks and strokes. Second hand smoke exposure is also detrimental to cardio vascular health. Until 2016, after China, India was the second largest consumer of tobacco. The prevalence of current tobacco smoking in males (23.6%) is higher than the global prevalence (22%).^[5]

4: Excessive Alcohol Consumption: Drinking excessive amounts of alcohol can lead to high blood pressure, irregular heart rhythms and damage to the heart muscles. It can also contribute to obesity and increase the likelihood of developing other cardiovascular risk factors such as diabetes. Light to moderate alcohol consumption (>150g/wk), was significantly associated with lower risk of CVD, relative to nondrinkers. Alcohol consumption was inversely associated with myocardial infraction and heart failure in dose response manner.^[6]

5: Stress: Chronic stress and unhealthy coping mechanisms such as over eating, excessive alcohol consumption or smoking can contribute to the development of CVD. Stress hormones released during periods of chronic stress can lead to elevated blood pressure, increased inflammation and change in blood vessel function all of which can damage the cardiovascular system over time. Throughout antiquity, the heart was believed to be the source of emotions. Psychological stress is a fundamental component of life, afflicting all humans with a range of frequencies and intensities. Acute stress distributed over several days also increase CVD risk. Chronic stress triggers unhealthy eating habits and a preference for unhealthy food. It also associates with hypertension and adiposity. Similarly, stress increases diabetes millets risk and worsens glycemic control among diabetics. Another key

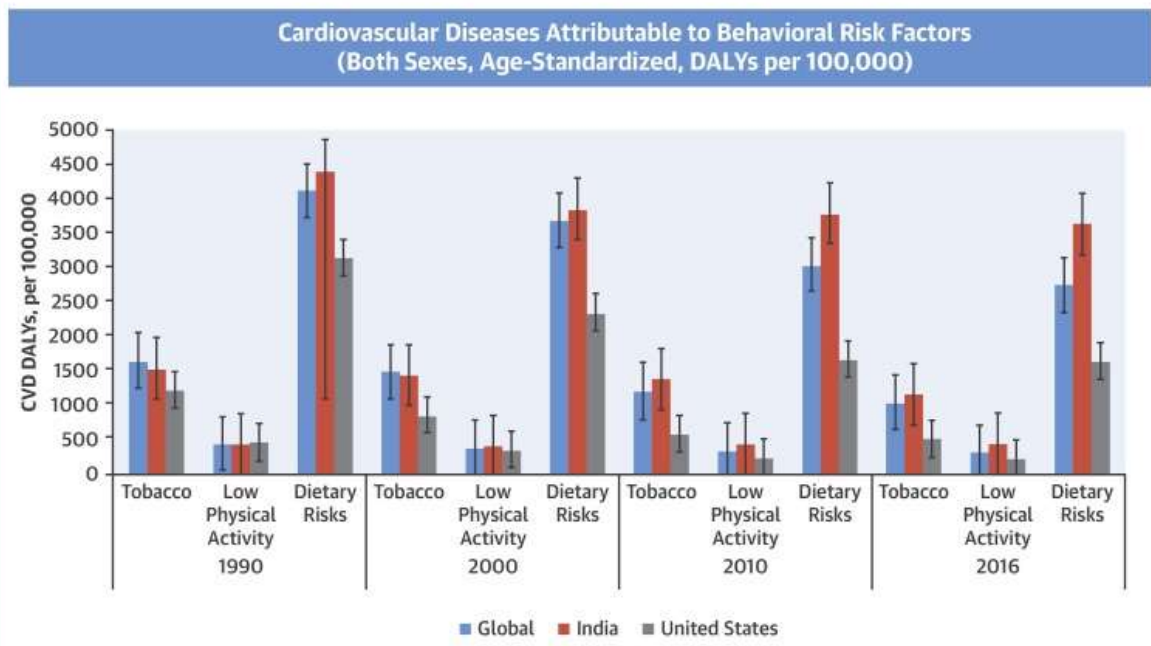
physiological consequence of chronic stress is immune system dysregulation.^[7]

6: Obesity and Overweight: Carrying excess weight, especially around the waist, increase the risk of developing various CVDs including coronary artery disease, heart failure and stroke. Obesity is closely linked to other risk factors like high blood pressure, high cholesterol and insulin resistance. Obesity has more than doubled in children and then tripled in adolescents over the past 30 years. As many as 33% of young adults are over weighted and this excess weight leads to increase in metabolic syndrome. For adults aged >20yrs, <50 % of women and, 40% of men of men of this age are screened for CHD risk.^[8]

Cigarette smoking in men is somewhat slightly more prevalent than in women, nearly 18 out of every 100 adult men (17.5%) still smoke cigarettes. The overall prevalence of cigarette smoking for adults 18 years of age or older is 15.5%. The health risks for cigarette smoking in women are equivalent to men.^[9] Smoking increases the risk of stroke in women especially who were using the oral contraceptive pills.^[15]

CVD death rates in rates in India are estimated to have risen from 155.7 to 209.1 per 100,000 between 1990 and 2016, although this number seems to be entirely due to population aging.^[10]

CENTRAL ILLUSTRATION: Cardiovascular Disease Disability-Adjusted Life-Years Attributable to Behavioral Risk Factors (Dietary Risks, Tobacco Use, and Low Physical Activity), Globally, in India and the United States From 1990 to 2016



Prabhakaran, D. et al. J Am Coll Cardiol. 2018;72(1):79-95.

It's important to note that making positive lifestyle changes can significantly reduce the risk of developing CVD. Adopting a healthy diet, engaging in regular physical activity, avoiding tobacco and excessive alcohol consumption, managing stress effectively and maintaining a healthy weight are all crucial steps in promoting.

COMMONLY OCCURRING CVD'S IN YOUNG ADULTS

While cardiovascular diseases are often associated with older age groups, certain types of CVD's can also occur in young adults. Here are some of the most commonly occurring types of CVD's in young adults.

1: Coronary Artery Disease: CAD is characterized by the narrowing or blockage of coronary arteries, which supply blood to the heart muscle. It can lead to chest pain, heart attacks or even sudden cardiac death. Risk factors for CAD in young adults including smoking, high blood pressure, high cholesterol, obesity, diabetes and a family history of premature heart disease. Coronary heart disease prevalence rates in India have been estimated over the past several decades and have ranged from 1.6% to 7.4% in rural populations and from 1% to 13.2% in urban populations.^[11]

2: Hypertensive Heart Disease: Hypertensive heart disease refers to heart conditions caused by high blood pressure. Young adults with uncontrolled hypertension are at risk of developing complications such as left ventricular hypertrophy, heart failure and arrhythmias. About 33% urban and 25% rural Indians are hypertensive. Of these, 25% rural and 42% urban Indians are aware of their hypertensive status. Only 25% rural and 38% of urban Indians are being treated for hypertension. One-tenth of rural and one-fifth of urban Indian hypertensive population have their BP under control.^[12]

3: Arrhythmias: Arrhythmias are abnormal heart rhythms that can range from harmless to life threatening. Conditions like atrial fibrillation or ventricular arrhythmias can occur in young adults due to various factors, including underlying heart conditions, substance abuse, stress and genetic factors. The global prevalence is estimated to be 0.47%, but there is significant regional variation.^[13]

4: Congenital Heart Disease: These are heart abnormalities present at birth. Some congenital heart defects may not manifest until adulthood or may be detected for the first time in young adulthood. These conditions can vary in severity ranging from minor issues to complex structural abnormalities that require medical intervention.

5: Cardiomyopathies: Cardiomyopathies are diseases that affect the heart muscle leading to impaired function. Hypertrophic cardiomyopathy, dilated cardiomyopathy and arrhythmogenic right ventricular cardiomyopathy are examples of cardiomyopathy's that can affect young adults. These conditions may be hereditary or acquired.

DRUGS CAUSING CVD'S

There are several medications that have been associated with an increased risk of cardiovascular disease in younger adults. It's important to note that these medications may have benefits that outweigh the potential risks, and the decision to use them should be made in consultation with a health care professional. Here are few examples.

1. Nonsteroidal anti-inflammatory drugs (NSAID's): Certain NSAID's, especially when used in high doses or for prolonged periods, have been linked to an increased risk of heart attacks and strokes. Examples include ibuprofen, naproxen and diclofenac.
2. Oral contraceptives: Some studies have suggested that certain types of oral contraceptives, particularly those containing estrogen may increase the risk of blood clots, which can lead to heart attacks or strokes, especially in women who smoke or have other risk factors of CVD.
3. Some anti-psychotic medications: Certain anti-psychotic drugs such as clozapine and olanzapine have been associated with an increased risk of weight gain, diabetes and dyslipidemia all of which can contribute to CVD.
4. Systemic corticosteroids: Prolonged use of systemic corticosteroids such as prednisone can lead to adverse metabolic effects including increased blood pressure, elevated blood glucose level and dyslipidemia, which can contribute to CVD.
5. Some anti-depressant medications: Certain anti-depressants such as tricyclic anti-depressants and selective serotonin re uptake inhibitors have been associated with adverse effects on blood pressure, heart rate and the electrical conduction system of the heart, potentially increasing the risk of cardiovascular events in susceptible individuals.

Some drugs may cause or exacerbate heart failure by causing direct myocardial toxicity; by negative inotropic, lusitropic or chronotropic effects; by exacerbating hypertension; by delivering a high sodium load ;or by drug- drug interactions that limits the beneficial effects of heart failure medications.^[14] It is important to note that the relationship between these medications and cardiovascular disease is complex and individual factors such as underlying health conditions, dosage and duration of use can influence.

Preventive Measures

By using the following measures, it is possible to control the cardiovascular diseases to a certain extent.

1. Try to limit saturated fats, foods high in sodium and added sugars.
2. Eat plenty of fresh fruit, vegetables and whole grains.
3. Get regular physical activity to help you maintain a healthy weight and lower your blood pressure, cholesterol and blood sugar levels.
4. The best things you can do for your health is to not use tobacco in any form.

5. Recognize and reduce stress in your life.

CONCLUSION

From the above article it is concluded that young adults are more prone to cardiovascular diseases due to their limited knowledge and poor attitudes regarding cardiovascular disease and its risk factors. Effective cardiovascular disease risk prediction in younger adults is crucial for early intervention and prevention strategies. Integrating comprehensive risk factors, embracing advanced predictive models, and promoting lifestyle modifications can collectively enhance our ability to identify and mitigate cardiovascular risks in this demographic, ultimately contributing to improved long-term heart health outcomes. This review demonstrates that there is an urgent need to build knowledge of cardiovascular risk identification in this population group.

REFERENCE

1. Olumide Ebenezer Olufayo, Ikeoluwapo Oyeneye Ajayi, Samuel Osobuchi Ngene risk factors among first-year students at the University of Ibadan, Nigeria: a cross-sectional study, DOI: 10.1590/1516-3180.2021.0998.11052022.
2. Nevadans Dieu-My T. Tran, Nirmala Lekhak, Karen Gutierrez, Sheniz Moon Risk factors associated with cardiovascular disease among adult, <https://doi.org/10.1371/journal.pone.0247105>
3. Hamza Loukili1,2*, Gabriel Malka1, Helene Landrault1, Driss Frej and Mohamed Amine, Mohammed VI, Ben Guerir, Mohammed V, Marrakech, Morocco Cardiovascular Diseases Risk Factors Among Young Adults: A STEP wise Approach-Based Study in Three University Setups in Morocco. DOI:10.2174/1874944502013010464, 2020; 13: 464-469.
4. Ann Marie Navar, Lawrence J. Fine, Walter T. Ambrosius, Arleen Brown, Pamela S. Douglas, Karen Johnson, Amit V. Khera, Donald Lloyd-Jones, Erin D. Michos, Mahasin Mujahid, Daniel Muñoz, Khurram Nasir, Nicole Redmond, Paul M. Ridker, Jennifer Robinson, David Schopfer, Deborah F. Tate, Cora E. Lewis Earlier treatment in adults with high lifetime risk of cardiovascular diseases: What prevention trials are feasible and could change clinical practice? <https://doi.org/10.1016/j.ajpc.2022.100430>.
5. A. Sreenivas Kumar a, Nakul Sinha Cardiovascular disease in India: A 360-degree overview Author links open overlay panel <https://doi.org/10.1016/j.mjafi.2019.12.005>.
6. Xinyuan Zhang, Yan Liu, Shanshan Li, Alice H. Lichtenstein, Shuhua Chen, Muzi Na, Susan Veldheer, Aijun Xing, Yanxiu Wang, Shouling Wu & Xiang Gao. Alcohol consumption and risk of cardiovascular disease, cancer and mortality: a prospective cohort study <https://pubmed.ncbi.nlm.nih.gov/33522924/>.
7. Michael T. Osborne, Lisa M. Shin, Nehal N. Mehta, Roger K. Pitman, Zahi A. Fayad and Ahmed Tawakol Disentangling the Links Between Psychosocial Stress and Cardiovascular Disease <https://doi.org/10.1161/CIRCIMAGING.120.010931> Circulation: Cardiovascular Imaging, 2020; 13: e010931.
8. Jennifer Arts 3, Maria Luz Fernandez 4, Ingrid E. Lofgren 3 Coronary Heart Disease Risk Factors in College Students Author links open overlay panel. <https://doi.org/10.3945/an.113.005447>.
9. James M Rippe 1 Lifestyle Strategies for Risk Factor Reduction, Prevention, and Treatment of Cardiovascular Disease. DOI: 10.1177/1559827618812395.
10. Panel Satoru Kishi, Gisela Teixido-Tura Hongyan Ning Bharath Ambale Venkatesh, Colin Wu, Andre Almeida, Eui-Young Choi, Ola Gjesdal, David R. Jacobs Jr., Pamela J. Schreiner, Samuel S. Gidding, Kiang Liu, João A.C. Lima Cumulative Blood Pressure in Early Adulthood and Cardiac Dysfunction in Middle Age: [*https://doi.org/10.1016/j.jacc.2015.04.042](https://doi.org/10.1016/j.jacc.2015.04.042).
11. Mark D Huffman 1, Dorairaj Prabhakaran, Clive Osmond, Caroline H D Fall, Nikhil Tandon, Ramakrishnan Lakshmy, Siddharth Ramji, Anita Khalil, Tarun Gera, Poornima Prabhakaran, S K Dey Biswas, K Srinath Reddy, Santosh K Bhargava, Harshpal S Sachdev Incidence of cardiovascular risk factors in an Indian urban cohort results from the New Delhi birth cohort. DOI: 10.1016/j.jacc.2010.09.083.
12. Raghupathy Anchala 1, Nanda K Kannuri, Hira Pant, Hassan Khan, Oscar H Franco, Emanuele Di Angelantonio, Dorairaj Prabhakaran Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension DOI:10.1097/HJH.000000000000146.
13. Daljeet Kaur Saggu 1, Gomathi Sundar 1, Sandeep G Nair 1, Varun C Bhargava 2, Krishnamohan Lalukota 1, Sridevi Chennapragada 1, Calambur Narasimhan 1, Sumeet S Chugh 3 Prevalence of atrial fibrillation in an urban population in India: the Nagpur pilot study. DOI: 10.1136/heartasia-2015-010674.
14. Robert L. Page II, Cindy L. O'Bryant, Davy Cheng, Tristan J. Dow, Bonnie Ky, C. Michael Stein, Anne P. Spencer, Robin J. Trupp and Jo Ann Lindenfeld Drugs That May Cause or Exacerbate Heart Failure A Scientific Statement From the American Heart Association. <https://doi.org/10.1161/CIR.0000000000000426>.
15. Bonam Jyothi1, Sripada Ramam1*, Kuppli Venkata Sai Kiran1, Sathish Kalluri1, Lolla Siddhartha1, Magharla Dasaratha Dhana Raju1 Smoking: A Major Risk Factor for Stroke. ISSN: 2321-3647.