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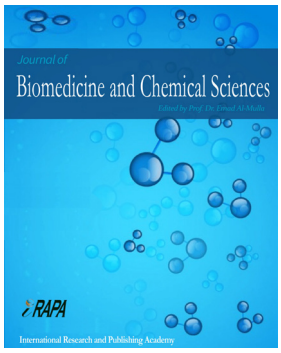

Association between High Blood Pressure and Cardiovascular Disease in Iraq: Review

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ABSTRACT

The study utilised a comprehensive framework to gather all the literature on High Blood Pressure and Cardiovascular Disease in Iraq. Comprehensive searches were conducted without imposing temporal restrictions in the academic databases, including Web of Science, Scopus and PubMed. The search query comprised various combinations of the terms such as hypertension, cardiovascular disease (heart diseases), and myocardial infarction. The findings reveal that there is substantial evidence connecting hypertension to CVD generally, and it is particularly prevalent in Iraq, where hypertension is a leading cause of cardiovascular disease. The development and worsening of hypertension and CVD are both facilitated by endothelial dysfunction, making the endothelial function of the utmost importance. Immigrants and Iraqis are at increased risk for cardiovascular disease (CVD) due to type 2 diabetes, which highlights the need to take certain preventative actions.

INTRODUCTION

One of the most common ailments is hypertension, or high blood pressure. Many say this disease concerns them because it causes heart attack and stroke, which kill millions around the world each year. In recent years, the number of hypertension patients has been growing at an alarming rate. Humans with Hypertinsure about 1 billion. The developing countries are particularly hard-hit What is more worrying than increasing numbers that have already skyrocketed--it's LMICC soaring These countries have also been especially hard hit by the burden of hypertension due to various socioeconomic aspects including income, wealth, employment status and place of residence (Vassy, et al., 2020). Hypertension with its 41.5 incidence rate for every 1000 people is a big concern in Iraq. It is no different for children, obesity, poor dietary choices and lack of physical activity are all also associated with increasing risk of hypertension. Their experience makes clear how important it is to get hypertension under control and take measures prematurely (Baker & Aldin, 2022).

Several studies have reported the following biochemical markers for hypertension: electrolytes, C-reactive protein and serum bilirubin (Abba, et al., 2023). Plasma sodium level, according to studies, is a factor which affects the blood pressure response upon salt in diet. It is also helpful to understand how these indicators relate to blood pressure so as better comprehend the causes of hypertension (Mansouri, et al., 2023). Moreover, HHD is one of the leading causes of death and disability round the globe. In fact, it develops due to untreated hypertension. There are many potential complications related to hypertrophic cardiomyopathy (HD) including heart failure [HF], fibrosis, atrial fibrillation, systolic and diastolic dysfunction, vasculopathy ischemic heart disease left

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ventricular hypertrophy. Rates of myocardial infarction, congestive heart failure and stroke are higher in people with HHD than those for hypertension alone. Sudden death is also more frequent among these patients (Raleigh, et al., 2022).

Besides personal health, cardiovascular disease also has far-reaching social and economic repercussions. Despite great improvements in death rates over the last several decades, CVD remains a major cause of illness and mortality in England. People who are already at greater risk of serious illness or even death from COVID-19--those with quantifiable comorbidities such as high blood pressure (hypertension)--the pandemic has drawn further attention to the need for better control over cardiovascular disease (Højstrup, et al., 2023).

Population health must be improved by reducing socioeconomic barriers to prevention and management of hypertension. Increased access to health care, educational opportunities and economic justice are some of the other social variables that could also produce lower rates of hypertension. Moreover, more funding for health care would benefit the overall population in its health status and help reduce hypertension. Looking at the connection between hypertension and cardiovascular disease in Iraq is a major focus for this research. We hope that by gathering and assimilating information from several sources including the conference itself, we may bring some light to bear on this serious public health problem in Iraq.

METHODOLOGY

The study utilized a comprehensive framework to gather all the literature available on High Blood Pressure and Cardiovascular Disease in Iraq. Comprehensive searches were conducted without imposing temporal restrictions in the following academic databases: Web of Science, Scopus and PubMed. The search query comprised various combinations of the following terms: hypertension cardiovascular disease (heart diseases) myocardial infarction.

Prevalence of High Blood Pressure in Iraq

The epidemiology of hypertension in Iraq not only provides an understanding about changes to life styles as well both regional etiological trends, but also shows changing geographical differences between areas. To discover how prevalent hypertension is in the elderly and what factors may put them at risk, researchers conducted a community-based cross-sectional study of 375 people aged over fifty living in Erbil City South District, Kurdistan. Using a multistage sampling process, 1480 individuals were chosen for the research. The data indicated that 54. Hypertension affected 7% of those who took part in the research (Saka, et al., 2020).

The number of hypertensive patients was 46. 53% were new cases, while 4% were established ones. During the survey, 6% of participants received a new diagnosis. Factors such as age, being male, being unemployed, and being overweight were shown to be significantly related to hypertension in the multivariate analysis. There was a 1 for every year that people's ages increased. increased risk of hypertension by a factor of 1. Men exhibited a 2. The odds were seventy-two times greater for men than for women, and the unemployment rate was one in ten. Compared to those who are employed, the probabilities are 85 times greater. Additionally, being overweight was shown to be a substantial risk factor, with a 2. 20 times better chances (Bennet, et al., 2013). These results show that hypertension is common among the elderly in Erbil City, and that many of these instances go undetected. Private pharmacies were the main means of obtaining medication, which may indicate a lack of public healthcare options for hypertension management in this area (Budreviciute, et al., 2020).

In addition, prior studies in Iraq have also shown that hypertension is rather common. In 2006, researchers in Iraq found a prevalence rate of 40. 4%, but the WHO recorded a prevalence rate of 29. 4% for males and females in 2008 (Qadir & Weli, 2023). Iraq is among the low- and middle -income nations with too few health providers and drugs, so most people suffering from hypertension go undiagnosed or untreated. Because of ignorance and a lack of prevention methods, cardiovascular diseases such as heart disease and stroke can have more illnesses and deaths. The surprisingly high rate of hypertension in Iraq, including Erbil City's Mirror Land Creditor shows just how pressing it is to carry out effective management and prevention.

These efforts should also include programs for comprehensive health education to spread the work about untreated hypertension and remind people to get their blood pressure checked. On top of this, screening programs may help catch diseases still unknown to medicine a little earlier and treat them more appropriately (Saka, et al., 2020). Therefore, the effective way to avoid hypertension is eliminating its underlying risk factors. The promotion of healthy lifestyle choices such as eating well, getting regular exercise and not smoking; encouragement to maintain a suitable body weight. Furthermore, people with

hypertension should be able to have easier access to health care and drugs for controlling their condition (Qadir & Weli, 2023).

Types of Cardiovascular Diseases in Iraq

Hypertension is the most important risk factor for cardiovascular illnesses [CVDs], which are one of Iraq's biggest health problems. Hypertension can help prevent heart disease, stroke and kidney failure. People in low- and middle-income nations such as Iraq are particularly vulnerable to hypertension, but most of them don't even know they have it (Saka, et al., 2020). According to studies, the prevalence percentage of hypertension in Iraq ranges between 26.5 % and 40.4 %. This suggests that hypertension is a major health concern in Iraq. The prevalence of hypertension, which accounts for about half of all instances of cardiovascular disease (CVD), has a major influence on global cardiovascular health (Bennet, et al., 2013). Ischemic heart disease, stroke, and heart failure are among the most prevalent cardiovascular diseases in Iraq, alongside hypertension. When the coronary arteries that provide blood to the heart are constricted, it may cause ischemic heart disease, which is also called coronary artery disease. This condition can lead to heart attacks (Budreviciute, et al., 2020).

Heart disease affects both sexes equally, but males are more likely to suffer from it. But in industrialized nations, CVDs still kill more women than any other cause. The onset and worsening of cardiovascular diseases are accelerated by risk factors including unhealthy eating habits, tobacco use, obesity, lack of physical exercise, high blood pressure, cholesterol, and blood sugar (Qadir & Weli, 2023). To lessen the impact of CVDs, prevention is of paramount importance. If we can control these important risk factors well--eating properly, exercising routinely, not smoking and maintaining a healthy weight; managing proper levels of blood sugar, cholesterol and pressure--we will be able to reduce the number of CVDs by drastic proportions. Such studies have linked PD to CVDs, and the importance of early detection and treatment for better cardiovascular health has been emphasized (Iyanda et al., 2023).

In the end, hypertension is what accounts for most of Iraq's high rate of cardiovascular disease. Hypertension has a high prevalence among the populace of Iraq, and cardiovascular diseases such as ischemic heart disease, stroke or heart failure are common. In Iraq, CVDs now exert an enormous burden on public health but early identification and treatment of associated diseases such as PD; preventative operations; and eliminating risk factors are all part of the solution (Mansour, 2012).

Prevalence and Incidence Rates

High incidence rates and prevalence for a variety of cardiovascular illnesses in Iraq are very concerning. Most deaths from non-communicable diseases are caused by cardiovascular disorders. CVDs, however, have disproportionately high rates among Iraq's youth and are one of the country's leading causes of mortality from illness (Saka, et al., 2020). Among the various types of CVDs, ischemic heart disease [IHD] is the most common and accounts for a significant number of deaths. This condition is caused by narrowed coronary arteries that limit blood flow to the heart muscle, potentially leading to heart attacks. Other types of CVDs include stroke, congenital heart disease, coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, arrhythmia, aortic disease, cardiomyopathies, deep vein thrombosis and pulmonary embolism, heart failure, heart valve disease, pericardial disease [pericarditis], and vascular disease (Vassy, et al., 2020).

The prevalence of risk factors associated with CVDs is also alarming. Hypertension is highly prevalent among Iraqi diabetic patients and affects approximately 90% of them. It is estimated that around 50% of diabetic patients in Iraq do not achieve target blood pressure levels. Hypertension is considered a major public health problem worldwide and is responsible for a significant proportion of CVDs globally (Bennet, et al., 2013). Heart disease risk factors also include cigarette smoking, insufficient physical exercise, poor dietary choices, high blood sugar and cholesterol levels, excess body fat, and unmanaged blood pressure. To mitigate these risks, people should eat healthily, exercise regularly, not smoke or be around people who smoke, keep their weight in a healthy range, and regulate their blood pressure and cholesterol levels (Budreviciute, et al., 2020). Because most CVDs are preventable via healthy lifestyle choices, addressing these risk factors is vital. Because cardiovascular diseases (CVDs) account for a disproportionate share of all deaths worldwide, it is critical that all nations, even those with weak health systems, have access to effective care and prevention programs (Qadir & Weli, 2023).

Finally, cardiovascular disorders are quite common in Iraq, particularly among the younger generation. Heart disease, stroke, and other vascular diseases are the leading causes of death from cardiovascular disease. The development of CVDs is influenced by risk factors include hypertension, smoking, inactivity, poor nutrition, and high cholesterol and blood sugar levels. Iraq may greatly lessen the impact of CVDs by implementing lifestyle interventions to target these

risk factors and implement preventative measures (Mansour, 2012).

Mechanisms Linking Hypertension and Cardiovascular Disease

The Risks of Atherosclerosis and Vascular Damage

One of the main ways that hypertension (high blood pressure) may lead to cardiovascular disease is via vascular damage and atherosclerosis (Saka, et al., 2020). Heart disease, stroke, and peripheral artery disease are all forms of cardiovascular disease, which affects the heart and blood arteries. Worldwide, the incidence of hypertension is on the rise, making it a key contributor to the development of cardiovascular disease (Vassy, et al., 2020). Complications including cardiovascular disease, renal disease, stroke, and coronary artery disease (CAD) may be prevented or delayed with the treatment of moderate hypertension, according to studies. According to a national survey, the overall prevalence of hypertension in Iraq is 41.5 per 1000 persons, which is a considerable number. It is essential to evaluate the health condition of individuals with chronic hypertension by assessing numerous biochemical indicators (Iyanda, et al., 2023). Furthermore, it has been shown that lifestyle variables such food choices, lack of physical activity, and obesity are associated with hypertension in children. Reducing the burden of chronic illnesses has been shown to be possible by preventive efforts that target cardiovascular risk factors, such as hypertension. To reduce the likelihood of cardiovascular events, more must be done to educate the public about hypertension and its early prevention and management methods. To effectively treat this worldwide health hazard, it is crucial to understand the link between high blood pressure and cardiovascular disease (Dyball, et al., 2019; Bhatnagar, et al., 2015; Poznyak, et al., 2022).

Hemodynamic Effects

Heart disease, stroke, peripheral artery disease, and other forms of cardiovascular disease [CVD] are all made more likely by hypertension. Particularly among American soldiers, it ranks first among causes of mortality and hospitalization (Qadir & Weli, 2023). Because CVD is also an issue in Basrah, Iraq, researchers have looked at the frequency of hypertension among diabetic individuals. There is strong evidence that reducing blood pressure lowers the chances of cardiovascular events such as heart attacks, strokes, heart failure, and death (Iyanda, et al., 2023). According to research, it is more helpful to keep systolic blood pressure below 120, rather than 140, as is recommended by current standards. Male veterans of the Iraq and Afghanistan wars are more likely to suffer from hypertension and post-traumatic stress disorder (PTSD), both of which increase the risk of cardiovascular disease among military members (Dyball, et al., 2019). Hypertension's association with cardiovascular disease (CVD) is explained by hemodynamic effects on the cardiovascular system, which include vascular damage, a higher risk of blood clots and atherosclerosis, and an increased likelihood of blood vessel damage. Besides promoting inflammation and thrombosis, loss of endothelial function is another complication caused by hypertension [17]. Key strategies to reduce cardiovascular risk are enhanced endothelial function and reduced blood pressure especially by means of antihypertensive medication (Mohamed, et al., 2010). The processes that cause endothelial dysfunction in hypertension might be better understood, and improved methods of preventing or treating cardiovascular disease developed.

Dysfunction of the Endothelium

Despite this, the relationship between hypertension and cardiovascular disease is complex; endothelial dysfunction has a major role to play. The leading cause of death in the United States is cardiovascular disease, including peripheral artery diseases (PAD), hypertension, myocardial infarction and stroke (Iyanda, et al., 2023). This illness is more likely to affect veterans because of their predisposition to other health problems, such as diabetes and post-traumatic stress disorder (Dyball, et al., 2019). Treatment of moderate hypertension can reduce the risk of hypertension-related complications, according to research. The SPRINT trial provided further evidence of this link by showing that systolic blood pressure below 120 mmHg considerably reduces the risk of cardiovascular events, strokes, and death (Poznyak, et al., 2022).

Hypertension and other cardiovascular diseases have been associated with post-traumatic stress disorder (PTSD) among male veterans. Endothelial dysfunction is an important concept to understand since it increases the risk of cardiovascular events due to abnormalities in the lining of blood vessels. Antihypertensive medication is one strategy for improving endothelial function, which in turn lowers the risk of cardiovascular disease (Zardawi, et al., 2016). If we want to find ways to prevent and cure cardiovascular disease, we need to know that high blood pressure is a risk factor. Interventions may

enhance cardiovascular health and reduce the risks of high blood pressure by focusing on endothelial dysfunction (Dharmashankar & Widlansky, 2010; Mansouri, et al., 2023).

Inflammatory Pathways

Inflammatory pathways have a role in the high prevalence of hypertension and cardiovascular disease (CVD) in Iraq. Hypertension affects atherosclerosis, which is a precursor to several cardiovascular diseases (Dyball, et al., 2019). As a result of hypertension, hypertensive heart disease [HHD] develops, which raises the risk of cardiovascular events and is linked to a host of other cardiac and vascular problems. A more effective strategy for managing hypertension is necessary since the incidence of HHD is on the rise worldwide (Poznyak, et al., 2022). Improving cardiovascular outcomes requires a better understanding of the processes that connect hypertension with endothelial dysfunction (Dharmashankar & Widlansky, 2010). Also, hypertension and post-traumatic stress disorder (PTSD) may go hand in hand, according to some research. Cardiovascular diseases afflict male veterans with post-traumatic stress disorder at a ratio of 1. People with PTSD should get early cardiovascular disease health guidance from clinicians. When it comes to lowering the risk of cardiovascular events, managing hypertension is crucial (Einarson, et al., 2018).

Factors Influencing the Association

Socioeconomic Factors

Blood pressure and cardiovascular disease are strongly impacted by socioeconomic variables in Iraq (Saka, et al., 2020). Many instances of hypertension in Erbil City do not be detected, which is a very concerning occurrence. Important socioeconomic variables associated with hypertension include gender, age, unemployment, obesity, and lack of medication access (Qadir & Weli, 2023; Baker & Aldin, 2022). These factors should be considered when designing all-encompassing health education and screening programs to address this problem. To help low- and middle-income nations like Iraq overcome their problems, policymakers should create focused initiatives. There are certainly investments you can make in healthcare, education, housing and gender equality that will lower the incidence of hypertension indirectly. (Dyball, et al., 2019). To help prevent hypertension and reduce its impact on cardiovascular health in Iraq, it is important to deal with socioeconomic factors (Abba, et al., 2023).

Lifestyle Modifications

Changes in lifestyle are the only way to reduce Iraq's high prevalence of hypertension and cardiovascular disease. With risk variables, including gender, age employment status and being overweight having been identified there must be prevention and control measures. Comprehensive health education program should aim at promoting healthy life styles, including exercise regularly and eating a balanced diet. Screening attempts identify persons at risk who can receive early interventions (Loukili, et al., 2019). Easy access to health care services and low-priced pharmaceuticals ought to be assured through public facilities or subsidized programs. The factors which are social and economic, such as education; wealth inequality; gender equality: human rights all affect this greatly (Dyball, et al., 2019). Deficiencies in physical activity, smoking and overweight/obesity are all modifiable risk factors; therefore, they should be treated with specifically targeted treatments. If these plans become reality, Iraq can reduce the effect of cardiovascular disease and even improve its public health.

Pharmacological Interventions

Pharmacological treatments are necessary as a weapon against the link between hypertension and cardiovascular disease in Iraq (Bennet, et al., 2013). Because so little is known about the scope or reasons for uncontrollability of hypertension in Iraq, it's important to evaluate patient adherence and trends related to antihypertensive drug prescriptions. Regarding cardiovascular disease, Military personnel and veterans who have been in the Iraq or Afghanistan wars are more likely to suffer from Post-Traumatic Stress Disorder (PTSD) (Loukili, et al., 2020). Post-traumatic stress disorder (PTSD) is also connected with tobacco use, dyslipidemia, obesity, hypertension and increased heart rate as well as circulatory illnesses (Nassr & Forsyth, 2019). To study the impact of post-traumatic stress disorder (PTSD) on physical health, methods must be standardized (Dyball, et al., 2019; Mansouri, et al., 2023). Since assessing the relationship between hypertension and cardiovascular illness in Iraq, both general norms for accepted diseases (atherosclerosis or hardening of arteries; angina pectoris; heart failure; stroke) need to be considered as well. Low rates of hypertension management are a worldwide problem, contributing to the rising incidence of hypertensive heart disease (Einarson, et al., 2018). If hypertensive heart disease is to have an improved prognosis, hypertension must be intensively controlled. Several risk factors contribute to cardiovascular disease, which

is a leading cause of death in the globe at an early age. The burden of cardiovascular disease may be used to identify areas that need more funding for research and interventions (Højstrup, et al., 2023). Disparities in the delivery and results of care for cardiovascular disease relate to socioeconomic status.

Healthcare Policy Implications for Iraq

There are major ramifications for healthcare policy in Iraq due to the high incidence of hypertension and the inadequate management of blood pressure in diabetic patients. [8] To better comprehend the variables linked to suboptimal blood pressure management across cohorts, epidemiological data is required. Furthermore, there is substantial evidence that connects post-traumatic stress disorder (PTSD) to cardiovascular illness, namely hypertension, in veterans and active-duty military members (Loukili, et al., 2020; Nassr & Forsyth, 2019). Future research on the effects of PTSD on physical health must use standardized methodologies (Dyball, et al., 2019). There has been a worldwide upsurge in hypertensive heart disease [HHD], and the Eastern Mediterranean area is no exception. Although worldwide rates of blood pressure control are poor, intensive management of hypertension is critical for improving the prognosis of HHD. We need effective techniques to enhance control of blood pressure (Mansouri, et al., 2023).

The globe over, there are clear socioeconomic disparities in the treatment and results of cardiovascular disease. In terms of cardiovascular risk factor objectives and medical treatment indicated by guidelines, lower socioeconomic status is related with inferior accomplishment. Patients from low-income backgrounds are at reduced risk in the long run if these inequalities are addressed (Roth, et al., 2020). Is a Public policy, clinical practice, and the development of health systems may all benefit from a better understanding of patterns and trends in cardiovascular disease. Investments in cardiovascular research may be better informed by analysing long-term patterns, which can also reveal which locations have the greatest illness burden. Tobacco and alcohol use, lack of physical activity, obesity, and high blood pressure are modifiable risk factors that must be addressed if cardiovascular illnesses are to be prevented (Højstrup, et al., 2023). Improving cardiovascular health outcomes in Iraq requires addressing the effects of post-traumatic stress disorder (PTSD) on physical health, implementing effective strategies for blood pressure control, reducing socioeconomic disparities in healthcare delivery, and focusing on modifiable risk factors for cardiovascular disease.

Discussion

Numerous studies have examined the link between hypertension and cardiovascular disease (CVD), and the results consistently show that hypertension significantly increases the likelihood of developing CVD. Hypertension, or high blood pressure, is defined as arterial blood pressure readings that are consistently higher than normal. It has been frequently noted that those with hypertension have a greater prevalence of CVD compared to those without hypertension (Jimenez, et al., 2023). The Researchers in Iraq have also looked at the link between hypertension and cardiovascular disease. Research in Iraq has shown that cardiovascular disease is more common among those with type 2 diabetes than among those without the disease. This provides further evidence that type 2 diabetes stands on its own as a CVD risk factor in Iraqis. Additionally, compared to native Swedes, Iraqi immigrants had a greater chances ratio of CVD due to the occurrence of type 2 diabetes is a Developing and worsening hypertension and CVD are greatly impacted by endothelial dysfunction, which is defined as decreased functioning of the endothelium, the inner lining of blood vessels (Roth, et al., 2020).

A proinflammatory state, cell proliferation, and vasoconstriction are hallmarks of endothelial dysfunction. Atherosclerosis, vascular remodelling, and inflammation of the blood vessels have all been linked to it (Fuchs & Whelton, 2020). The development of endothelial dysfunction in hypertension is influenced by many processes. Among them, you may find the renin-angiotensin system activated, inflammation, oxidative stress, and poor vascular shear stress. Endothelial dysfunction may also result from problems with the endothelium's capacity to create and make available nitric oxide [NO], a crucial vasodilator (Højstrup, et al., 2023). The importance of a healthy endothelium in sustaining proper cardiovascular function should not be underestimated. An early indicator of atherosclerosis and related diseases such diabetes, high blood pressure, and dyslipidemia is endothelial dysfunction. In addition to smokers, those with sleep disorders, chronic inflammatory diseases, and chronic stress all have it.

Gallo, et al. (2022) conducted a research study on the negative effects of noise on the cardiovascular system lends credence to the link between endothelial dysfunction and CVD. Animal studies have shown that exposure to noise may harm the heart and endothelial cells. The processes by which noise-induced harm

happens are still being studied (Bennet, et al., 2013). Because it is responsible for a disproportionate share of both early mortality and healthcare expenditures, CVD continues to be a major problem in public health across the world. To inform public policies and decisions, it is crucial to examine global CVD trends and patterns over the long term. Cardiometabolic, behavioural, environmental, and social variables are among the many risk factors for cardiovascular disease that have been found in studies that have quantified the disease's impact (Bennet, et al., 2013). Finally, there is strong evidence linking high blood pressure to cardiovascular disease in Iraq. An individual risk factor for several CVD outcomes is high BP. When it comes to hypertension and CVD, endothelial dysfunction is a major player.

CONCLUSION

There is substantial evidence connecting hypertension to CVD generally, and it is particularly prevalent in Iraq, where hypertension is a leading cause of cardiovascular disease. The development and worsening of hypertension and CVD are both facilitated by endothelial dysfunction, making endothelial function maintenance of the utmost importance. Immigrants and Iraqis are at increased risk for cardiovascular disease (CVD) due to type 2 diabetes, which highlights the need of taking certain preventative actions. The complex nature of risk factors for cardiovascular disease is further shown by the fact that noise exposure has been associated with endothelial dysfunction and cardiac injury. Thorough investigation of long-term patterns and a diverse range of risk variables, including cardiometabolic, behavioural, environmental, and social components, is necessary to alleviate the heavy load of CVD. With this information in hand, we can design preventative tactics that work in Iraq.

Competing Interest

The authors had no competing interests.

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