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Review Article

Prevalence of Metabolic Syndrome and Associated Risk Factors Among Indigenous Indian Women

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Abstract

Metabolic Syndrome (MetS) is a bunch of conditions that increases the risk of heart disease, stroke, diabetes etc. MetS includes hypertension, diabetes, excess centripetal body fat, abnormal cholesterol levels etc. and it increases a person's risk of heart attack and stroke. MetS is one of the major causes of death and disability globally. In India, several studies have revealed that various modifiable risk factors are responsible for a huge number of disabilities and deaths due to MetS among indigenous peoples especially among women. Hypertension, dyslipidemia and diabetes are significantly prevalent among indigenous women, which may indicate the high rate of heart attack and diabetes among them. The MetS are becoming a burden to indigenous women in India because of their proper knowledge and ignorance about their personal health. In remote rural areas, indigenous women have their own ethnic healing methods and rare reluctant to receive modern health care. They still believe that diseases are caused by super natural forces and can only be controlled by supernatural means. In India, the high commonness of MetS risk factors among indigenous women's societies needs the immediate attention of the policy makers and healthcare providers. Society and at-risk individuals must be prevented by proper strategies to improve their health conditions. The Government of India is responsible for providing quality and modern healthcare to them. In addition to government activities, a number of NGOs are working in healthcare sector among indigenous peoples in India. So, Health and Hygiene awareness camps need to be organized regularly to maintain their regular health.

Keywords: MetS; MetS Risk Factors; Indigenous Indian Women

Introduction

India is home to more than seven hundred indigenous groups. According to 2011 census, nearly 104 million people (approximately 8.6% of national population) are indigenous in India. Among them, a large number are found in the 'Seven Sister States' (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura) of north eastern part of India. They are also available in large numbers in Madhya Pradesh, Maharashtra, Bihar, Jharkhand, Rajasthan, Gujarat, Andhra Pradesh, Tamil Nadu, Chhattisgarh, Odisha, West Bengal and the Andaman and Nicobar Island etc. The common features of these communities are their distinct geographical location, specific cultural practice, socio-economic backwardness etc. In India, several problems like illiteracy, low healthcare facilities etc. are still associated with these people. The purpose of this review article is to systematically narrate the prevalence of MetS risk factors among the indigenous women in India.

Global burden and future trends of MetS

Metabolic Syndrome (MetS) is a group of conditions that elevates the risk of heart disease, stroke, diabetes etc. It includes

high blood pressure, high blood sugar, abdominal obesity; abnormal cholesterol levels etc. and cluster of these conditions increase a person's risk of heart attack and stroke [1]. It is recognized the significant cause of global deaths and illness for all sex and age groups. World Health Organization (WHO) calculated that more than 17.3 million people were died due to heart disease in 2008, representing nearly 30% of all deaths worldwide. Out of these 17.3 million deaths, the share of coronary heart disease (CHD) and stroke were 7.3 and 6.2 million respectively. It is further calculated that the number of people who die due to heart disease globally will grow to reach more or less 23 million by 2030 annually. MetS is considered as a crucial public health issue in low and middle income countries like India. According to WHO, 80% of CVD associated deaths will take place in low and middle income countries and happen nearly equal in both men and women. MetS linked morbidity and mortality differ among countries and in low and middle income countries increasing at a much faster speed compared to high income countries [2,3]. The south Asian community compared to others, affected by CHD at least ten years advance [4]. Thus the prevention of MetS in Asia is a crucial issue for world public health providers, because the Asia, comprising half of the world's population is one of the major zones with the highest burden of MetS in the world. MetS is the major cause of loss of life for all age groups. The status of childhood and adolescent risk factors projects adult MetS [4]. Among children and adolescents, obesity has recent and lifelong effect on health. It increases the chances of MetS illness in middle or late adult age. The prevalence of childhood overweight and obesity raises 1.5 folds in last two decades globally. Several studies showed that childhood obesity is significantly related with risk factors for adult chronic diseases like Type 2 Diabetes Mellitus (T2DM), Dyslipidemia, Hyperinsulinemia etc. [5]. There are a number of studies which propose that Atherosclerosis, Body Mass Index (BMI) and Hypertension are correlated with MetS risk factors in early ages of life of the same individual [6].

MetS is the major cause of death and disability among indigenous population globally. In 2004, Archer., *et al.* showed that the 36% of Native American people have at least one defective lipid profile. The prevalence of high blood pressure and obesity among Native Americans was 32% and 47% respectively [7]. In 2006, Struthers., *et al.* revealed that, the risk factors for heart diseases are high among Native American women. The study concluded that, Indian women have higher prevalence rates of high blood sugar, high systolic blood pressure and BMI [8]. Several studies mentioned that, the prevalence of high blood sugar, smoking tobacco and high blood pressure was higher among American Indians. In 2017, Jernigan., *et al.* mentioned that, the prevalence of diabetes, obesity and hypertension are more prevalent among tobacco users compared to non users among American Indians in USA. The study also showed that, participants with low physical activity levels are more susceptible to be diabetic and obese compared to recommended physical activity levels [9].

MetS risk factors among Indian indigenous women

MetS risk issues among indigenous Indian women in different regions of the country have been studied. There are several risk factors associated with MetS, which are divided into two major categories. Some risk factors are non-modifiable such as age, gender, ethnicity, family history of MetS etc. The risk factors that can be controlled such as blood pressure, blood sugar, overweight, obesity, lipid related factors and lifestyle factors etc. are modifiable risk factors. Large parts of MetS are affected by modifiable risk factors.

Non-modifiable risk factors

Age is one of the major non-modifiable risk factors. MetS continue to grow with age. In the absence of any disease, even over time, physiological changes occur in various organs, such as the, heart due to age. These changes in the heart can lead to heart disease. Hathur., *et al.* showed that blood pressure was significantly higher with increase in age among female in various ethnic groups of Mysore [10]. Sex is also a great aspect for acquiring MetS. Men are at higher risk of heart disease than pre-menopausal women due to sex hormones. Ethnic identity also plays an important role. People of African and Asian ethnicity have a higher risk of heart disease than other ethnic groups. People in south Asia are at higher risk of CVD disorders and T2DM associated with being overweight and obese than people on other countries. In addition, a positive family history of MetS increases the risk of MetS in both men and women. In 2011, Savitha., *et al.* revealed that the children born to parents with Ischemic heart disease are more susceptible to having abnormal lipid levels. Educational Status also plays an important

role [11]. Gupta., *et al.* in 2012 showed that the low educational status was associated with other risk factors and raises the risk of MetS [12].

Modifiable risk factors

Beside this, High blood pressure, diabetes, abnormal lipid level, overweight and obesity, lifestyle associated factors etc. are more common modifiable risk factors for MetS. High blood pressure can harm artery walls and elevates the risk of heart diseases. In 2013, Bhardwaj., *et al.* revealed that, 13.7% indigenous people in Himachal Pradesh are obese [13]. Kandpal., *et al.* revealed that, the prevalence of abdominal obesity is 33.7% among Rang Bhotias of Uttakhand [14]. In this same year, Kshatriya., *et al.* mentioned high prevalence of overweight among the Bhumijs, Dhodias, Kuknas and Santals of Odisha and West Bengal [15]. In 2012, Ramalingam., *et al.* revealed that, 38.2% tribal populations of Nilgiris are diabetic [16]. T2DM is associated with overweight and obesity which raises risk of heart diseases through other associated factors and strongly connected with high blood pressure beside T2DM. Hathur., *et al.* showed that the prevalence of high blood pressure among female was 16.5% and was significantly different among female in various ethnic groups of Mysore [10]. Radhakrishnan., *et al.* showed that, 61.2% women, aged 46-50 years are pre-hypertensive. This study also found that, 17.6% women were Stage I hypertensive (according to JNC-7 classification) among indigenous population in Tamil Nadu [17]. T2DM is one of the major modifiable risk factors for coronary heart disease among indigenous Indian women. Overweight and Obesity raises heart disease risk through other risk factors and significantly associated with hypertension beside T2DM. In 2011, Sachdev showed that the prevalence of high blood pressure was very high among the Nomad ethnic group of Rajasthan where 30.9% Bhopas (caste group of Nomad) were hypertensive, showing the highest frequency among other ethnic groups [18]. Beside this, in 2016, Kshatriya*., et al.* showed a high prevalence of high blood pressure among the Koras, Bathudis, and Oraons. Kshatriya*., et al.* also revealed that the prevalence of high blood pressure among the Bhumijs, Dhodias, Kuknas, and Santals of West Bengal and Odisha was most alarming [15]. In 2016, Kandpal., *et al.* mentioned that, 43.4% Rang Bhotias are hypertensive [14]. Dyslipidemia is another risk factor behind CVD among indigenous Indian women. High blood cholesterol level, high Low Density Lipoprotein (LDL) cholesterol level, high triglyceride (TG) level and low level of High Density Lipoprotein (HDL) cholesterol increases risk of MetS. In 2012, Ramalingam., *et al.* showed that, abnormal lipid profile is very familiar among various ethnic populations of Nilgiris, Tamil Nadu. In this study, the prevalence of high total blood cholesterol level and high triglyceride level was 21.2% and 15.2% respectively. Ramalingam., *et al.* also revealed that 42.2% people were found with borderline high LDL values and 87.9% people were found with low HDL level [16]. Bhardwaj., *et al.* (2013) mentioned that the prevalence of borderline to high level of TGs was 55.2% among tribal people in Himachal Pradesh [13].

In addition, unhealthy and sedentary lifestyle is significantly associated with an elevated risk for overweight and obesity. Physical inactivity is again associated with high blood pressure, T2DM, abnormal lipid profile etc. Kandpal., *et al.* mentioned that, the prevalence of high Body Mass Index (BMI) is 33.7% among Rang Bhotias of Uttakhand. This study also revealed that, sedentary lifestyle is significantly related with high BMI levels and unhealthy lifestyle is responsible for development of high blood pressure among Bhotias [14]. In addition, unhealthy diet also increases the risk for heart diseases. In 2017, Sen., *et al.* mentioned that, abdominal obesity was the major avoidable risk factor among indigenous Tripuri women [19]. Physical inactivity is connected with high cholesterol levels, hypertension etc. Several studies showed that diet including high saturated fats and trans fats are associated with heart disease risk by elevating the levels of cholesterol and blood pressure. On the other side, high sodium diet increases the risk of hypertension. Again, low intake of fruits and vegetables increases the risk of MetS. In 2016, Kshatriya., *et al.* found the high prevalence of undernutrition among Koras (51.9%), Bathudis (51.3%) and Oraons (49.6%) [15]. Consumption of alcohol and tobacco (smoking or chewing) are two leading preventable cause of CVD illness and death. In 2015, Radhakrishnan., *et al.* revealed that, smoking and alcohol consumption are significantly associated with tribal females in Tamil Nadu [17].

Discussion

Presently, increasing the burden of metabolic syndrome such as cardiovascular disease, diabetes, hypertension which is leading to increasing deaths and illness in developing countries is a major public health challenge. The health situation of indigenous peoples

in India is highly critical due to lack of proper health care. One of the most common causes of death among indigenous women and children is undernutrition. Lack of proper education, lack of primary healthcare and food insecurity continue to be major problems for India's indigenous peoples. In various remote areas, they have been practicing their own traditional healing methods. They are not willing to adopt modern technology in healthcare practice. They still believe in superstitions and supernatural forces and think that diseases are caused by supernatural forces [20].

MetS have become a major cause of illness and death in India. Current trends show that the disease has increased rapidly in young age groups and also in women in both urban and rural indigenous population. This present article focuses on prevalence of MetS risk factors among the indigenous women in India. Multiple studies in India have disclosed that various modifiable risk factors are responsible for thousands of deaths and illness due to MetS. The most commonly studied risk factors in India are age, sex, ethnicity, socio-economic status, family history of MetS, sedentary lifestyle, dyslipidemia, high blood pressure, high blood sugar, unhealthy diet, tobacco and alcohol consumption etc.

Conclusion

India has a comprehensive healthcare system. In India, both the central and state governments move the healthcare system for its residents. A large number of indigenous people are getting these government facilities for treatment. The 'National Rural Health Mission', 'National Urban Health Mission' and 'Tribal Health Care Project' are great initiatives taken by the Government of India to provide effective healthcare to indigenous peoples across the country. In addition, the 'Central Council for Research in Ayurvedic Science' (CCRAS) has launched 'Tribal Health Care Research Programme' in fourteen states. The primary focus of this programme is to prevent diseases by raising awareness among indigenous Indians.

In India, the high prevalence of MetS risk factors among indigenous peoples requires the close scrutiny by healthcare professionals and policy builders. Regular medical awareness camps need to be organized in their doorsteps. In addition, people should be given financial and social support to tackle these diseases. Beside governmental activities, the role of Non-Governmental Organizations (NGO) is also very crucial. In India, a number of NGOs are working to provide health care to indigenous populations. Thus, we need practical and preventive strategies and health awareness programs to protect the health of indigenous Indian women.

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