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Review

Health disparities in Chinese Americans with hypertension: A review

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ABSTRACT

Hypertension is a leading risk factor for stroke and cardiovascular disease in the United States. Chinese Americans have poorer control of high blood pressure than Caucasian Americans and are at higher risk for hypertension. This review presents and discusses the factors known to be associated with health disparities affecting Chinese Americans with hypertension, including biological, genetic, sociocultural and environmental factors, as well as health behaviors, and health literacy. Culturally appropriate interventions are needed to decrease racial and ethnic health disparities.

1. Introduction

Hypertension is a significant cause of morbidity and mortality, and a leading risk factor for stroke and cardiovascular disease. Overall, one in three adults in the United States has hypertension, corresponding to an estimated 67 million people [1]. In 2008, 43.9% of male deaths and 56.1% of female deaths in the US were related to hypertension [2,3], which is considered as the primary cause leading to an average of 1000 American deaths each day in 2009 [4]. Nearly seven out of every ten heart attack victims and chronic heart failure patients have high blood pressure [4]. Poor control of high blood pressure remains a critical issue for Americans, as less than half have their high blood pressure under control [5,6]. A consequence of this high prevalence is an estimated annual healthcare cost of $47.5 billion. [7]

Health disparity refers to the differences in health outcomes within a population according to ethnic/racial, demographic, social, cultural, geographical, and environmental attributes [8]. This is exemplified by the fact that racial and ethnic minority groups in the US have the highest rates of morbidity and mortality due to high blood pressure [9,10]. Chinese Americans are one of the fastest growing minority groups and the largest Asian American subgroup in the US, of those who are 66–92 years old and have hypertension, less than half have their blood pressure under control [11]. Although the prevalence of hypertension in Chinese Americans between the ages of 45 and 85 is similar to Caucasians (39 *vs.* 38%), a larger proportion of medicated Chinese Americans have uncontrolled hypertension (33 *vs.* 24% of Caucasians) [12]. The aim of this review was to examine the contributing factors to and propose intervention strategies

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for minimizing health disparities in Chinese Americans with hypertension.

2. Factors associated with health disparities in Chinese Americans with hypertension

2.1. *Genetic/biological factors*

Research has shown that compared with Caucasians, Chinese have a higher percentage of body fat for a given body mass index (BMI) [13]. Furthermore, BMI is a larger contributor to hypertension in Chinese than in Caucasian and African Americans [13], which indicates that BMI may play an important biological role in health disparities among Chinese Americans. Family history is also related to health disparities in Chinese Americans with hypertension, as a higher paternal BMI is associated with higher blood pressure in Chinese American children [14]. Moreover, 43.2% of Chinese Americans have a family history of hypertension compared with 38.8% of Caucasians. [14]

Aging is another disparate contributor to hypertension, with Chinese Americans aged 45–74 years having the lowest incidence of hypertension in the US, but the highest incidence among those aged 75–84 years, when compared with Caucasian, African, and Hispanic Americans [15]. Gender differences have also been implicated in hypertension, as women are more likely than men to develop high blood pressure after 65 years of age, but less likely when younger than 45 years [4]. However, Li and Froelicher found that among Chinese immigrants, the percentage of high blood pressure was 52% for men and 50% for women. [16]

Differences in race and ethnicity may also affect responses to antihypertensive medications. Older Chinese adults taking angiotensin-converting enzyme inhibitors are more likely to have a dry cough than Caucasians, and twice as sensitive to the effects of amlodipine [17]. Evidence suggests that the adverse effects of pharmacologic antihypertensive therapy can influence medication adherence among older Chinese Americans [18]. This may in turn contribute to health disparities in uncontrolled hypertension among Chinese Americans.

2.2. *Sociocultural factors*

Social and cultural barriers are major factors associated with health disparities in the prevention and control of hypertension [19]. Li and Froelicher found that Chinese Americans who were married had better high blood pressure control than those who lived alone or were widowed [16]. In addition, discrimination, lower educational level, and unemployment are sources of chronic stress that can facilitate the development of hypertension. Thus, social equality, social support, and family resources are crucial for Chinese Americans to reduce health disparities.

Health insurance coverage plays an important role in reducing health disparities, though it does not ensure access to equivalent healthcare resources. For example, Ahn et al. found that despite the fact that nearly 85% of Chinese Americans have health insurance coverage, including Medicaid (19%) and Medicare (15%), almost a quarter self-report their health status as poor [20]. Also, the rates for Pap smears and mammograms among Chinese American women are significantly lower than for American women as a whole [20].

Culture also plays an important role in health disparities through its influences on health beliefs, habits, and practices [21]. Chinese cultural heritage is a major factor contributing to poor hypertension medication adherence [18]. For example, Chinese immigrants perceived less benefits of antihypertensive medication, and are more likely to use Chinese herbs or visit traditional Chinese doctors for treatment of hypertension [16,22]. In addition, the majority of Chinese American elders are foreign born [23], and are more likely to live with their family, relatives, or a caregiver. This may relate to the fact that approximately 30% of Chinese Americans report experiencing cultural barriers to understanding hypertension and antihypertensive drugs [20]. Finally, the family-style sharing of meals also makes it difficult to adhere to a low-salt diet.

2.3. *Environmental factors*

Several environmental factors, including residential location, hazards and pollutants, have been implicated in racial and ethnic health disparities in hypertension [9,24,25]. For example, older Chinese Americans who live in urban areas have more healthcare resources than those who live in rural areas [19]. In one of the few studies exploring environmental effects, Lau et al. found that many hypertensive Chinese immigrants in San Francisco were living in small and single-room residences around Chinatown communities [19]. Minority neighborhoods were found to be more likely to have fewer pharmacies and fewer grocery stores with healthy foods [24].

Some of the low income and disadvantaged communities that racial and ethnic minorities tend to live in can impact healthcare and health status [9]. These minority communities face greater exposure to environmental toxins, such as industrial pollution, second-hand smoke, chemical poisoning, and pesticides [24], which may contribute to health disparities in morbidity and mortality. Finally, such hardships promote a state of chronic stress that can exacerbate health problems [26]. Thus, research should not only focus on racial differences in exposure to chronic stress, but also study racial differences in responses to chronic stress.

2.4. *Health behaviors*

A low-salt diet and regular exercise are two methods widely used to control high blood pressure [2]. Research has found that Chinese Americans are more likely to have a diet high in salt, such as monosodium glutamate, soy sauce, and salty flavorings [19]. The family priorities in Chinese culture make it difficult for children to follow a standard low-salt diet. Hence, health education for family and family caregivers is crucial for older Chinese Americans.

One of the goals of Healthy People 2020 is to promote at least 30 minutes of physical activity most days of the week among Americans [5]. Key factors to promoting physical activity include encouragement from family and friends, enjoyment of the activity and confidence in its benefits,