Hypertension: A Social Impact Disease

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Abstract: Hypertension is one of the leading problems of the worldwide public health. As the group of cardiovascular diseases is the number one killer, hypertension should be controlled even in the level of individual or country. From its genesis, social theories can explain its increasing prevalence and apply for its primary prevention. In fact, hypertension is a social-impact disease, particularly, in the globaliz world. This article demonstrates how social changes (Westernization) influence the genesis and how social awareness as well as its strategies can protect people from hypertension.

Key words: *Hypertension, social impact, social changes*

One of the most important problems in cardiovascular diseases (CVD) is hypertension. The prevalence of hypertension is very high, probably in the range of 20%-40%, in the adult population in most highly industrialized countries, such as the U.S (1,2). The risk of cardiovascular disease is linearly related to the level of both the systolic and diastolic blood pressure (3,4). Hypertension is defined by expert committee as blood pressure more than 140/90 mmHg (1,2,5). This article reminds you to its pathogenesis and risk factors. In the today; globalized world , hypertension is growing as a leading public health problem with its medical sequelae. Social changes into westernization, awareness and strategies for its primary prevention are reviewed inthis article.

Pathogenesis of Hypertension

Hypertension is a multifactorial disease. There is very strong familial aggregation of blood pressure levels that is likely due to both genetic and shared lifestyle variables (6). It is probable that a combination of genetic polymorphism (i.e., host susceptibility) and environmental and lifestyle factors, such as salt consumption and weight gain, determine blood pressure levels. These predisposing factors lead to the development of hypertension via two major pathways, cardiac output and peripheral resistance.

Risk Factors

1. Genetics
2. Environmental and Lifestyle Factors

1. Genetics

Genetic alterations may initiate the cascade to permanent hypertension. Clearly, heredity plays a role (7). In studies of twins and family members in which the degree of familial aggregation of blood pressure levels is compared with the closeness of genetic sharing, the genetic contributions have been estimated to range from 30 to 60 percent (8).

2. Environmental and Lifestyle Factors

Stress. Repetitive stress or an accentuated, exaggerated response to stress raises the activity of sympathetic nervous system. Young hypertensives tend to hyperresponsive (9). In the Framingham study, the development of hypertension over 18 to 20 years was associated with heightened anxiety and anger intensity and suppressed expression of anger at baseline (10). The Tecumseh subjects with higher plasma catecholamines also tended to have higher plasma renin activity (PRA) levels. Other studies have noted that hypertensives with high PRA had more anxiety, suppressed anger, and susceptibility to emotional distress (11).

Diet. The most likely agent of this common kind is salt consumption (6,12). Restriction in sodium chloride (i.e., from about 10 g to 4 g) will result in a population average of a 6-7 mmHg decrease in systolic blood pressure and a 3-4 mmHg decrease in diastolic blood pressure (13). Most recently, the Dietary Approaches to Stop Hypertension (DASH) II study (14) documented, in a well-controlled, short-term feeding experiment, that salt restriction decreased blood pressure levels independently of weight loss or changes in other important nutrients. Further modification of other nutrients, such as increasing potassium and reducing fat intake, as well as decreasing the prevalence of obesity, especially weight gain through young adult life, and decreasing high levels of alcohol consumption, may enhance the benefits of lower salt intake. These will provide an efficacious nonpharmacologic approach to prevent the rise in blood pressure with increasing age and the subsequent development of hypertension and clinical cardiovascular disease (15).

Obesity. Obesity is defined as body mass index over 30. People with obesity experience increase risk of developing hypertension and subsequent ischemic heart disease. In the Framingham offspring study, adiposity, as measured by subscapular skinfold thickness, was the major controllable contributor to hypertension (16). Children are vulnerable to the hypertensive effects of weight gain (17). Therefore, avoidance of childhood obesity should intervene to prevent hypertension.

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Physical Inactivity. Physical fitness may help prevent hypertension, and hypertensive persons may lower their blood pressure by means of regular isotonic exercise. The pathway may involve insulin resistance, because increased resistance was coupled with low physical fitness in normotensive men with a family history of hypertension (18). Regular exercise may prevent hypertension and thereby protect against the development of cardiovascular disease (19). In a study with 16,936 Harvard male alumni followed for 16 to 50 years, those who did not engage in vigorous sports were at 35 percent greater risk for developing hypertension, whether or not they had higher blood pressures while at Harvard, a family history of hypertension, or obesity-factors (20).

Alcohol Intake. Alcohol in small amounts (less than two reguler serves a day) provides protection from coronary mortality (21) and atherosclerosis (22) but in larger amounts increases blood pressure (23) and overall mortality (21). Large amounts of alcohol provide pressor effect, leading to an increase in cardiac output and heart rate, via an increase in sympathetic nerve activity (24).

Smoking. Cigarette smoking raises blood pressure, probably through the nicotine-induced release of norepinephrine from adrenergic nerve endings.

Social Changes Accounting for Risk Factors of Hypertension

Genetic Selection

McElroy and Townsend (25) review and note that while hypertension is found among 15 percent of white adults, the rate is 28 percent among African American adults. Consequently, hypertension is the number one health problem of African Americans. Thomas Wilson and Clarence Grim,(26) at the Hypertension Research Center of Drew University, point out that the reason is salt-retaining efficacy of the kidneys. African Americans tend to retain salt far longer than whites before secreting it into the urine. Moreover, blood pressure in African Americans is more sensitive to immediate salt intake, rising or falling in direct relationship to changes in dietary salt levels. Those support the appearance of genetic differences in how the kidneys of whites and African Americans process dietary salt with health consequences, most notably a hypertension rate among African Americans that is almost double that of whites. Grim and Wilson (26) may explain why African Americans have been selected for having efficient salt-retaining kidneys? **First,** forced marches to export sites along the African coast and toil in a blazing sun in plantation fields would have contributed to significant salt loss and a resulting high rate of death among slaves. **Second,** one of the most common causes of death among slaves during the trans-Atlantic passage was diarrhea, leading to dehydration from a sudden loss of large quantities of salt and water. Around 70% of the individuals who were originally captured in Africa were dead within four years. Those may be the reason why salt-retaining kidneys offered a significant survival advantage and, to the degree that this trait was genetically determined, passed it along to the next generation. This genetic selection leads to the high rate of hypertension and associated disorders among African Americans who appear to be less sodium tolerant than whites.

Environmental and Lifestyle Risks

Industrialization, urbanization, and international migration are processes with short- and long-term effects on the environment, as well as repercussion on the morbidity and mortality profiles. Declining mortality levels were correlated with a shift in the causes of disease and death: from infectious diseases, malnutrition and poor reproductive health to rising chronic and degenerative diseases (epidemiologic transition). Towards the early 1970s, sedentarism, diets rich in animal fat, smoking and alcohol abuse lead to emergence of non-communicable disease. Cardiovascular disease (CVD) was increasingly presented as a product of lifestyle changes. At the turn of the 21st century, the primary cause of death and disability in industrialized nations is CVD. Based on current estimates, by the year 2020, CVD will be the primary cause of death worldwide, as the living standards of the developing nations rise and their populations adopt the "Western lifestyle." It is well known what the unhealthy elements of this lifestyle are: too much food (especially fats and saturated fats) and too little exercise, leading to the increasing risks of hypertension.

Obesity. The global epidemic of obesity is also emerging as a worldwide problem. Its growing rate is so astonishing. The problem is escalating on every continent, not just North America. Obesity affects the lives, of more than 1 of every 2 American adults. It is the second leading cause of preventable deaths in the United States (surpassed only by smoking), responsible for nearly 300,000 preventable deaths a year. Obesity is also found in 1 of every 10 children and adolescents, who are at higher risk of becoming obese adults.

Since the 1960s, the rates of obesity have been climbing . Within the last decade alone, there has been about a 60% increase in the number of obese Americans (more women than men). It is estimated that 22% of the adult American population is obese, and if the rate continues to grow, it is projected to affect 40% of the population by 2030. This observation is the result of an unintended consequence of the economic, social, and technologic changes of American society. Increased food consumption, coupled with labor-saving technologies that have virtually eliminated the requirements for physical activity in everyday life, have led to the rise in obesity.

Another reason is that there is a decrease in levels of physical activity as a society moves toward industrialization, and a subsequent increase in calorie-dense foods; in conjunction with this, there is usually a greater increase in salt intake secondary to the use of processed foods. Obesity and high salt intake contribute to an increase in the prevalence of hypertension and later, in some populations, diabetes, atherosclerosis, coronary heart disease, and stroke.

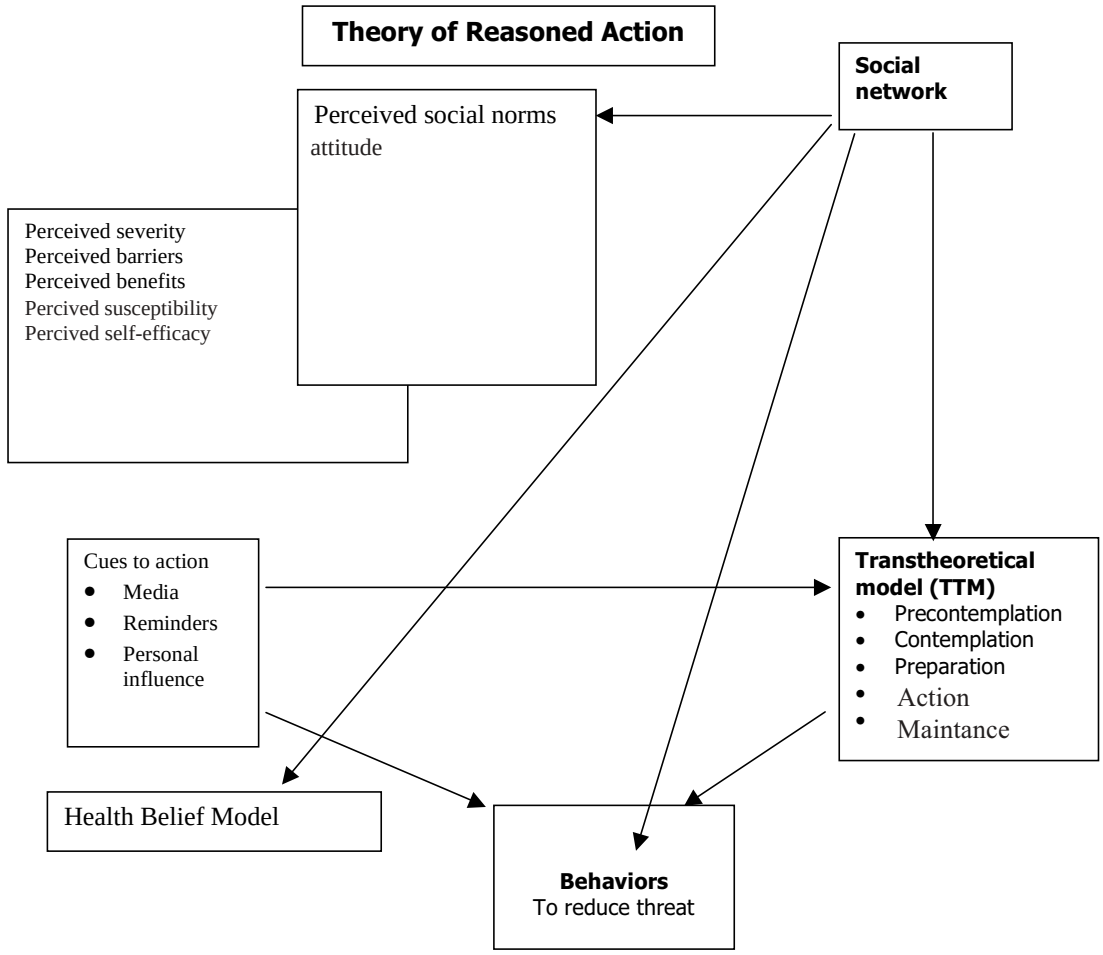

Figure 1. Demonstrates how social theories should be applied to modify behaviors as primary prevention of hypertension.

Exercise. Improved technologies, industrialization and urbanization lead to sedentary lifestyle as well as increased prevalence of hypertension. It is recognized that there is a direct dose-response curve to this type of exercise such that benefits increase as the duration, frequency, and exertion of the exercise increases. In general, people of all ages can improve the quality of their lives and reduce the comorbid risks associated with obesity and hypertension through a lifelong practice of moderate physical activity.

Stress. In the today's busy world , people, particularly children face more competitions in their livings which cause stress. Complicated lives will influence health via sympathetic nervous system activity. Indirectly, people compensate their stress by self-injurious behavior, such as drinking alcohol, smoking, and overeating to reduce stress, lead to increasled the chance of developing hypertension.

Every effort should be paid to influence and guide people to what are the desired behaviors (Table 1) to prevent hypertension. As the demonstrated model, social theories, in fact, relate and affect each other to lead the behavioral changes. First, any susceptible host should be identified (genetic susceptibility). Social networks should promote and distribute healthy social norms via cues to action. Attitude of healthy behaviurs should be installed since childhood. Every social process to drive behavioral changes in every stage of TTM should be reinforced. Finally, all interventions should be continued lifelong.

Table I. Lifestyle modifications for hypertension prevention and management (1).

• Lose weight if overweight.
• Limit alcohol intake to no more than 1 Oz. (30 ml.) ethanol (e.g. 24 Oz. Beer, 10 Oz, Wine, or 2 Oz.100-proof whiskey) per day or 0.5 Oz. Ethanol per day for women and lighter weight people.
• Increase aerobic physical activity (30 to 45 minutes most days of the week).
• Reduce sodium intake to no more than 100 mmol per day (2.4 g.sodium or 6 g. sodium chloride).
• Maintain adequate intake of dietary potassium (approximately 90 mmol per day).
• Maintain adequate intake of dietary calcium and magnesium for general health.
• Stop smoking and reduce intake of dietary saturated fat and cholesterol for overall cardiovascular health.

Social Planning

Incorporate into interventions the constructs that influences on behavior, such as beliefs, perceived health threat, cues, self-efficacy, attitude, subjective norms, intention and stages of change.

Clearly define these variables.

Consider the organizational context and include factors in the work environment most likely to maximize effectiveness. These would include communication, participation, active involvement of organizational leaders, fairness, mutuality, respect, and external and internal reinforcers.

Use the stages of change as a step to assess individual and group readiness before selecting any interventions.

Use a planning framework to track various components and processes in an ongoing evaluation of the effectiveness of interventions.

Consider a multidimensional intervention to have a greater impact on behavior.

Use words that promote a sense of active participation and internalization (e.g., "enhancing practice").

Social Network, Theory of Reasoned Action and Health belief Model : Strategies to Prevention

Facing with hypertension requires interventions at several levels: policy, education (of both the public and health care providers), and incorporation of a team approach to patient care that involves dietitians and health educators. **Organizing a social network, creating healthy social norms, and using every media to set people's perceptions of the desired lifestyles, should be reinforced (Figure 1)**. More vigorous physical activity in schools, and more emphasis on healthy diets should be encouraged.

To achieve desirable lifestyles, modification of healthy behavior is a key (Table 1). If this advice can be delivered to patients on an individual basis, success is greater.

Transtheoretical Model

By Transtheoretical medication, the physician's task is to recognize which stage the patient is in and respond accordingly. Difficulties in treatment arise when the physician and the patient are at different stages and therefore do not share mutual goals. As a result, there is a failure to communicate and be understood.

In the first stage, precontemplation, the patient has no intention to change the problem behavior. This may be due to lack of awareness that the behavior is negatively influencing health. Thus, an acknowledgement by the patient that a problem exists is required. This is the stage of contemplation. The patient becomes aware of the problem behavior and seriously considers change but does not yet make a commitment to do so. This is the stage when the physician can advise the patient about what techniques and skills are going to be required to make a change. Preparation, the next stage, occurs when the patient commits to make a change. This is followed by the action stage, when the learned skills that will result in change are implemented. In this stage, the patient modifies her behavior, experiences, or environment in order to overcome the problem behavior. This also is the stage that requires a commitment of time, energy, and resources.

The last stage is maintenance. During this stage, the individual must work to prevent relapse. Movement along the continuum of these stages is no always ordered, nor does it occur in a timely sequence. Rather, individuals may move along 1 or 2 stages, lapse back to a previous stage, or get stuck in a particular one. The last behavioral stage occurs when the lifestyle change is maintained and permanently in place.

Summary

Industrialization and urbanization with labor-saving technologies are leading to increase the prevalence of hypertension. As a multifactorial disease, hypertension prevention should focus on every risk factor. Social planning, interventions and networks should be implemented to control this disease even in the level of individual, society, country or inter-continental. With better knowledge and awareness of this harmful disease, we hope that, someday, we can control hypertension and its cardiovascular consequences.

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