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REVIEW ARTICLE

Effect of Tea, Coffee, Milk, Beer, Wine, Alcohol, Soft Drink, Junk Food and Smoking on Blood Pressure: A Systematic Review

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ABSTRACT

Introduction: Intrinsic Physiological Regulatory mechanism bring back blood pressure to normality due to change in external environmental and internal physiological activities perform to maintain life by getting food, shelter, security etc in day to life till the survival. Recent advances in society change the basic pattern of livelihood and reduced the day to day activities by changing work format, increasing the sedentary life activities and introduction of artificial sweetener, preservatives for food items, different form of alcoholic non-alcoholic beverages etc. All these new entrees in the food habits and reduced physical activities dampen the regulatory mechanism. Consequently altered the reset the normal blood pressure to the higher level. This high range in long run keep damaging the vital organs and increase cardiovascular mortality as well as morbidity.

1. Blood pressure alleviating effect of tea is due to its metabolites which has been proven. On the other hand, coffee intake have no effect on the Blood Pressure on moderate consumption while it increases in higher amount per day Since Milk is the integral component of both tea and coffee in the many parts of the world, so its properties of reducing Blood Pressure due to smaller peptides produced by gut bacteria should not be ignored while evaluating the effect of tea and coffee on Hypertension.

2. Alcohol causes hypertension by different mechanism so all those beverage like beer and wine which are not pure spirit but have smaller content of it, are also implicated in Hypertension despite older believe in society that says –"Wine is good for heart".

3. Young generation is fast and synonymous to fast food such as pizza, burger, fries, chips, cake soft drink etc. High salt, sugar and preservative are the ingredients in it which shoot the blood pressure. Thus, they are the main factors of hypertension among children and youth of the society.

4. Smoking is another factor among large population of youth and adults which fall prey to the addiction of it due to style statement and fashion of smoking in the peers which cause increase in blood pressure mainly due to sympathetic drive.

Conclusion: This feeding behaviour along with poor physical activity of modern society collectively weaken intrinsic regulatory mechanism, alter the physiological activities of cardiovascular system and set the blood pressure at the new high normal. Persistent high level of BP leads to generation of primary type of hypertension at early stage and on long run give birth to secondary hypertension as well as damage to the vital organs such as Kidney, Retina. cerebral vasculature of Brain and coronary circulation and musculature of Heart.

Keywords: Primary Hypertension, Secondary Hypertension, Blood Pressure, Intrinsic regulatory mechanism, Mortality and Morbidity.

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INTRODUCTION

Blood Pressure is a hemodynamic parameter of body that change with every heartbeat. It depends on whether person is lying clam or worried about something, having discussion or argument with someone, doing exercise or fighting with others and suffering from depression or overexcited for nothing. Frequent change in the blood pressure according to varying situation is survival tactic adopted by the human body though the evolution. These changes are beneficial for survival of human beings. Altered blood pressure quickly return to the normality

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as external conditions are disappear. But, it is seen that sustained altered situations lead to persistent increase in blood pressure that keep going up and up and set to high normal. Progressive high normal BP start destroying the delicate organ of the body such as kidney, retina, brain even to the heart. This daily change in the environmental factors as well as persistent change in the eating behaviour such as dietary habit of consuming tea or coffee in the morning, taking soft drinks along with fast food when we are out for work during daytime and smoking, chewing tobacco to drink alcohol during night time when accompany friends in the party or due to peer pressure at official parties and social gatherings.

Meta-Analysis of the individual components have very little or negligible effect on the blood pressure and human body compensate this little change by intrinsic physiological regulatory mechanism and thus keep the pressure within the normal limit and protect delicate vital organs. But whenever such eating and drinking are adopted in our daily life with sustain and continuous manner then the high normal blood pressure change to high blood pressure. At this point, intrinsic regulatory mechanism exhaust to bring back normal blood pressure. Thus, normal level change to the high normal and finally high blood pressure

Effect of Tea

When the morning begin with tea is definitely increase mental alertness and its metabolites help relax smooth muscle by increasing nitrous oxide synthesis .Other metabolite seems reducing inflammation and oxidative stress. The polyphenolic compounds called flavonoids which is richly present in tea and it not only lower blood pressure but also help improve cognition among old generation who frequently drink it per day. Polyphenolic compounds of Oolong tea is known as catechins . Who drinks at least 120 mL/day (half a cup) of moderate-strength green or oolong tea for a year, had a 46% lower risk of developing hypertension than those 120 to 599 mL/day (two and a half cups), the risk of high blood pressure was reduced by 65%. They concluded that habitual moderate-strength green or oolong tea is positive for hemodynamic of body. In another study, it is being observed that consumption of Camellia Sinens is in capsule form twice a day for three weeks lowered SBP by 5 and DBP by 4 respectively.[1]

Effect of Coffee

While taking coffee instead of tea has inverse relation on the blood pressure which on regular consumption of 200-300 mg caffeine produced a mean increase of 8.1 mm Hg (95% CI: 5.7, 10.6 mm Hg) in systolic BP and of 5.7 mm Hg (95% CI: 4.1, 7.4 mm Hg) in diastolic BP. In the hypertensive patients, thee increase in BP was observed in the first hour after caffeine intake and lasted ≥3 hrs. In 3 studies of the longer-term effect (2 wks.) of coffee, no increase in BP was observed after coffee was compared with a caffeine-free diet or was compared with decaffeinated coffee. Last, 7 cohort studies found no evidence of an association between habitual coffee consumption and a higher risk of CVD.[2] While in the apparently healthy person, temporary increase in blood pressure returned to normal due to both kidney elimination of caffeine along with physiological regulatory response. Habituation or adaptation in healthy person is due to these factors. Thus, there is ambiguity of result in two set of individuals-healthy and hypertensive. It seems there are various factors which have been ignored such as age, sex genetic predisposal and life style. Evaluation of daily caffeine intake in both group along with other beverage such as Tea have not been evaluated. Daily Blood pressure measurement of subject can also be faulty if taken by different instruments.

Confounding factors and method of study can also be implicated in contradictory results.[3]

Study conducted between 2010 to 2016 showed the result which stated that if coffee is consumed in moderation among patients of various cardiovascular illness and even in diabetics, seems safer.[4]Persistent study on coffee and its effect on mankind is due to continuous high consumption of it worldwide and growing cases of primary hypertension in the society. Which later on turned into prime factor of secondary illness such as diabetic and other cardiovascular defects. Further, recent studies have concluded more than hundred chemicals in coffee which have both positive and negative effects.[6] It also explain regular and moderate amount is safe on primary hypertension but occasional intake will surely increase blood pressure. Moderate consumption is also very vague in terms of quantity as the height, weight, age of person and his physical activity are other compounding factors which varies in all the person.[7]

Effect of Milk

In, India, milk is almost always adulterated with Tea and Coffee, so it's separate effect on blood pressure should also be studied to explain the impact of tea and coffee in the healthy and hypertensive patients. Various epidemiological studies have shown that not only milk but dairy protein also have blood pressure lowering effect. Presence of gut flora specially lactobacilli which have capability to breakdown milk protein into smaller milk peptide.

These several milk peptides perform antihypertensive role by inhibiting Angiotensin-

converting enzyme as well as opioid like activities. Thus, it shows the antihypertensive role if it is mixed with tea of coffee.[8] Exact mechanism and exact component that involved are still not well understood and left further scope of study.

Effect of Beer, Wine and Alcohol

Common believe amongpeople stated that moderate beer and red wine consumption have potential to reduce blood pressure and good for heart though if contain little alcohol. Many studies are in favour of wine that reiterated wine consumption among diabetics reduce blood pressure specially diastolic by reducing end diastolic volume not cardiovascular risk. However, the factors and mechanism is different.[9]

Alcohol consumption and increment in blood pressure is well established while other alcoholic beverages such as beer and wine is ambiguous but this is due to presence of other factors along with alcohol. Four weeks interventional study where one group as a control-abstinence and other group with similar consumption of red wine (375 mL; 39 grams alcohol), de-alcoholised red wine (375 mL), or beer (1125 mL; 41 grams alcohol)was done. Ambulatory systolic BP, diastolic BP and heart rate along with vascular health is evaluated.

SBP, DBP and HR remain normal in non-alcoholic red wine similarly no effect on vascular health. While beer and red wine which contain alcohol have potential to increase SBP and HR. Thus, polyphenolic compound present in red wine have not significant effect in lowering of blood pressure caused by alcoholic content.[10]

Effect of Soft Drink

Next most popular drink after hot tea and coffee is soft drinks as a welcome drink world-wide. Studies have proven its link in raising systolic and diastolic blood pressure among long term users. Stronger association of hypertension is notated in hypertensive than non-hypertensive. A cohort study of 14 years among 1324 adult health workers showed result of 2.08 mm Hg (95% CI: 0.21, 3.94) increase in systolic blood pressure and 2.09 mm Hg (95% CI: 0.81, 3.36) increase in diastolic blood pressure over ten years. While in the same study, non-caloric soft drinks showed no association with hypertension.[11]In further studies, especially in a meta-analysis dose response of sugar sweetened verse artificial sweetened drinks also implicated them in hypertension as well as diabetics and obesity.[12] Another study among 574 adolescents of 20 public schools also showed positive link between soda drinks and raised systolic and diastolic blood pressure.[13]

Effect of Junk Food

Junk food such as pizza, burger, fries, chips etc are close companion to soft drinks and hot coffee at the restaurants in the small and big cites. Its consumers belong to all age group specially college going and frequent travellers due to its easy to carry and easy to eat.

Large group study among 14880 students concluded with affirmative result showing increment in systolic and diastolic blood pressure irrespective of the type of junk food they consumed. In each type, either here is high sugar contents or high salt content along with preservatives that have their own side effect.[14]

Effect of smoking

Smoking among young men and women start with style statement among their peers and later on they become physically and psychologically dependent. It is the most power full agent which causes arterial wall thickening, inflammation, impairment in endothelial membrane as well as sympathetic stimulation which in turn lead to increase in systolic and diastolic blood pressure. This primary cause give birth to secondary hypertension of renovascular origin and server malignant hypertension.[15] A person and family who accompany the chronic smoker are equally at risk due to second hand smoke exposer. Such passive smokers are turn hypertensive and develop end organ damage[16].

CONCLUSION

Transient change in Blood pressure is not only the function of physiological changes but also of food habits we adopted in our daily life. Tea consumption on regular basis help reduce blood pressure while coffee consumption has ambiguity in its result . Like tea, milk has clear positive role in controlling blood pressure though mechanism is not well understood. Beer, wine and Alcohol have blood pressure elevating properties in both short term and long term.

Soft drink and junk food having soda, sweeteners and preservative which increase blood pressure and make its consumer inclined and addicted. Smoking as a style statement among youth trap and make them addicted which not only affect them but also to those living nearby to them through hypertension as well as end organ damage .Although, our intrinsic physiological regulatory mechanism tries to deal with and brings blood pressure back to normal yet sustained psychological, behavioural, and dietary pattern for longer time alter the regulatory efforts. As a result, we suffer different lifestyle disease such as primary hypertension where SBP and DBP change to higher levels where as diabetics cause insulin resistance. These together slowly deteriorate the vital organs in due course of time and results in poor quality of life among suffers. In nutshell, mass awareness and food polices by institutions and its recommendation among population should be imposed to reduce the burden of hypertension and its ill effects among society.

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