

Can Diet Reverse Ageing? Diet and Ageing: Role and Relation

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ABSTRACT

Background: For health, clean air, oxygen, water, sunshine, exercise, sleep and nutrition are essential. But simultaneously the reactions and metabolism inside the body produce energy and carry out the work required to sustain life, family, and society. With time comes ageing, a phenomenon which while is good because of the experiences that we gain, but also has a dark and attrition side of it. This study underscores if diet can reverse the detrimental effects of ageing like free radical and oxidative stress mechanism with antioxidants, mutations in DNA and RNA which lead to cancer with a diet that can correct such adverse reactions, the lack of immune response as in HIV and AIDS with immune boosting foods which can increase our CD4 counts, the covid pandemic has aftermath in having heart related problems and increased susceptibility to flu like symptoms and how diet can circumvent and stand up to face such challenges, the non communicable disease epidemic like diabetes, heart diseases, hypertension and how diet can cure these long lasting diseases.

Method: A group of 200 volunteers were chosen as per judgment and convenience basis for the study. They were followed by multiple rounds of interviews and dietary counseling over one year based on latest medical knowledge of metabolism, pathways and principles. Participants were free to consult their respective physician for treatment and advice this study focused on proximate dietary principles to bring about positive change in disease outlook. Investigations were followed up and general well being assessed clinically.

Result: No sugar diet brings a remarkable change in diabetes, heart diseases, chronic kidney diseases, high cholesterol and reduces the risk for complications like diabetic ketoacidosis, acute myocardial infarction. Salt restricted diet improves heart disease, hypertension. Decreased oil consumption, and no trans-fat, hydrogenated fat decreases palpitations, weakness, heart problems Anemia is improved and cured by eating vitamin C rich foods, ferritin, iron containing foods, Vitamin B12 rich, and folic acid rich foods. Sunshine and vitamin D, calcium and phosphorus remarkably improve strength of bone and relieves aches and pains such as arthritic pain. Fruits and vegetables when consumed fresh reverses ageing, tightens wrinkled skin. Milk and dairy products along with vitamin A rich foods like papaya, carrot, pumpkin, improve vision in elderly.

Dehydration is cured, vomiting relieved, and bladder movements are improved by soups, vegetables, regular water intake, lemonade, hot rice and lentils. Bowel habits get regular with including roughage and fiber containing foods and fruits and vegetables and having clean portable water to drink. Having lots of onions, eggs, fenugreek seeds, curry leaves, fish in diet and delay graying of hair due to age. Including fish, goat meat, chicken, eggs, milk in diet improves overall general well being and lots of chronic health issues like heart diseases, kidney problems, diabetes, immune loss.

Conclusion: Diet has a major role to play in controlling diseases like diabetes, hypertension, alcoholism, hyperlipidemia, kidney disease, lack of immunity, vision problems, strength, stooped posture and bone related problems, body aches and pain, depression, mental agility, happiness and activity. It may in fact reverse the process of ageing and help to live longer, more productive happier life. It is said that gut is the second brain. Micro biota in the gut play role in digestion of food, regulate immune system, protect against microbes and infection, produce vitamin B1, B2, B12, K, help extract energy from nutrients, generate metabolites which affect several organ systems.

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Ageing is a phenomenon every individual must go through in life. As adult we work hard to build house, family, and relations to secure our future. But life has flip side too. Frailty, disease, old age, death is unavoidable part of life. With COVID pandemic the world has witnessed another scourge of terror beyond bioterrorism and atomic power. The aftermath is still being discovered. Depression, memory loss, heart problems, chronic kidney disease, cancer are some of the other illnesses that strike with advancing age.

Diabetes, hypertension, fatigue are endemic in all parts of the world. In this study we discuss some common problems and their solutions that afflict with age. Middle age, especially after fifty sees a sudden shift in health on the downside. Primordial prevention is best; a stitch in time saves nine. This ensures we take care of our daily routine, stressors, diet, exercise, any risk factor and be careful of the minutest possibility such that disease can never set in. Primary prevention is better. This is the state in which the disease has not set in, we prevent by taking vaccine, vitamins, minerals, yoga.

We age, with each passing day, with everyday battles and struggle for survival, unaware of the stresses we are incurring, fast food diet or lack of proper nutrition that we are at times forced to undergo to meet commitments and deadlines to meet the fast pace of life. Some lifestyle diseases like depression, diabetes, obesity, heart diseases, renal issues, and hypertension catch us amidst these stresses and strains of life. There is long term medication for each of these diseases. We go to our doctor and get a refill of medicines that must be taken along with regular tests and checkups. Medical science has progressed in robotic science, in nanotechnology, precision medicine, and digital health care. While food is important, love, communication, respect, attention, care also play a role in health and fitness. It is not just what you eat but also how it is served to elderly, vibes along with that cook food is transferred to the person along with energy.

This study undermines the extent to which diet can address secondary prevention. Diet modification, change from fried stuff to boiled foods, using fresh meat and fish instead of processed and packaged meat and fish, home cooked and ambience instead of buying ready to eat food items can alter the pattern of ageing and coupled with exercise and lifestyle modification can reduce the burden of disease. This study was undertaken to assess the role of diet and nutrition in causing and removing chronic problems of geriatric age group and some possible solution to address them.

Method

Study was conducted in the community among known people who were suffering from some or the other complaints. Participants were being individually treated by their respective doctors according to their area of complain. Voluntary participation of subjects, Convenience sampling method, and judgment based, was the mode of recruitment of study subjects. Period of study was 3 years. Study design was cross sectional case control study. Type of study was descriptive and analytical. Sample size was 200 patients. Study was analyzing role of dietary modification for the complaints relate heart diseases, as suggested by the EKG, echo or other reports, kidney diseases, mostly diabetes related nephropathy, or chronic kidney disease, follow up of reports, gastritis, digestion problems, swallowing, diet related problems, bloating and acidity which is common with ageing.

Data was collected by questionnaire method of interview. 24 hour Diet chart was recorded every 3 months for 1 year. Any travel diet or frequent change of diet was asked and recorded. Drinking, coffee, tea, alcohol, beverages, cigarette were noted. Erratic diet was asked and recorded. Any particular change of diet was asked and recorded. Drugs and medicines were taken note of.

Some nutrition related measures that were analyzed. Calorific value of food, nutrition coefficient, Specific Dynamic Action, Physical Activity of Living, net protein utilization, recommended daily intake of nutrients were used for analysis and advice. Calorific value of food is energy density or energy yield per unit weight of food. Respiratory quotient is defined as the ratio of volume of carbon dioxide produced in L/g to the oxygen consumed in L/g. RQ of carbohydrates is 1, RQ of fats is 0.7, RQ of protein is 0.8. Basal metabolic rate (BMR) is the energy necessary to sustain vital functions like cardiac function, brain function, breathing and respiration in a state of complete physical and mental rest. BMR is not the same as energy expenditure when a man is asleep. Sleep has lower energy consumption than when body is awake but at rest. Factors affecting BMR are temperature, exercise, age, sex, diet, fever. Body Mass Index (BMI) is weight of a person in kg divided

by height in meter squared, Waist circumference was taken at 4 visits as abdominal girth or visceral fat is a measure of adiposity.

Any particular change of diet was asked and recorded. Stressors or trigger were noted. Drugs and medicines were taken note of. Clinical signs and symptoms of patient complaints were evaluated and diet modification advised. Investigations on blood parameters were recorded and dietary advice given. Some interventions that were applied to diet modification with respect to precision medicine and personalized care were –General dietary advice as to a healthy, palatable, easy to cook, within budget, balanced diet and specific nutrient requirement based on individual's dietary habits were advised. For psychological factors in elderly -Soft semi solid and liquid diet, palatable, appetizing diet, tender loving care. Diet with patients with heart disease -Replace saturated fats with vegetables (oils) and fish (oils), decrease LDL, VLDL TG, decrease HDL, include Omega 3 fatty acids in diet, remove trans fats like cookies, cakes, bakery products, fried ready to eat foods, fast foods that adversely affect endothelial function and aggravate insulin resistance, restricted salt intake, restricted water intake. Diet modification for obesity included a low calorie diet which is based on the principle of balanced diet. Calorie restricted diet and regular exercise.

For kidney related problems a diet rich in protein with meat, eggs, chicken, fish is recommended. No sugar diet is always a good idea in diet correction. Diabetes or uncontrolled blood sugar is the reason for chronic kidney diseases, atheromatous vascular disease, coronary heart disease, decreasing immune strength and also a lot of cancers. It is prudent to replace sugar with healthy sources of protein like boiled prawns and sea foods or natural supplement for sweet like dates, sweet potatoes, carrots, and apples.

Sugar consumption in terms of sweets and table sugar were reduced or curtailed. Salt intake reduced to no added salt on toppings other than that required for cooking meals.

Eat sumptuous meal in breakfast and moderately at lunch. Eat less at supper and little at dinner. This strategy was advised for a healthy diet plan. Periodic fasting which some people follow was respected idea as a good thing. It was neither advocated nor denied. Ketogenic diet was not advocated and the pros and cons were not studied in this research. Tea, coffee, beverages, cola, soda, diet coke, alcohol, red wine were also not studied in this research study and they are generally not encouraged for healthy diet in elderly.

Results

Investigations showed decreased folic acid, vitamin B12, ferritin, vitamin D in some participants. Dietary advice for regarding readily available food, cereal, grain, vegetable, fruits, salad, fish, egg, prawn, meat, chicken were advised according to culture and diversity. Nourishment is suboptimal with ageing. Reason being caries, dental problems, hard food, swallowing difficulty, depression, mental low mood, stress at work, unpalatable food, food not suited to taste and prior liking, change of habitual eating habits, shift of work place, adjusting to new climate, culture, family pressure, neglect. Gastritis related problems -heartburn, bloating, flatulence, nausea was common with ageing especially if unaware of one's digestive pattern and individual predispositions. Different types of oils, refined oil, mustard oil, ghee, butter, in one meal for preparing one meal or different items of same meal was one reason. Stress, weather, COVID pandemic has considerably altered the eating pattern and diet and affected ageing. Vegan diet

is one cause for lack of nutrients and loss of immunity due to lack of the variety of food and protein, mineral, vitamin sources from animal proteins. Incessant work, travel jobs, pressure at work and or home, Lack of sleep or insomnia common in elderly because of family issues that contribute to ageing is reversible upon removing the stressors and improving diet and sleep. Stress and work pressure, travel, pressure of high output performance are high in the list for lack of sleep. Allergy to sea food, prawns, lobster crab is common. That needs to be identified and advised to stop. Secondary Lactose intolerance is common in adults where the enzyme lactase become progressively deficient with advancing age and then they find it difficult to digest dairy or dairy products. One easy solution is to use cardamom which aids in digestion and helps relieve bloating, flatulence, others include diluting milk, replacement of milk with non dairy products, curd contain lactobacillus which provides lactase enzyme by acting upon gut flora. Small frequent meals, bland boiled foods stuff without a mix of oil and ghee helps relieve gastritis to some extent. Change of place, weather, people, lifestyle, food habits, culture, and food markets all affect the nutrition of elderly.

A general advice is to include boiled vegetables, cereal, soups, dals, lentils, enough in portion size, volume, quantity, quality, variety and enough proteins - eggs, milk, meat, fish, and milk.

The psychological aspect is as much a factor. It is important not to disdain them, not to belittle them, if they waste food on the plate, it's not necessary that they are wasting; it may actually mean they are unable to eat that food at that time. To serve food with love respect and dignity matters as much as the food itself on occasions! It is prudent not to look down on them because they can't cook their food, or break glassware because of frailty and age. Understanding is key.

Tight skin, free from wrinkles with collagen forming vitamin C, zinc, copper which is a cofactor for lysyl oxidase enzyme involved in cross linking collagen fibers of skin Dark hair color with natural herbal remedies and nutrition like onions, eggs, curry leaves, included in diet. Difference in hair growth and volume is evident in 3 month time. at the same time poor diet, devoid of nutrients, stale, ready to eat food have a distinct effect in 6 months with

Patients with heart disease, heart related symptoms were subjected to cardiac diet. There was a distinct change in Lipid profile. Walking increased HDL cholesterol, zero trans fats and less saturated fat, fish diet, meat, eggs, milk increase, Omega 3 fats, PUFA: MUFA 1:1 in diet decreased total cholesterol, LDL, VLDL, and TG. Angular stomatitis, cheilosis, glossitis improve with vitamin B2 containing food, milk, egg, meat, fish. Bleeding gums, swollen jaws, bleeding from nose, clots underneath skin improve with vitamin C rich diet, green chili peppers and citrus fruits, lemon, Orange. Vision improves with vitamin A rich foods, like carrots, pumpkin, and papaya. Vitamin D rich sources are eggs, meat, chicken, fish and milk. But the advice that simultaneous sun exposure for brief periods is beneficial has to be spread. Similarly calcium and phosphorous also needs to be added to counter osteoporosis and osteomalacia. Salad is rich source of fiber and helps regulate bowel movements. Constipation is relieved with enough water intake and fiber rich fruit and vegetables. Diarrhea and constipation are very common nowadays especially in elderly. Slight irregularities in diet signify weakness in body immunity and irregular bowel movements. Especially for elderly it is difficult to resist the urge for defecation and urination as the muscles become weak and sympathetic and parasympathetic control is less. So customized house with elderly proofing in bathroom, like

attached bedroom and bathroom. Customized modular kitchen for easy work all make a difference in quality of eating and living.

One way to flush out toxins from body is to exercise and sweat it out. Packed, packaged, ready to eat, on the go, frozen food have less nutrients, fast foods, fried, reused oil, margarine, hydrogenated vegetable oil that are commercially used in food preparation increase shelf life of food but they are injurious to health as they disrupt the endothelial lining of blood vessels, this leads to plaque formation, and atherosclerosis. Fresh hot food has long been known to be healthy. No sugar diet for one week can bring a visible improvement in kidney function in chronic kidney disease or diabetic nephropathy. No sugar, no refined carbohydrates like refined flour (maida or all purpose flour), no refined oil, such as ingredients used for baking cakes, if curtailed from diet can be replaced by healthy choices like fish, chicken, goat curry, vegetables and show visible improvement in kidney function tests and blood sugar fasting and post prandial levels as well as better control on random blood sugar levels and HbA1C levels which tests the 2-3 months No Salt diet for 10 days can bring a noticeable improvement in hypertension, be it primary, secondary or pulmonary hypertension in mild to moderate cases.

Requirements for vitamin C in elderly is increased to 100mg / day, recommended daily allowance (RDA) for adults is 75mg/ day. Mega doses of vitamin C have been recommended for infection prevention. Ageing process is prevented by mega doses of vitamin C. Vitamin C intake has been linked to reduced risk for cancer. They improve immunity by antibody formation. Vitamin C acts as antioxidant helps retard process of ageing. Vitamin C deficiency causes microcytic hypochromic anemia. Vitamin C reduces ferric to ferrous ion and helps absorption of iron. It reduces methemoglobin to hemoglobin and helps in oxygen transport. It reduces folic acid to tetrahydrofolic acid and maturation of RBC. It helps in formation of serotonin, the feel good hormone. Vitamin C is found in lens of eye. It helps to prevent cataract formation.

Conclusion

Diabetes was known to be cured by porcine insulin or pork meat. That is how discovery of insulin protein occurred and commercial application of insulin for treatment of diabetes started off. The omega 3 fatty acids from fish oils decrease the LDL and VLDL and decrease coronary artery disease while Trans fatty acids adversely affect endothelial function and increase insulin resistance and diabetes. They are used in the food industry for high shelf life and are high in processed foods, bakery products, where hydrogenated vegetable oils are used for cooking. For example sea foods like boiled and salted crabs, lobsters, prawns are very healthy source of proteins and minerals but biscuits, cookies, cakes which use trans fats and hydrogenated fats are not so [1-5].

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