



## DAILY INGESTION OF STRUCTURED ALKALINE WATER (ORGANIZED/REGULARIZED) AND IT'S EFFECT ON HEALTH CONDITIONING

MADHAVI D. RANE<sup>a\*</sup>, NIDA SHAIKH<sup>a</sup> AND FARHAN MANIYAR<sup>a</sup>

<sup>a</sup>Department of Microbiology, Faculty of Science, Abeda Inamdar Senior College, Hidayatullahrd, Azam Campus, Camp, 411001, Pune, State Maharashtra, India.

### AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

*Received: 27 January 2022*

*Accepted: 01 April 2022*

*Published: 04 April 2022*

*Review Article*

### ABSTRACT

All life on earth thought to have aroused from water. Water is most essential part of the life. In today's busy lifestyle we have forgotten to keep our body maintain, the food we eat and water we drink .To keep our body well maintained its all depend on food and water we drink .Alkaline water is a water with high pH [1-2] and has many health benefits which is higher as compared to regular water. Alkaline water has many properties helps to fight against flu, ageing, tumors, chronic degenerative disorder, it has antidiabetic effect ..... consumption of Alkaline water can modify our lifestyle by detoxifying excess protein, acid waste which creates changes in the body .It also has antimicrobial activity on gut and served to reduce pathogenic bacteria. Alkaline water has wide uses in aquaculture and in medical such as for sterilization. Alkaline water wide application on plants which increase shelf life of fruits and vegetables, on animal which increases their weight and milk production. Alkaline water prevents DNA damage, stops the process of becoming older earlier by shortening the activity of telomeres length, It regulates blood sugar level ,showed a decreased in cholesterol, maintain healthy bones which women's are at higher risk for calcium deficiency. Most important cancer resistance. Detoxify organic residue present in the body.

**Keywords:** Alkaline water; ageing; tumor; anti-diabetic; anti-oxidant properties; Cancer; human gut; growth of plants and animal.

### 1. INTRODUCTION

Water is one of the most important factor or requirement in the life of living things. It is a necessary nutrient to every living organism and has been reported as the most important nutrient for growth and development. In the field of food science and technology, water is an essential for good digestion and to generate a healthy gut flora, which will help an animal to ingest all the necessary

nutrients [3]. The invention of structured alkaline water/hexagonal water shows various beneficial and crucial activities such as antiaging, antimicrobial activities with having cluster structure with antioxidant activity this act as an enhancing factor [4]. Structured Alkaline water also called magnetized water which is altered to form a hexagonal cluster that has certain properties that is better for the body which enhances nutrient absorption, cellular communication, removes metabolic waste. We can turn this water by

\*Corresponding author: Email: drmadhavidrane@gmail.com;

magnetizing process called vortexing or exposing to U.V, or natural heat sunlight. In which there is an alteration in the structure as compared to the normal water which have many benefits. Its structure is ( $H_3O_2$ ). As about alkaline water, the word itself say, there is an increase in pH. pH of this water is about [1-2] which is higher as compared to regular water. As body lacks some minerals, calcium, magnesium, bicarbonate due to our busy lifestyle so consuming this water we can get all these benefits that contains all alkaline minerals and has antioxidant properties.

As we know the aging is the unstoppable process in the living things except prokaryotes and algae, which is caused by the loss of crystalline structure and exposer to the low pH of water that surrounds the DNA helix and this leads to the shorting of highly coiled part of the DNA i.e. Telomerase. This is the molecular evidence of progressive aging and causes cell apoptosis [5]. There is a broad spectrum of diseases that is related to the aging and neurodegenerative diseases and the growth of the malignant tumor is very favorable to the acidic environment and the alkalization of the microenvironment highly impair tumor growth and progression [6]. This micro-environmental changes in the cell due to the pH and structure this highly impair the human growth progression. In this condition the body of a person should have the water of alkaline pH with hexagonal structure [7]. The accumulation of lactic acid and the  $CO_2$  in the muscles after the exercise leads to the slow down the recovery of muscles because of the reduction in the pH of the muscles and interstitial tissues that leads to the tissue acidification [8]. The hexagonal water having hexagonal ring structure in the water act to activate the cells in the body which causes beneficial effect to the health so the body get the more ability to cope the diseases. Prevention of the diseases such as constipation, diabetes, gastrointestinal disorders and lots of adult diseases [9]. Dr. Khosla a southern California based chiropractic and naturopath says the use of Structured Alkaline water may leads to the extra absorption of the water which is quite essential for the health and repairing so that this water even consider as better than spring [10], also having the physiological effects that aging is not due to the death of cell but it is due to the decrease in the water content of the cells. The body of adult or young consist of 80% of water but the 70 yrs old is typically less than 60% of water [11]. Only from the past 2 decades has it been consistently shown that structured water (SW), when used as a nutrient source for humans and animals, results in many positive responses including increased growth and productivity in animals and agricultural settings [12]. It also have better reproductive rate in animals after stimulating to

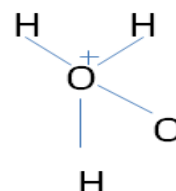
ovulation further the female mice were killed to examine the swelling in uterus and endothelial lining of the uterus it means we postulate that drinking SAW have positive effect on the cell growth [13]. The structured water also already a magnetized water this magnetization induces very positive effect on the humans and animals including agricultural animals [14,15]. The structured water is nothing but the arranged format of the molecules ( $H_2O$ ) in the definite hexagonal manner ,so due to this changing their will be the alteration in the absorption of infrared spectrum and also changes in the absorption of Raman spectrum as well as other approaches ,as the increase in the structuring there will be increase in infrared absorption and is directly proportional to the magnetic field intensity and duration of treatment. If we removed the magnetic field the effect of infrared absorption not remain long lasting the absorption rate decreases after 60 mins of applying magnetic field [16,17].

The use of Structured water on agronomic parameter analyzed in lavender and rosemary plant are treated with the Structured water the parameter show that there is significantly increase in the heights vegetative weight or increase in the fragrance, root length or microbial load on the roots and total floral biomass [18]. This water also have the beneficial effect on the lactating goats, sheep's, so that their lambs can grow very fast and become healthy [19,20].

In today's modern life people are facing problems due to our improper diet that can cause variety of disease [21] consumption of contaminated water affect the overall body specially gut system and can kill pathogens [22] Alkaline water kills pathogenic bacteria like *E. coli* , *salmonella*, *listeria monocytogenes* [23,24]. Alkaline water has showed antimicrobial activity and served to reduce pathogenic bacteria. It helps to reduce chronic illness [21]. It improves digestive health [25]. Alkaline electrolyzed water has many beneficial properties inhibiting the vast growth range of micro-organism. It increases shelf life of fresh pre-cut fruits and vegetables, reduces chemical cost. [Dev et al. 2014]; [Wang et al. 2016] Alkaline electrolyzed water has wide application in aquaculture and in medical uses. Alkaline electrolyzed shows bactericidal, virucidal and fungicidal effects [22] Alkaline water helps in reduction of oxidative stress inflammation etc. [22,2] electrolyzed Alkaline water has therapeutic effect to reduce insulin [2]. Electrolyzed Alkaline water control dental problems and prevent diseases like gingivitis, periodontitis [1]. Magnetic water has wide application that widely contribute in the treatment of health benefits in treating digestive diseases, urinary diseases and chronic degenerative disease ,also help to

reduce fatigue [26]. Alkaline magnetic water causes increases the milk production in animals [26]. It helps to regularize women's menses [26]. Alkaline water boost a positive creativity, immune response and metabolism [27,21]. It has antidiabetic effect, prevention in DNA damage [28]. Alkaline water stops the process of becoming older- decreases the telomerase length activity [29]. Alkaline water controls blood sugar level in the body [30]. Decreased in the cholesterol, abnormal glucose which women's are at high risk [31]. Alkaline water helps to regulate blood sugar, maintains pH that is produced by insulin [29]. Improvement in liver function, blood pressure, kidney dialysis and autoimmune disease can be prevented [32]. Alkaline water is said to have various minerals which body lacks so consuming Alkaline water maintains calcium level and healthy bones (Marc Henry and Jacques Chambron). Alkaline water has many properties like antiaging, colon cleansing, support immune system, enhances the positive mood

and has detoxifying properties, cancer resistance [27]. The research papers, review papers and other articles were published in this area are scientifically weak because the consistency among the publication there will be the need of more research permits one to draw conclusion and formulate for future. Our main purpose of this article writing is to summaries and highlights the beneficial biological and physiochemical effect of Structured water on Humans, animals and on plants.



**Chemical Structure of water**

**Table 1. Difference between structured water and unstructured water**

<b>Structured Alkaline water</b>	<b>Unstructured water</b>
The structured water is also known as hexagonal water in which the systemic arrangement of every single molecule in the hexagonal form by vortexing and magnetizing it	The unstructured water is don't have any structured form it results from the chemical treatment, pesticides, piping water to high pressure, pollution and electromagnetic radiation.
The structured water has two missing electron from its outermost orbit	The unstructured water has the lost electron in its outermost orbit
In structured water the molecules are arrangement in hexagonal forms that the biological organism prefer it for cellular communication such as enzyme functions or metabolic processes do better with hexagonal water.	In unstructured water they are like the Irregularity of molecules and the crowd of molecules
This water is surrounded by the every healthy things and it is optically charged and thought to have the greater amount of positive energy. The benefit of this is it makes overall work more efficiently.	As we know it is already secreted from the various Chemical treatments so definitely it is not optically charged and not surrounded by the healthy things the consumption leads to the harmful diseases.
The water in the cell or around the DNA is also alkaline hexagonal so the consumption of the water leads to the faster penetration in it, this causes increase in the water contain so that lower down the aging process by lowering down the telomerase activity	The consumption of the unstructured water (tap water) you most likely feel bloated this is the water must be reconstructed by the body to enable it to penetrate the cells this process requires energy. Or when it is the contaminated water with pollutants or chemical then leads to increased telomerase activity.
If the water is used for the gardening or for farming then 10-30% less water require. The healthier and deeper rooted requiring fewer input and give maximum output.	By watering the unstructured water to the plants it will get dry soon because of the heavy chemical intolerance. Or it will give the moderate output.
The alkaline structured water have the antimicrobial and anti fungal activity so it remains fresh for longer period of time	The unstructured water is already impure because of the passing it through the piping, water for high pressure, get contaminated with the pollution so this type of water will be the source of microbial and fungal infections so the water will not remain fresh..
The Alkaline Structured water has maintained with optimum pH, lower TDS, and some added minerals and vitamins. which makes it very nutritive and healthy for bones and skin	The Unstructured water is highly acid because of the pesticides and have very high TDS value due to the pollution.

Structured Alkaline water	Unstructured water
The structured water is also known as living water or the athletic water or hydrogenated water (due to the propose of fully addition of hydrogen molecules in it).	The Unstructured water also known as the polluted water or any normal unprocessed water.
After finding the water stored in the sterile conditions away from the microorganism is used for drinking or hospitality purpose. Even the long term storage causes no changes happen to this water	The unstructured water stored in the any tank or under water storage tank, Due to the water get contaminated with Bacteria, algae, fungi so the long term storage causes bad fishy stink and saturation of the slippery slime late on the inner wall lining of the tank.
The every molecule of the structured water carry the positive energy and there will be increase in the human energy field after the consumption of it	The unstructured water molecules have a specific structure there is no doubt but it is not the hexagonal structure the energy also get turned for per molecule after passing through the structuring unit.
The most beneficial thing of the SAC water is that it help the farmers to increase the crop yield by qualitatively and quantitatively. The regular use of structured water in the farm will cost incurred on pesticides and fertilizers, this increases the profit edge	In India the unstructured water rid tremendously used by the farmers to the fields the yield of the crop quantitatively and qualitatively remain at very moderate level.
Structured water has the greatest ability to hydrate detoxify and nourish the plants and the animals tissues and penetrate easily into the soil	The unstructured water also gain the ability to penetrate the soil and hydrate and detoxify the plant but the bore well need to pass through the natural phenomena called piezoelectricity (It is the Crystal Blue water structuring unit).

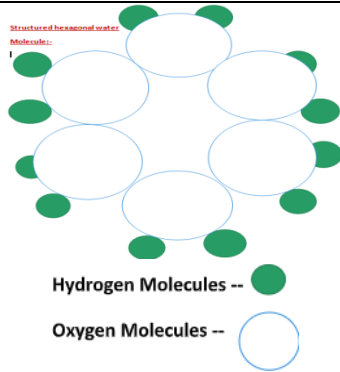


Fig. 1. Structured water

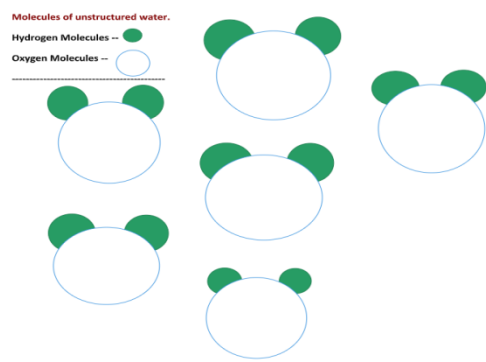


Fig. 2. Unstructured water

## 2. ALKALINE WATER

Now days alkaline water has become popular due to belief that it has many health benefits [27]. Alkaline water has many antioxidants properties and consumption of alkaline water may reduced the population of bacteria present in the human gut [27,21]. In addition it has been claim that consuming water with high content of total dissolved solids (TDS) and high level of mineral showed a lower incidence of heart disease, cardiovascular disease and cancer [21]. Consumption of alkaline water may prevent osteoporosis and protect from the acid production in digestive tract bacteria [21]. It showed a great improvement in chronic muscle, joint pain, reduction in stress level boost a positive creativity, improves heart rate and an improvement in immune response [21]. It has been revealed that alkaline water

provides a high longevity, as it increases the survival function and most important longer lifespan [28]. Alkaline water and electrolyzed water have been shown that it suppresses the effect of free radical in a living organisms, and resulting in prevention of many disease. It showed a great biological effect and antioxidant properties on bacterial pathogens, antidiabetic effect, and prevention in DNA damage and growth stimulation activities [28,27]. It has many health benefits in human related to many diseases, improves metabolism, prevents from gastrointestinal illness such as diabetes, cancer, inflammation, improves digestion, hydrates better than regular water [27]. It stops the process of becoming older and decreases the length of telomere activity [28]. The studies has been reported that after consuming alkaline water showed increased in urine volume, they were able to sleep well and felt good after awakening

most important reduces constipation problems and regularize women's menses [33,26].

### 3. ELECTROLYZED WATER

Electrolysis is a method of separating an ionic substances [34]. An electric current cause the chemical to react at the electrodes known as electrolysis. In today life's we are more concerned about consumption drink that have some beneficial effect on human health [22]. Most of the water is made by ultrasonification, or by passing through irradiation of light most of them are treated with magnetic field. Among this method electrolyzed water has been used as beneficial water (As the PH level of the solution on one side of the reactor moves from 7 to 2.8 becoming more acidic disinfecting molecules of hypochlorous acid, chlorine ions and hydrogen ions form with these new properties, the water kills or inhibits the growth of vast range of microorganisms in contact including germs that leads to food poisoning and even the viruses that cause HIV and hepatitis. Electrolyzed water also eliminates pesticides residue and mycotoxins and reduces germination of certain fungal spores .Electrolyzed water also has no adverse impact in the environment, because it leaves no toxic residue, it can be used to wash fresh precut fruits and vegetables without affecting taste and quality and extends the shelf life of fresh precut fruits and vegetables, providing processor with significant saving while helping the food- processing industry become more ecological. Electrolyzed water also been seen as a good chance to reduced the ingestion of heavy chemical cost (Dev et al, 2014); (Wang et al. 2016).

Acidic electrolyzed water (ACEW) and neutral water (NEW) relatively have a same property of antimicrobial agent against bacterial pathogens such as *E. coli* (Venkitanarayan et al. 1999, Kim et al., 2000, Park et al. 2004) *salmonella* (Venkitanarayan et al. 1999; Fabrizio and Cutter, 2004) and *listeria monocytogenes* (Venkitanarayan et al. 1999, Park et al. 2004) while AIEW is a alternative method of alkaline water [23,24] slightly acidic electrolyzed water (SAEW) treatment against bacterial pathogens against Gram positive and gram Negative results showed a great antimicrobial activity and reduction I.e inactivates *E.coli*, *S.aureus*, *s.enteruca* and *B. cerus* [24]. Due to the growing population and industrialization has been a problematic to agricultural pollutants disposal of industrial waste is soaked into the soil that changes the water quality so this may degrade the mineral content in water and leads to water hardness. Electrolyzed water may reduce the cost of hard water [24]. The use of Electrolyzed water has world wide application. (EW) is used as one of

the most used sanitizer in food aquaculture, medical etc. EW is also used for treating plant disease and can provide pesticide free and free- drug and fresh food for consumption. It is beneficial to health because it shows bactericidal, virucidal and fungicidal effect [22]. It reduces oxidative stress, inflammation, disease with cancer, diabetes, neurodegenerative disease etc [22,2]. EAW also has therapeutic effect to reduce insulin resistance [2]. EAW has some advantages because it has small cluster molecules as compared to other water and easily gets absorbed in the body .EAW shows effect on anticancer, antibacterial and has antioxidant activity [22]. EAW also control dental plaque and prevents disease like gingivitis, periodontitis. EAW do not disturb normal ecosystem, reduces plaque and significantly kills oral bacteria. It has been seen that there is significant inhibition growth of oral bacteria compared to tap water [1] EAW can contribute to neutralizing acid waste and maintaining proper pH balance in the body [35].

### 4. MAGNETIZED WATER

Magnetized water is a method by which we can soften the water by passing through a magnetic field that it reduces the effect of hardwater.

Magnetic treatment of water has found wide application in recent years in various practical human activity. The magnetic treatment is used for combating the precipitation in the production of concrete and enrichment of various minerals as well as for the intensification of water filtration process [36].

Many claim it has the property that gives high (increased) performance in regards to scale reduction (Alum et al 2006) increased crop yield (Lin Yotvat, 1990) also has many health benefits. Magnetized water has a wide application in different sciences field in industry, and especially in sustainable (green technology). For eg- like remediation of contaminated soil and sewage water treatment. It has been said that magnetized water are widely used in injection of fluid in oil recovering areas [37] When water was exposed to magnetic field there was an improvement in water quality with considerable and great changes in PH, total dissolved solids, total hardness, conductivity ,salinity, organic matter, evaporating temperature and total count of bacteria [26] Magnetization can affect the two forces that control the water structure, chemical bonds ,hydrogen bonds and van der Waal's forces, where magnetization can break down its structure and reduces the linkage angle and increases solubility. [37]. It is found that the magnetic field changes the size of water cluster which the intensity of magnetic field cause decrease of the surface tension

of tested water sample, which reduces the capillary rise of water. The magnetic water application in waste water has raise its physical and biological properties influencing in terms of solid – and liquid separation through aggregation of collidal particles and improvement in bacterial activity [37].

In application of magnetized water shows that it widely contributed in the treatment of health benefits and in the reduction of many diseases. Magnetized water perceptively used in healing digestive diseases, urinary diseases and chronic degenerative disease.

Some researchers pointed that exposure of water to magnetic field has difference between water exposed to north and south pole, that water exposed to north pole inhibits the growth of bacteria -stops cycle and work as antibiotics. The water exposed to South Pole helps in the treatment of swelling, pain and weakness. Overall it has been seen that water magnetized by north and south pole has overall general health care. Also it has been seen that magnetic water helps in the prevented of aging and fatigue [26]. Magnetic water in application of animals caused increased in milk and meat production, wool and many more [26].

Magnetized water improves metabolic activity and nutrient digestibility [26]. It helps to control women's menses [26] prevents stone formation..... [26]. Magnetized water unclogs veins that has been deposited with cholesterol and helps to normalize the circulatory system [26]. Contact of water with magnetic field treatment can reduce pathogenic microbes and improve the immune system, causes an increase in the solubility of calcium salts. Nowadays, the use of magnets is widely used to improve water quality is of importance interest due to low cost compared to chemical and physical treatments some Suggested that there is a slight change in mineral contents of water by magnetizing that causes them to pass the biological membranes more easily and quickly. After Water magnetization changes has been seen that the water properties become more energized, it has soften the water, increase in PH has been seen i.e (alkaline) and free of microorganism. When water solution passes through the magnetic field which increases the fluidity, dissolving capability for various constituents like minerals and vitamins and consequently improves the biological activity of solutions and showed positive effect on plants and animal [3].

**Table 2. Properties of water**

<b>Alkaline water</b>	<b>Electrolyzed water</b>	<b>Magnetic water</b>
Alkaline water has higher PH (8-9) as compared to normal water	Electrolysis is a method of separation of ions. A electric current is passed through electrodes.	Magnetized water is a method by which we can soften the effect of hardwater through magnetic field.
Alkaline water has antioxidant, antimicrobial, antidiabetic and antiproliferative activity.	Electrolyzed water has many health benefits, it kills vast variety of micro-organism in contact with germ which leads to food poisoning- inhibition of microbial load and viruses which causes HIV.	Magnetic water has many health benefits and has wide application in industry and green technology i.e – remediation.
High content of total dissolved solid [TDS] and mineral content lowers the heart disease and has ability of cancer resistance.	Electrolyzed water eliminates pesticides and toxic residue.	It is widely used in area of oil recovering.
Alkaline water gives relief from chronic muscle, joint pain reduction in stress and osteoporosis has been seen.	Electrolyzed water has extend shelf life of fresh fruits and vegetables which becomes more ecological.	Water exposed to magnetic field showed increase in TDS,PH, Conductivity, Salinity, fluidity etc.
Alkaline water has property of longetivity as it serves to give longer lifespan i.e prevents from ageing.	It reduces chemical cost and cost of hardwater ,can be used for sterilization of medical equipments.	It has physical and biological properties in terms colloidal particle.
Alkaline water prevents from DNA damage.	Electrolyzed water shows bactericidal, virucidal and fungicidal effects	Magnetic water consecutively used in treating urinary disease, digestive problems and showed improvement in bacterial activity.
It improves metabolism, digestion, gastrointestinal disease, constipation and reduces chronic health problems.	Electrolyzed water reduces oxidative stress, decreases sugar level, neurodegenerative disease, inflammation etc.	It helps to regularize women's menses.

<b>Alkaline water</b>	<b>Electrolyzed water</b>	<b>Magnetic water</b>
As body lack some mineral due to our busy life style so consuming alkaline water we can get all benefits of alkaline minerals.	Electrolyzed water shows property of insulin resistance.	Magnetic water works as antibiotic, improves metabolic activity.
Alkaline water has antiageing properties, colon cleansing, and removal of toxic residue from body.	Consumption of electrolyzed water can reduce oral disease and inhibits oral bacteria.	Magnetic water showed improvement in plants and animal Plants – crop yield Animal – milk and meat production.

### 5. EFFECT OF ALKALINE WATER ON HUMAN GUT

In today’s life most of people are facing stomach problems due to our improper diet because of which there is a lot of problems that can cause variety of diseases [21] consuming contaminated water or taking lots of junk food which directly affect the gut so consuming alkaline water can kill bacteria like *E. coli*, *Salmonella*, *Enteriditis listeria monocytogens* [22]. It showed a strong antimicrobial effect and served to reduce population of pathogenic bacteria and kill other bacteria. This water is very beneficial on human microbiota gut and reduced many diseases. This water help in breakdown of food easily, reduced acidity and gastroenteritis. Consuming alkaline water helps in colon cleaning and reduced the causing capacity of harmful bacteria. Alkaline water has many benefits that improve the quality which reduce many risk factor.

Use of alkaline water and alkaline diet helps digestive tract bacteria to decrease the diseases and prevention of illness [21].

Environmental factors such as prone to pesticides and junk food we eat seems to play a role to take up the pathophysiological falls in Parkinson’s disease disrupting the pathways of gut microbiota composition and subsequently increasing intestinal inflammation [38] Alkaline water has get a increased because of its shown attention towards many disease and prevention of many illness [25]. Alkaline water has antiobesity effect and showed a significant change in lactobacillacea and clostridiaceae [39] while examine the effect of clostridia spp, such as *C. difficile* on gut microbiota it showed a beneficial function of *C.butyrium* has been well known. It has been seen that clostridia spp categorized as pathogenic bacteria and showed a symbiotic relationship between human and gut microbiome benefits in many ways [39]. One of the most important feature is that it allow to extract calories from indigestible polysaccharide from our diet [39]. The most ruling population of bacteria in the gastrointestinal tract are Gram-Negative phylum

Bacteroidetes and Gram Positive phylum Firmicutes (Firmicutes that play a key role in immune regulation and intestinal health) which are involved in the class of clostridia ,the study reported that consumption of alkaline water has significantly increased firmicutes and decreased Bacteroidetes [39]. Alkaline water has played a novel role in improvement of abnormal intestinal problems ,gastric hyperacidity and most important improving in constipation, however it has been claim that lactobacillus has a novel role in probiotic and believed to improve digestive health problems and reduces the accumulation of body fat [25,39]. It has been concluded that structured alkaline water increase good bacteria - probiotic lactobacillacea and other good bacteria’s and decreases harmful bacteria- clostridiaceae [39].

### 6. EFFECT OF ALKALINE WATER ON HUMAN BEINGS

There are various effect of alkaline water on human beings as, diet, stress and exposure to toxins take a huge effect on our bodies such of the food we eat and beverages we drink that leave acidic ash which lowers the our body’s PH that leads to damage tissue, which results poor health so alkaline water has become popular in recent years due to beliefs that it has many health benefits. Alkaline water has rehydrating effects as compared to normal water like boosting immunity, help to control the acidity in our body which is caused by our poor diet, stress and environmental toxins. Alkaline water has antioxidant properties that help to prevent cell damage [29]. This alkaline water is said to be have various minerals like magnesium, bicarbonate and calcium needed for our body which are very important for maintaining healthy bones. Another beneficial effect is that it helps to slowdown the ageing process and prevents various chronic diseases. Consuming alkaline water reduced gastro-intestinal disorder. So consumption of alkaline water per day may it can help detoxify your body over time and help with health problems like high blood pressure and acid reflux. cure various illness like cancer , inflammation etc. (**Marc Henry and Jacques Chambron**) One of the most beneficial approach claim that it improves digestion , helps to reduced

weight loss and hydrates better than regular water. Alkaline water has many properties such as anti ageing and detoxifying properties, colon cleansing properties, it supports for immune system, hydration, skin health and other detoxifying properties, cancer resistances, improves metabolism, it reduces the formation of osteoporosis also it has medical application and many more [27].

## 7. EFFECT OF ALKALINE WATER ON DIABETIC PATIENTS

Numbers of patients with diabetic is increasing day by day around world. In this case patients should take proper medication to control their blood sugar level. It has been claim that Alkaline water works best to decrease blood sugar level [30] consuming Alkaline water it has been characterized that there was a decrease in insulin hormone which is produced by pancreas which control level of sugar [31,30]. Alkaline water contains bicarbonate ions which helps pancreas to work well because here pancreas plays an important role in maintaing the PH balance produced by insulin hormone [30]. It has been reported that Alkaline water given for 1 month for diabetic patients showed a great decrease in cholesterol, abnormal glucose and triglyceride level [31]. It has been seen women's are at higher risk of diabetes than men physically by increased in body mass index [31]. The antioxidant found in Alkaline water can help to control blood sugar in the body and aid to maintains PH that is produced by insulin. Alkaline water has small cluster of molecule that easily gets absorbed to the body cell and improve overall health effects [30].

## 8. EFFECT OF ALKALINE WATER ON AGING

Growing older is an inevitable process. Many of ours day –to- day habit already be going a long way to maintain health and look younger but it is unstoppable process called aging.

How aging occurs? From molecular point of view it occurs by telomeres (they are ends of chromosome) loss of telomere repeats in (stem) cells contribute to human aging. As telomeres gets shorter and shorter leads to aging. Some recent evidence been reported that accumulation to toxic and environmental factors may quick the aging process at cellular level. Moreover, a recent study has claim that telomere length may be significantly influenced to pH variation (i.e it shorten the telomere when expose to pH. This shortening of telomere can lead to DNA damage, inevitably cell apoptosis or senescence. Some paper have reported consumption of alkaline water may help in preventing cancer with combination metronomic

chemotherapy. In all result showed that consuming alkaline water has a systemic anti-oxidant, increases telomere length and delay aging process, it prolonged fertility periods, increase bone marrow and ovaries treated with mice. This all contribute in reducing aging-related tumors. At last this study shows drinking Alkaline water improves aging process at molecular level [29]. protects DNA damage and enhance growth stimulation activities. It exerts positive effect on body and development in oppspring [28] improves life as well [29].

### 8.1 Effect of Alkaline Water on Cancer

Tumor formation is become a hallmark of malignant cancer [40]. High exposure to acid generated in the body is outcome of any cancer development [41]. The changing diet to our modern lifestyle has increased the content of food we eat that form acid in the body which leads to metabolic waste residue [42]. The acid waste which is formed are released into the blood and interstitial fluid which slightly change PH, changing in the PH can turn to have non-communicable disease and may cause various health problem such as Hypoxia and cancer [42]. It has been well known that acidity is main cause/plays role of cancer growth and metastatization [32] i.e. diet is main reason of health and cancer risk [32]. Alkaline diet and alkaline drink has improve in primary and secondary cancer prevention during treatment [32]. There are different mechanism through which diet impact the maintains of the acid-base balance at various level such as 1) diet on digestion 2) Acidity or Alkalinity food and water ingested.3) Imbalance at cellular level caused by PH 4) Metabolic function [42] cellular respiration require proper PH action in terms of PH, temperature, oxygen, minerals , enzymes all these should be effective and controlled, If this process gets disturbed or damaged, cell may die. Dangerous cells are ones that survive with damaged cells. This can developed cancerous cells- metastasis (invades throughout the body) [42]. General public embolden to prevent cancer. They are more assess to urine, saliva, acidity in the body due to change in the pH [41]. Modern diet is the main cause of cancer, osteoporosis and cardiovascular disease [41]. Some researchers reported that cancer cell grow in acidic environment while alkaline diet or water is used to correct acidic state [41]. American institute of cancer society stated that PH is the main cause i.e the type of food we choice, and this ultimately affect urine PH.

Nowadays, urinary tract infection are at higher risk, consumption of Alkaline water can reduce the chance of infection ,prevent cancer related to UTI [41]. Reactive oxygen species (ROS) is abundantly produced by tumor cells than in normal cell. It is well known that Alkaline water has antioxidant property that can inhibit tumor



cell proliferation which is indicated by ROS, maintaining the loss of growth control [35]. AW serve to reduce the blood sugar because blood sugar is the major cause of cancer, cancer cells need more amount of sugar to grow fast and multiply at faster rate, maintaining the sugar level can lower the weakened cell, normal cell can survive. Thus having high level of sugar for longer period of time can lead to cancer and serious health problem [42]. AW has ability to inhibit the cancerous cell (apoptosis) invasion of human fibrosarcoma and may prevent different type of cancer [35]. Alkalization is inexpensive, highly effective against malignant features of tumor. It helps to protect risk of aggressive development of malignancies. AW improves drug efficacy and fight against cancer [40]. Selection of Alkaline diet or Alkaline water can prevent all these condition and has potential to treat cancer at developed stage [41].

## 8.2 Effect of SACW on the Animals Growth and Development

There are lots of studies and research that give the positive and great effect on animals health and reproduction system of Cattle, Goat, Rabbit, poultry etc.

### 8.3 Cattle

If Cattle drink the Structured Alkaline water this leads to the significantly increase in the subcutaneous fat in jersey cows and this increment majored by ultra sound therapy. The water reported a significant effect at 32,400 G magnetic field [4].

### 8.4 Goat, Lambs

The Goats and lambs are also tested with SAW/magnetized water with high TDS that also gives very crucial effect on the weight gain and increment in milk productivity [5,7].

**Rabbits:-** In rabbits the effect of electrolyzed/magnetic water cause weight gain [8]. The 4000 G of magnetic field is applied and it is beneficial to rabbits [8,6]. The study on rabbit done by a scientist El-Hanoun et al. has continuously reported significant increases in serum and it's total antioxidant capacity with reduced TBARS and it is formed by lipid peroxidation in both groups drinking SW compared with the control tap and well water groups [17].

**Poultry:-** The commercially important thing in poultry is for their early development, weight gain and improve the quality of meat by shortening the

fattening period of broiler chickens [9]. The magnetized water changes the property of water and becomes more soften or slight alkaline in pH this changes increases the fluidity and dissolving minerals and vitamins in the water by Brownian movement [10] and affect positively to the animals and plants [11,12].

**Fish:-** Aquarium fish put in structured water so study reported that their will be reduction in the renal calcium, ammonia poisoning [14] and nitrate poisoning in the fishes [15] and will not feel ill by little bit increase in the ammonia [16].

## 8.5 Effect of SW on Plants

The SAW is nothing but the proper arranged of hydrogen and oxygen molecules the study shows that we must use SAW for plants /agricultural bodies because it contain no energetic toxins, It forward with high oxygenation state, increases the chlorophyll content and mineral supply and regulate balance of soil and minerals.

Plants like strawberry, tangerine, sprouts, lemon and grapes will grow faster, mature earlier and taste yield get increases [20,43].

## 8.6 Biological Effects

The following effect of water will affect the development, function and regularity of the organs [13], because of the Brownian motion are fundamentally important for protein function. The electrons, protons, active hydrogen, hydrogen ions these hydrogen molecules and oxygen come together and form water and only ROS increases in water [18]. Thus, water will become good for digestion and also good flora will increases and play crucial role in nutrient absorption [19].

## 8.7 Physiochemical Property

The consumption of magnetized water/structured water by children infected with the parasitic condition ascariasis resulted in resolution of the condition in with "no side effects" in most conditions [44].

## 8.8 Physiochemical Properties of Structured Alkaline Water

The water is analyzed for its chemical properties to check the effectiveness of a desired chemistry process for which it is heated at 100°C to 374°C during this process various physiochemical properties are manipulated including [45].

**Table 3. Physiochemical properties of Structured alkaline water**

Parameters	Untreated water /Normal Tap water	Magnetically Treated water with 500 Gs
Conductivity (ms cmG1)	650.00	655
Density (mn mL/G1)	50.10	40
Total dissolved Salt	4.93 ppm	4.98 ppm
PH	7.60	7.62
Salinity (ppt)	0.28	0.29
Dissolved oxygen mg/L	50.10 mg/L	52.20/L
Viscosity (cSt)	0.79	0.81
Plant height (cm/plant)	55,46	63,34
flowers Biomass(gm/plant)	13.91	16.40

### 8.9 Benefits of Structured Alkaline Water

Structured alkaline water has a wide range of purported health benefits. Since our body is made up of 90% of water so drinking plenty of structured alkaline water helps the body to maintain peak performance.

- ) Structured water takes the toxic load and waste product out of body efficiently.
- ) Dehydration is the major problem taking enough structured water can help to reduce the symptoms.
- ) Structured Alkaline water has a wide role in reduction of bacterial load [21].
- ) Structured Alkaline water plays a role in strengthening and preserving immune system.
- ) It helps to fight against bacteria, flu, pathogens and elimination of disease.
- ) Drinking the proper amount of structured water will help in greatly reducing cancer causing agents especially in the bladder and Colon [2].
- ) It helps to maintain proper PH balance in order to remain healthy and vibrant.
- ) It has Colon cleansing properties, anticoagulatory effects.
- ) It helps to fight against skin disease, increases energy, improves good memory, promotes better sleep, helps to detoxify the body, promotes longer life, loss in weight, most important promotes good digestion, reduces constipation.
- ) It slow down the ageing process [29].
- ) Blood glucose reduction in diabetics, improves skeletal [Bone] system health and most important positive mood enhancement [31,30].

•) It has health promotion properties and prevention of chronic illness [21].

However, there is no scientific studies come out regarding its health benefits. Some argued that to keep yourself hydrated eat healthy diet you will achieve same result when as drinking alkaline water. You can also buy drops which is added to regular water in order to make alkaline.

### 9. LIMITATIONS

As we learned that Alkaline water enhances the alkaline water has beneficial effect in the body in many ways. On the contrary consumption of more alkaline water can be harmful to the health. This can be caused by drinking much alkaline water

- Following side effect can be seen-
- Feeling dizzy
- Prolonged muscle strain
- Hand trembling
- Feeling of tingling in the face, hand, and feet
- Confusion
- Anxiety and irritability
- Excess amount of AW water can result in sleepiness and tiredness
- It requires special filters
- It is more expensive- Due to filters
- Decreases the level of stomach – Acid present in the stomach is very important for regulating the PH of stomach, High level of stomach acid isn't good for your health.
- Consumption of excessive amount of alkaline water can reduce natural acid in the stomach and can cause alkalosis, so it must be drank in moderate amount.

### 10. CONCLUSION

Structured Alkaline water is also called magnetized hexagonal water by a process vortexing. Its structure is H<sub>3</sub>O<sub>2</sub>. PH is about [1-2]. As body lack some minerals, nutrients taking structured water could help

to build up lack of minerals. It has antioxidant property. It has been claim that structured alkaline water has antimicrobial activity that kills pathogenic bacteria like *E. coli*, *Salmonella enteritidis*, *Listeria monocytogens etc and reduces population* of microbisidal bacteria. Use of alkaline water prevents many illness and fight against variety of diseases. There are various effect of alkaline water on human beings like reduce in stress and exposure of environmental toxins such as the food we eat and beverages we drink also boost immune system, reduces gastro- intestinal disorder. It has many health benefits related to many diseases improves metabolism, illness such as diabetes, cancer, inflammation, improves digestion and hydrates better than regular water. Structured alkaline water consumption decreases the formation if free radical and due to increase in pollution water is contaminated and to purify it undergo many chemical methods are done which losses its structure so taking this water help to re-structure. It has many health benefits like colon cleansing, prevents skin diseases, support immune system, loss in weight, enhancement if positive mood and many more. Decrease in creatinine levels, proper kidney function, increase in hemoglobin in erythrocytes. We can be concluded that the structured water have positive biological and physiology effect on plant as growth promoting factor especially growth of lavender and Rosemary. The magnetic effect of that water leads to the reduction in the fertilizer and drying of plants. The magnetic strength must be 500 to 32,400 G force and it is require to generate water that have beneficial effects. The future research needed for specific biological outputs and this used to demonstrate how these effect occurs and the these type of structured /magnetized water are safe to consume and use for the long term.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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