



## Pharmacological Activity Investigation of Alkaline Water – A Review

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### ABSTRACT

In present study various pharmacological investigation of alkaline water compiled, now days due to fast life acidity become a huge problem in metro cities which is origin for various diseases such as GERD, hypertension, skin diseases, hyperthyroidism, hyperlipidemia, cancer, diabetes etc. Various researches worked on activity of alkaline water and various clinical trials are in tunnel. Compile date elucidate the importance of alkaline water in various diseases treatments and future prospectus in clinical trials of various cancer and related diseases.

**Keywords:** Alkaline water, acidity, Cancer, Pharmacological investigation.

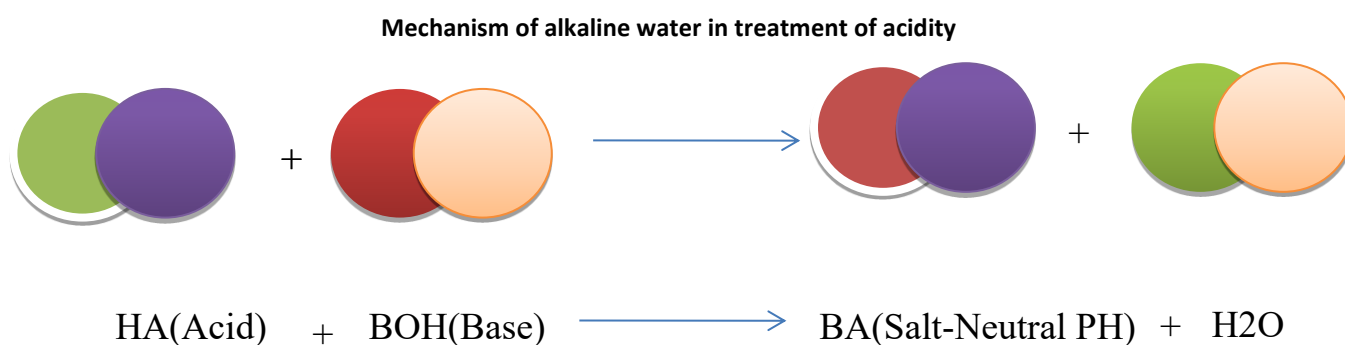
### INTRODUCTION

Acidity is most important and ignored reason in development of different diseases like hypertension<sup>1</sup>, skin diseases<sup>2</sup>, hyperthyroidism<sup>3</sup>, hyperlipidemia<sup>4</sup>, cancer<sup>5</sup>, diabetes<sup>6</sup> and related diseases etc. In allopathy physician only work on sign and symptoms

of the diseases after performing various expensive diagnosis test like ECG, Kidney function, Blood test etc., but the root of this disease condition is completely ignored. The Natural alkaline water is one the solution to cure root of this diseases. In this article would like explore the various researches done on alkaline water and futuristic research possibilities.



Figure 1: Root cause of various life-threatening diseases



**Figure 2:** Mechanism of alkaline water

Research performed by American institute for cancer research claimed that acidity can alter the body's pH balance and promote cancer. The unproven theory is based on lab studies that advise cancer cells thrive in an acidic (low pH) environment, but cannot survive in alkaline (high pH) surroundings. The Research proven that the cells in an isolated lab setting. Altering the cell environment of the human body to create a less-acidic, less-cancer-friendly environment is virtually impossible. Even slight changes to your body's pH are life-threatening events. Patients with kidney disease and pulmonary dysfunction. To avoid even small disruption of acid-base balance we can focus on root cause that is the acidity, which can prevent further diseases consequences.<sup>7</sup>

#### Alkaline water

The "basic" in alkaline water alludes to its pH level. A pH level is a number that estimates how acidic or soluble a substance is on a size of 0 to 14. For instance, something with a pH of 1 would be acidic and something with a pH of 13 would be basic. Basic water has a higher pH level than standard drinking water. Along these lines, a few backers of antacid water trust it can kill the corrosive in your body. Typical drinking water, for the most part, has an unbiased pH of 7. Antacid water regularly has a pH of 8 or 9. In any case, pH alone isn't sufficient to bestow considerable alkalinity to water. Basic water should likewise contain alkaline minerals and negative oxidation decrease potential (ORP). ORP is the capacity of water to go about as a cancer prevention agent. The more negative the ORP esteem, the more anti-oxidizing it is.

#### AN OVERVIEW OF THERAPEUTIC POTENTIAL OF ALKALINE WATER

##### Alkaline water as a treatment of reflux disease.

**Koufman JA et al (2012)**<sup>8</sup> performed clinical trial on human volunteer they proven the effect of alkaline water in treatment on human reflux diseases specially the natural alkaline water leads to denature human pepsin and its acts like buffering agents. Researcher proven the effective denaturation of pepsin at pH 8.8 exactly.

##### Alkaline water as an antioxidant activity

**Lucas Pellegrina et al (2019)**<sup>9</sup> has carried out growth response biological investigation by using different alkaline

PH water on pacu juveniles. In this experiment Pacu fish were investigated to the different PH such as 5.5, 6.5, 7.5 and 8.5 for 45 days. In that experiment they were found that the fish at water PH of 8.5 were developed at significantly higher than another PH. And in acidic PH it reduces the muscle antioxidant capacity against peroxy radicals and glutathione s transferase. It was also observed by investigator that the Change PH did not affects on other factors like blood glucose, Hematocrit, Plasma, muscle content of protein thiols and thiobarbituric acid reactivity substances.

**Yoshinori Tanaka et al (2018)**<sup>10</sup> used AEW (alkaline electrolyzed water) for investigation on abdominal complaints under the guidance of ethical committee. Researcher selected a group of objects without any complained of gastrointestinal problem for which AEW used in Japan. Researcher demonstrated a double blind randomized controlled trial for four weeks. Before control trial preliminary investigation was performed like blood tests, physical fitness. and questionnaire evaluation. In this study they concluded no significant side effect on intestinal integrity. Additionally, they stated the improvised sleeping state and felt good when awakening due to reduction in oxidative stress which opened up the novel research area alkaline water as antioxidant agents

##### Alkaline water as an anti-aging property

**Massimiliano Magro et al (2016)**<sup>11</sup> has performed the survival study on 150 mice for 3-years and by using accelerated failure time (AFT) model proved that the survival rate of mice watered with alkaline water is more than the control mice. It was also observed that alkaline watered mice have decline aging factor as compare to control group. Again, investigator performed toxicity assessment study by using histopathological examination on kidney, intestine heart liver and brain which resulted in no significant pathology

##### Alkaline water as an anti-bacterial activity

**Ahn, Seon-Mi et al (2010)**<sup>12</sup> presented pharmacological investigation study of AIW (Alkaline ionized water), PW (purified water and DW (drinking water) in which they performed. In which PH and ORP (oxidation- reduction potential) of water was 9.5 and 120mV, 7.2 and 144 mV and 7.3 and 564mV, respectively. Research proven no

significant antioxidant activity of any of water used in experiment quoted above. Only the power of standard substance used in DPPH ((1,1-diphenyl-2-picryl hydrazyl) assay that is vitamin C found to be stable in AIW and PW as compare to DW. Similarly, the standard used in antithrombosis activity that is aspirin shown improved biological absorbance in AIW and PW as compare to DW. Research also investigate the cell growth analysis and viable cell count of *Escherichia coli* in above 3 motioned water as a result again AIW and PW showed antibacterial activity and DW not.

### Alkaline water as a power booster for sports men

**Jakub Chycki et al (2018)**<sup>13</sup> worked on problem faced by sports men due to water restriction for quick weight loss before tournaments they proven the effect of alkaline water as prevention for exercise-induced metabolic acidosis. Researcher performed the double randomized clinical trials on sixteen well trained sports athletes by keeping control with normal tap water for three weeks. Anaerobic performance was evaluated by two double 30 s Wingate tests for lower and upper limbs, respectively, with a passive rest interval of 3 minutes between the bouts of exercise. The results indicate that drinking alkalized water enhances hydration, improves acid-base balance and anaerobic exercise performance. Significant increase in mean power when comparing the values (7.98 J/kg to 9.38 J/kg with  $p = 0.001$ ) at baseline vs. at the conclusion of the study in the experimental group supplemented with alkaline water. In contrast, the control group which received table water did not reveal any statistically significant results.

**Joseph Weidman et al (2016)**<sup>14</sup> studied the fluid replacement beverages ingested on healthy adults after exercise showed hydration biomarkers like effects researcher carried out randomized, double-blind, parallel-arm trial assessed the effect of high-pH water on blood viscosity. After exercise-induced dehydration as a results high-pH water reduced high-shear viscosity by an average of 6.30% compared to 3.36% with standard purified water ( $p = 0.03$ ) significant difference in whole blood viscosity was detected in this study when assessing a high-pH, electrolyte water versus an acceptable standard purified water during the recovery phase following strenuous exercise-induced dehydration.

**Jr, Senay LC et al (1996)**<sup>15</sup> collected various clinical trials data on human sports volunteers in japan in which fluid replacement promotes optimal physical performance, reduced water scavenges active oxygen & protects DNA from oxidative damage, The mechanism of the enhanced antioxidant effects of reduced water produced by electrolysis, Antimicrobial interventions to reduce Salmonella species on poultry, Treatment of *Escherichia coli* inoculated alfalfa sprouts with electrolyzed oxidizing water, Inactivation of *E. coli* & *Listeria* on plastic kitchen cutting boards by electrolyzed oxidizing water, Effect of electrolyzed water on wound healing, The bactericidal effects of electrolyzed oxidizing water on bacterial strains

in hospital infections, Effect of electrolyzed oxidizing water on excised burn-wounds, Decomposition of ethylene, a flower-senescence hormone, with electrolyzed anode water, Use of Ionized water in hypochlorhydria, achlorhydria, reduction of high blood pressure, Use of Ionized water for gynecological conditions, Clinical Improvements obtained from the uptake of Ionized Water, Alkaline ionized water for abdominal complaints: Placebo controlled double blind tests, Physiological effects of alkaline ionized water: intestinal fermentation, Effects of calcium alkaline ionized water on formation and maintenance of osseous tissues, Reduced Water for Prevention of Disease, Use of Ionized water in heart disease and toxins, Use of Ionized water in skin disease, Use of Ionized water in allergies, Use of Ionized water in diabetes treatment, Use of Ionized water in treating Acidosis, Environmental electrochemistry of water clinical study on volunteer researcher recommended that individuals consume a alkaline water especially during the period that includes the meal prior to exercise, to promote proper hydration before exercise or competition. It is recommended that individuals drink about 500 ml (about 17 ounces) of alkaline water about 2 hours before exercise to promote adequate hydration and allow time for excretion of excess ingested water.

### CONCLUSION

Various researchers signify the importance of alkaline PH water in growth factor by using randomized human and *in vivo* trials for. Researcher opens up the novel hypothesis for human trial on ageing factor investigation. The importance of alkaline water for drug stability and antibacterial properties will be a blockbuster area for drug absorbance enhancement and various pharmacological investigations. Regardless of the advancement of the alkaline water by the media and sales representatives, there is no genuine research to either encourage or discredit these facts and figures. This methodical survey of the writing uncovered an absence of proof possibly in support of alkaline water for the inception or treatment of malignancy. Advancement of alkaline water to people in general for cancer and another acid related diseases treatment isn't legitimized.

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