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Radioactivity Properties of Natural Salts Proving a Strong Prophylaxis in Covid-19 Pandemic

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Keywords: *prophylaxis; viral infection; natural salts; trace minerals; radioactive elements.*

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Radioactivity Properties of Natural Salts Proving a Strong Prophylaxis in Covid-19 Pandemic

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It is hypothesized that Covid-19 mortality is inversely proportional to consumption of natural salts. This hypothesis successfully explains the huge differences in the mortality rates between the rich and the poor countries. Till date, no other hypothesis or scientific explanation has been put forward to explain huge mortality differences. The radioactivity properties make the natural salts an appealing prophylaxis against virus attacks.

Keywords: prophylaxis; viral infection; natural salts; trace minerals; radioactive elements.

I. BACKGROUND

The whole world continued to face worst public health and economic catastrophe from the onslaught of Covid-19 pandemic over more than a year with no solution in sight so far. SARS-CoV-2 virus is one of the most virulent strains of coronavirus that has inflicted colossal hardships on the global population primarily in terms of untimely deaths of loved ones and huge financial losses. Economy of the whole world is jeopardised. Perpetual fear of death forced the human race to adopt new living normal on a global scale. There are several health disorders manifestations that resulted from the infected and uninfected populations and created additional healthcare burdens on an unprecedented scale. Frequent usage of sanitizers, and prolonged wearing of face masks caused many skin and health disorders especially mental disorders.

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Global data over a year on Covid-19 morbidity and mortality among most of the rich and poor countries baffled public healthcare professionals and doctors all over the world. The USA and the EU nations like the UK, France, Italy, and Spain reported morbidity/mortality per million several hundred times more than the poor or underdeveloped countries like India, Myanmar, Laos, Cambodia, Vietnam, Nepal and Afghanistan where morbidity/mortality is zero or significantly low. No explanation has come up till date for this huge difference in morbidity/mortality between the rich and poor countries.

According to the Johns Hopkins Coronavirus Resource Center data, the pandemic caused more than 88.5 million cases and 1.9 million deaths globally;¹ India reportedly had more than 10.4 million cases with death toll of 150,606 at the time of writing on by 08th January, 2021 and numbers are galloping with every passing day. Despite the vast global pool of healthcare knowledge no ideal treatment has been evolved so far. The virus has been found to affect almost all organs including the brain. Cases of blood clots and existence of virus in seminal fluid have also been increasingly reported thus affecting sustainability of the human race. Near absence or short life of antibodies in symptomatic subjects is a major cause of concern leading to frequent relapses and dimming the hope of any effective long term vaccine.

Stretched isolation and lockdowns resulted in separation from elderly parents and children and vice versa have caused elevated anxiety levels that led to onset of many non-communicable health disorders including suicides.² Reported spikes in suicides by individual and families for want of money and uncertain future including the suicide by 54 year old Thomas Schäfer, German finance minister, are causes of serious concern. Spurt in clinical manifestation of several non-communicable health disorders of unknown origin like mild to severe abdominal pain, hypo- and hypertension, disturbed sleep, myalgia, convulsions, mental disorders like compulsive obsessive disorder (COD), prolonged constipation, gastrointestinal (GI) disorders, skin disorders like stress rashes, warts and allergy, and many more are being reported from all over the world. Aggravation of pre-existed health disorders is also being reported.

- a) *World Health Organization (WHO)*: Several long lockdowns, face masks and social distancing as per the WHO guidelines could not impede increasing morbidity/mortality rates in developed countries despite robust healthcare infrastructure. Global healthcare experts and WHO have expressed draconian opinion that the virus is going to stay and all have to learn live with it. Thus, unlike earlier epidemics, Covid-19 pandemic is likely to make a paradigm shift in living protocol for next several years in absence of any inexpensive treatment or prophylaxis. On 13 July 2020, Director General of WHO warned "If basics are not followed, the only way this pandemic is going to go - it is going to get worse and worse and worse."³ Now most of the healthcare experts talk about second wave of destruction.
- b) The big question arises: Do we all have to live with face masks, social distancing, personal protective equipment (PPE) kits, compulsive use of sanitizers, lockdowns, work-from-home, on-line schools, no beach strolls, no enjoyment tours, no nightlife, no morning walk, no family celebrations, no religious gatherings and no friends gathering. These guidelines have already started showing dreaded

picture of coming times. Nobody can predict the health outcome of such measures in the case of infants and toddlers. Already handful of deaths have been reported across the world on account of face masks and PPE kits.⁴⁻⁶ Distress calls to specialists like psychiatrists, ophthalmologists, dermatologists, and cardiologists have increased 3-4 times. How long these precautions need to be taken? It should not have happened that in the process of defeating the virus global population fall victim to other long term morbidities and forget pre-pandemic life.

II. MATERIALS & METHODS

- a) *Natural Salts*: Natural salts are basis for the study. Ancient system of Indian medicine (*Ayurveda*) associates many clinical and nutritional values to natural salts especially the pink Himalayan rock salt. These salts contains more than 85 micro-macro-minerals and trace elements (MMTE); some of these elements are radioactive capable of emitting α , β , and γ radiations.⁷ Spectral analysis shows that Himalayan rock salt contains 86 elements including 12 radioactive elements besides sodium and chlorine (Table-1).

Table-1: Spectral analysis of Himalayan Rock Salt

S. No.	Element	Atomic Number	Concentration	S. No.	Element	Atomic Number	Concentration
1	Hydrogen	1	0.3 g/kg	45	Indium	49	<0.001 ppm
2	Lithium	3	0.4 g/kg	46	Tin	50	<0.01 ppm
3	Beryllium	4	<0.01 ppm	47	Antimony	51	<0.01 ppm
4	Boron	5	<0.001 ppm	48	Tellurium	52	<0.001 ppm
5	Carbon	6	<0.001 ppm	49	Iodine	53	0.01 g/kg
6	Nitrogen	7	<0.024 ppm	50	Cesium	55	<0.001 ppm
7	Oxygen	8	1.2 g/kg	51	Barium	56	1.96 ppm
8	Fluoride	9	<0.1 g/kg	52	Lanthanum	57	<0.001 ppm
9	Sodium	11	382.61 g/kg	53	Cerium	58	<0.001 ppm
10	Magnesium	12	0.16 g/kg	54	Praseodymium	59	<0.001 ppm
11	Aluminium	13	0.661 ppm	55	Neodymium	60	<0.001 ppm
12	Silicon	14	<0.1 g/kg	56	Promethium*	61	Unstable
13	Phosphorus	15	<0.1 ppm	57	Samarium	62	<0.001 ppm
14	Sulphur	16	1.24 g/kg	58	Europium	63	<3.0 ppm
15	Chloride	17	590.93 g/kg	59	Gadolinium	64	<0.001 ppm
16	Potassium	19	3.5 g/kg	60	Terbium	65	<0.001 ppm
17	Calcium	20	4.05 g/kg	61	Dysprosium	66	<0.4 ppm
18	Scandium	21	<0.0001 ppm	62	Holmium	67	<0.001 ppm
19	Titanium	22	<0.001 ppm	63	Erbium	68	<0.001 ppm
20	Vanadium	23	0.06 ppm	64	Thulium	69	<0.001 ppm
21	Chromium	24	0.05 ppm	65	Ytterbium	70	<0.001 ppm
22	Manganese	25	0.27 ppm	66	Lutetium	71	<0.001 ppm
23	Iron	26	38.9 ppm	67	Hafnium	72	<0.001 ppm
24	Cobalt	27	0.6 ppm	68	Tantalum	73	1.1 ppm
25	Nickel	28	0.13 ppm	69	Wolfram	74	<0.001 ppm
26	Copper	29	0.56 ppm	70	Rhenium	75	<2.5 ppm
27	Zinc	30	2.38 ppm	71	Osmium	76	<0.001 ppm
28	Gallium	31	<0.001 ppm	72	Iridium	77	<2.0 ppm
29	Germanium	32	<0.001 ppm	73	Platinum	78	0.47 ppm

30	Arsenic	33	<0.01 ppm	74	Gold	79	<1.0 ppm
31	Selenium	34	0.05 ppm	75	Mercury	80	<0.03 ppm
32	Bromine	35	2.1 ppm	76	Thallium	81	0.06 ppm
33	Rubidium	37	0.04 ppm	77	Lead	82	0.01 ppm
34	Strontium	38	0.014 g/kg	78	Bismuth	83	<0.01 ppm
35	Yttrium	39	<0.001 ppm	79	Polonium*	84	<0.001 ppm
36	Zirconium	40	<0.001 ppm	80	Astatine*	85	<0.001 ppm
37	Niobium	41	<0.001 ppm	81	Francium*	87	<1.0 ppm
38	Molybdenum	42	0.01 ppm	82	Radium*	88	<0.001 ppm
39	Technetium*	43	Unstable	83	Actinium*	89	<0.001 ppm
40	Ruthenium	44	<0.001 ppm	84	Thorium*	90	<0.001 ppm
41	Rhodium	45	<0.001 ppm	85	Protactinium*	91	<0.001 ppm
42	Palladium	46	<0.001 ppm	86	Uranium*	92	<0.001 ppm
43	Silver	47	0.031 ppm	87	Neptunium*	93	<0.001 ppm
44	Cadmium	48	<0.01 ppm	88	Plutonium*	94	<0.001 ppm

* Radioactive elements

- b) Data on morbidity/mortality has been taken from opensource centre of Johns Hopkins University¹ for the study. It has been further supplemented with the other reliable sources in digital and print

media. Table-2 depicts mortality per million among the randomly picked 18 rich and the poor countries as on 8th January 2021; People's Republic of China was not considered due to quality of reported data:

Table-2: Mortality per million data for about a year up to 8th January 2021

Developed Countries	Mortalities	Under Developed Countries	Mortalities
The USA	1,127	Laos	0
The UK	1,153	Cambodia	0
France	1,023	Vietnam	0.35
Spain	1,105	Nepal	65
Belgium	1,716	Myanmar	51
Italy	1,279	Sri Lanka	10
Canada	437	Afghanistan	57
Russia	414	Pakistan	47
Japan	30	India	109

Note: China is not considered because of suspicious data.

- c) Socioeconomic Status (SES) and dietary habits of natives in rich and poor countries were also studied to see if there is any bearing on pandemic strike and survival.
- d) A passing reference to ethnicity has also been considered. An important input stems from the

mortality of two affluent practicing Indian-American doctors in New Jersey, USA, in the first week of May 2020. For the purpose of study, a preliminary comparison was made with extreme poverty stricken subjects in India, Table-3:

Table-3: Comparisons between rich Indian-Americans and deprived class of native Indians

Parameters	New Jersey (USA) Doctors (n=2)	Extreme Rural Poor in India
Socioeconomic Status	High	Lowest
Hygiene	High	Lowest
Nutrition/food	Rich and balanced	Difficult two square meals
Health	Excellent	Undernourished
Healthcare	Access to state-of-art	Almost nil
Vulnerability	Low	High
SARS-CoV-2 Impact	Infected and succumbed	No case of infection reported so far
Salt type	Ultra refined table salt	Cheapest raw sea salt

- e) *Earlier Study*⁸: The present study is supplemented by an earlier study made in 2015 on prevalence of non-communicable diseases (NCD) involving 314 subjects from 78 families comprising children and

elderly population of both genders across India that indicated significant role of ultra refined table salt for the onset of NCD. The study was initiated during treatment of chronic diseases and subjects were

advised to switchover to natural salts. The group (n=314, median age = 53 years), except one family, voluntarily switched from ultra refined table salt (Sodium Chloride) to pink Himalayan rock salt and remaining one family of four (two adults and two children) switched to sea salt (being cheaper) due to financial constraints. Since outbreak of pandemic this study group has been expanded to 6713 subjects including infants and elderly over 90 years.

- f) *Religious Practices:* Traditionally most of the Hindu population, during observation of fasts on religious events, consumes Himalayan rock salt in place of natural sea salts or ultra refined iodised table salt. On an average, a sizable majority of this adult population observes at least 5-6 fasts in a year and consume rock salt even if they are totally dependent on the pure sodium salt; its importance will be discussed later.

III. HYPOTHESIS

Based on the clinical experience for almost a decade on root cause of increasing incidence and prevalence of non-communicable diseases and simultaneous observations on influenza like illness (ILI) and vector born morbidities, it is hypothesized that *SARS-CoV-2 morbidity/mortality is inversely proportional to consumption of natural salts or directly proportional to the pure sodium chloride table salt:*

$$\frac{\text{SARS-CoV-2 Morbidity/Mortality } \alpha \text{ (Natural salts usage)}^{-1}}{\text{or}} \frac{\text{SARS-CoV-2 Morbidity/Mortality } \alpha \text{ (Sodium Chloride usage)}}$$

The hypothesis is aimed to find an answer for the huge difference of morbidity/mortality in economically rich and poor countries, with special reference to Japan that has lowest morbidity/mortality among rich countries with the similar healthcare infrastructure.

IV. DISCUSSIONS

- a) Totality of observational evidence suggests that populations largely dependent on natural salts in poor countries fared significantly better in the Covid-19 pandemic than the populations dependent on highly processed refined pure sodium table salt in the rich countries. It is worth mentioning that most of the Japanese prefer natural salt known as 'SHIO' and has shown low morbidity/mortality compared to the EU nations and the USA despite similar healthcare infrastructures (Table-2).

- b) *Disruption of Binding Mechanism:* A logical explanation for extremely low mortality/morbidity in the poor countries appears to have stemmed from the consumption of natural salts that provides better immunity against pathogen assault seen in the earlier study on account of presence of MMTE including radioactive elements.⁷ Incidentally in the last 4-5 years, this study group has not experienced any morbidity like ILI or other vector-borne diseases like malaria, dengue, and Japanese Encephalitis. Since there is no Covid-19 mortality/morbidity case surfaced over a year in the study group spread over 27 hot spots across India, it can be safely concluded that the binding mechanism between the virus and ACE2 protein is not taking place. Though in infinitesimal quantities, α , β , and γ radiations from radioactive elements with large half-life cycles 10^3 to 10^7 years might had played a vital role in inactivating SARS-CoV-2 virus and resulted in the failure of binding of the SARS-CoV-2 virus RNA with receptor ACE2 cells. There could be three possible mechanisms at the cellular level:

- Since γ rays are very powerful which can only be stopped by one meter thick concrete block, the aura of γ radiations generated from radioactive elements present in natural salt inactivates the virus outside the human body, or,
- Presence of trace radioactive elements inactivates the virus through modifications in the virus envelope or RNA inside the body, and/or
- Impact of MMTE on binding mechanism.

Inactivating effects of radioactive radiations on viruses were studied in the past.^{9,10} It seems that even occasional intake of natural rock salt provided enough radioactive radiations to inactivate attacking viruses and thus enable the body to fight onslaught of pathogens successfully. No other explanation supports such a low morbidity/mortality in India where 65.97% of 1.35 billion disadvantaged population lives in villages and is deprived of adequate nourishment with little or no modern healthcare system.

- c) *Radioactivity processes in human body:* Host of radioactive elements found in human body play very critical role in many metabolic functions e.g. iodine for thyroid. These radioactive elements ^{238}U , ^{234}U , ^{232}Th , ^{210}Po , ^{210}Pb , ^{40}K , ^{226}Ra , ^{228}Ra , ^{14}C , ^7Be , ^{22}Na , ^{137}Cs and ^{90}Sr enters the body mostly through dietary route and many others listed exclusively in Table-1. The concentration of the gamma emitting radionuclides, except for ^{40}K , in human is so small that their detection is difficult.^{11,12} On natural decay radioactive elements emit α , β , and γ radiations and get transformed into secondary radionuclides or daughter nuclides and granddaughter nuclides and so on emitting radiations till radioactive

nuclide attains stability. Most of the parent and daughter nuclide have long half life (Table-4) and so

keep on radiating radioactive emissions throughout the human life.

Table-4: Radioactive elements in Himalayan Salt with Half Life Period

S. No.	Element	Concentration	Half-life Period
1.	Protactinium	<0.001 ppm	1.17 minutes
2.	Francium	< 1.0 ppm	22 minutes
3.	Astatine	<0.001 ppm	8.7 hours
4.	Promethium	Unstable	17.7 years
5.	Actinium	< 0.001 ppm	21.77 years
6.	Polonium	< 0.001 ppm	102 years
7.	Radium	< 0.001 ppm	1600 years
8.	Thorium	< 0.001 ppm	7.54×10^4 years
9.	Neptunium	< 0.001 ppm	2.14×10^6 years
10.	Uranium	< 0.001 ppm	2.34×10^7 years
11.	Plutonium	< 0.001 ppm	8.0×10^7 years
12.	Technetium	Unstable	4.21×10^6 years

d) *SES Linkage with Mortality:* Incidentally health professionals have not looked into the impact of nutrition factor on the pandemic victims. Food prices are sole driving force among lower SES and so is true in India and neighbouring countries where average daily earnings are mere US\$5-6 for survival of a family of 4-8. This meagre earning compel poor to go for cheapest staple food including raw crystal sea salt rather than the ultra refined table salt which is 6-8 times more expensive. Table-2 and Table-3 show the death toll by Covid-19. Lower SES populations were suspected to be more vulnerable to Covid-19 pandemic for reasons of:

- Weak health infrastructure,
- High rate of poverty,
- Malnutrition, and
- Poor living conditions like an unsanitary/unhygienic environment.

However, one year data from India on morbidity/mortality projected a different picture showing that high SES population from affluent urban areas were found to be affected more; these people consume ultra refined iodised table salt.

e) *Processing of salt:* Ultra refining of natural salts salt removes MMTE that contribute about 14% by weight. The US Food and Drug Administration (USFDA) have identified 60 elements of the natural salt as essential nutrients.¹³ In June 2016, the US National Research Council labelled 29 of these 60 micro- and trace-elements as “possibly” or “probably” essential and beneficial to human health; these elements include bromine, boron, chromium, calcium, copper, fluoride, iodine, iron, manganese, magnesium, molybdenum, potassium, phosphorus, selenium, silver, sulphur, and zinc. 14% fraction of natural salt comprising of MMTE that contains these 29 identified essential elements is large enough to ignore and neglect.¹⁴⁻¹⁷

f) *Suspected linkage to UN's Salt Iodization Programmes:* Global salt iodization programmes initiated by WHO and UNICEF in early 1960s with an aim to eliminate iodine deficiency disorders (IDD) mainly goitre. For example in India, the last 50 years of state sponsored programme on forced consumption of iodized salt through ban on natural sea salt could not eliminate sporadic prevalence of thyroid disorders and rather it has attained epidemic status along with other NCDs. Today, it is hard to find a family where thyroid disorder patients are not available. In India, every third Indian suffers from a thyroid disorder.¹⁸ Hypothyroidism has graduated from endemic to silent pandemic on a global scale in the last 50-55 years. In 2016, Levothyroxine (synthetic thyroxine) was prescribed to more than 114 million hypothyroidism patients in the USA alone and retained number one position in top 300 drugs sold even in 2019.¹⁹ These global observations speak loud on the failure of the fit-for-all iodization programmes. Increasing rates of incidence of NCD clearly found to follow the salt iodization growth trajectory in every country. Iodization was thought to be magic wand for IDD and every government world over were convinced for its implementation irrespective of iodine deficiency perhaps under commercial compulsions from salt industry.

It is important to discuss Covid-19 mortality in Afghanistan and India where extensive salt iodization programmes were implemented in last 50 years. Afghanistan accomplished almost 100 percent salt iodization programmes with 11 salt processing plants under UNICEF funding. Afghanistan achieved 66.2% adequate iodized salt consumption and 33.8% inadequate iodized salt way back in 2013.²⁰ On the other hand healthcare infrastructure is dismal in Afghanistan and thus reported a greater number of casualties per million compared to other countries like Myanmar, Sri Lanka and Pakistan. Among underdeveloped or poor

countries India has robust healthcare infrastructure and comparatively has higher mortality rate of 103 per million (compared to 57 per million in Afghanistan) perhaps because of dependence of larger population on pure sodium salt that is overall adequacy of 76.3% iodine in 2018-19 with only 12.7% users of the crystal salt.^{21,22}

Most of the poor population in villages of India still uses natural crystal salt due to financial constraints and hence didn't fall prey to Covid-19 at the same level as the USA or the EU. No other explanation supports such a low mortality in India where 65.97% of 1.35 billion population live in villages and deprived of adequate nourishment and no modern healthcare system; another 65 million live in extreme poverty in 33,510 unsanitary slums in metropolitan cities characterized by overcrowding and unhealthy living conditions without adequate healthcare system. Surprisingly, there are no media reports of beggars, rag pickers or sanitary worker dying of Covid-19 in India.

Even the Asia's largest Indian slum in Mumbai – DHARAVI – spread over 2.1 sq kms with a population of 0.7 million where implementation WHO guidelines of social distancing, face mask, and sanitizers was a daunting task reported only 86 deaths by 1st July 2020.²³ It was thought to be the most challenging task to contain the virus in the community where hundreds of people use the same toilet. Underlying cause for extremely low mortality appeared to be the consumption of crystal sea salt by the majority of the 0.7 million deprived class.

This hypothesis fits well to explain zero or low mortality among other poor countries like Myanmar as well distant Southeast Asian countries like Cambodia and Laos that are largely depended on natural salts. The hypothesis also explained low mortality among supposedly high risk group of elderly (>70 years) who have more exposure to natural salts during their early life span compared to youths who are wary of observing fast. The American and European populations are almost totally dependent upon highly processed pure sodium table salt deprived of trace elements compared to populations of Asia and Africa and this trend is amply demonstrated in recent mayhem caused by Covid-19 pandemic proving prophylaxis properties of the natural salts.

V. CONCLUSIONS

Sooner or later some therapeutics or vaccine for SARS-CoV-2 virus may see the light of the day but by then another epidemic or pandemic may be knocking at the door. Already another wave of infection in Wuhan, the UK, Germany and Sweden showed significant variation in the SARS-CoV-2 virus characteristics. Outbreaks of several epidemics like H1N1, H1N7, EBOLA, ZIKA and MERS occurred one after another in the past and now SARS-CoV-2 has spread across the

world. It is an unbreakable chain with a huge burden on a country's healthcare system and economy. Moreover, it is impossible to exercise WHO guidelines of social distancing etc. for long time. It has also been experienced that a host of vaccines and therapeutics developed earlier are little effective for SARS-CoV-2 infection resulting in over 1.9 million deaths till date and the situation is not likely to improve during the outbreak of another epidemic/pandemic. Hence a better and simple solution is required which is inexpensive, regular, and faster to implement. Based on radioactive properties, it is strongly experienced that regular consumption of natural salts offers the best prophylaxis solution against viral pandemic and would be helpful in improving global health. Moreover, natural salt doesn't have any harmful side effects as it was consumed and tested till a 6-7 decades ago by everyone world over for ages.

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