

Some Natural Hypomethylating Agents in Food, Water And Environment are Against Distribution and Risks of COVID-19 Pandemic: Results of a Big-Data Research

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Abstract

Objective:

Investigation on the effects of lifestyle, nutrition and diets on the status and risks of apparent COVID-19 Infection in families.

Materials and methods:

We conducted a somehow big questionnaire survey from more than 11000 Iranian families (resident in more than 1000 different urban cities and rural points inside IRI) and a somehow big-data COVID-19 and Life-Style data-store was provided from it. This big-data includes records about Life Style effects (including nutrition, water consumption sources, physical exercise, Smoking, Age, Gender, Health and Disease Factors, and many other items) on the status of COVID-19 Infection in families (i.e., residents of a home).

Results:

Our results strongly suggest that the foods and water-sources which are containing some natural hypomethylating agents are lowering the risk of apparent infection of COVID-19. Furthermore, our computations on billions Permutations of nutrition conditions and dietary regime items, based on data from people's diet and infection status, show that there are many diet conditions that are lowering the risks of apparent COVID-19 infection by 90 percent reduction, and there are some diet conditions that increasing the risks by a factor of 3 or more.

Conclusion:

Some natural hypomethylating agents in food, water and environment are against distribution and risks of covid-19. Furthermore, there are many diet conditions that are lowering the risks of apparent covid-19 infection by 90 percent reduction, and there are some diet conditions that increasing the risks by a factor of 3 or more. We hypothesized a model to explain the results.

Keywords:

COVID-19, Nutrition, Risk, Questionnaire Survey, Hypomethylating Agents, Big-Data

Introduction

After world-war-2, the COVID-19 pandemic has been the most catastrophic event in the world. Many researchers are trying to solve the complex-multifaceted aspects of this pandemic. Life-style (and its effects on the risks in a pandemic) is one of these aspects.

Materials and Methods

We conducted a somehow big questionnaire survey from more than 11000 Iranian families (resident in more than 1000 different urban cities and rural points inside IRI) and a somehow big-data COVID-19 and Life-Style data-store (with more than 1M data-Records and more than 1G-Items which could be yielded by acquiring semantic entailment rules) was provided from it. This big-data includes records about Life Style effects (including nutrition, water consumption sources, physical exercise, Smoking, Age, Gender, Health and Disease Factors, and many other items) on the status of COVID-19 Infection in families (i.e., residents of a home).

Findings and Results

Our results strongly suggest that the foods and water-sources which are containing some natural hypomethylating agents are lowering the risk of apparent infection of COVID-19:

- Some phytochemicals like curcumin (richly found in turmeric¹), Trigonelline (richly found in coffee), and some others. In addition to their hypomethylating effects, these natural bioactive phytochemicals act as anti-oxidative and anti-inflammatory agents. So these natural compounds could act against oxidative stress and the cytokine storm which play an important role in sever phases of COVID-19 infection (lung injuries, Internal bleeding, and ...).
- Some Metals and Minerals in our body (such as Calcium, Magnesium, Zink and ...)
- Some naturally occurring bio-concentrations of some heavy metal ions in food\water\environment.
- Islamic Fasting for some consecutive days, which has hypomethylating and anti-inflammatory effects [14] and in our data, was observed to reduce the risk of apparent infection of COVID-19.
- Natural Honey and its bioactive materials.
- Trigonella foenum-graecum and its products
- Coffee, especially Intense Arabic Coffee, and other Coffee, and any source of Trigonelline. (Note: Some countries with very high and intense consumption of coffee (like Laos, Luxembourg, Qatar and Oman), have a very low Case-Fatality Rate in COVID-19 Pandemic. There is a correlation between Coffee Consumption and lowering the case-fatality-rate for countries with more than 5kg annual per capital coffee consumption, Figure-1).
- Fruits Natural Products and especially Grape syrup and fruit-roll, fruit leather, and any source of Trigonelline and divers Alkaloids.
- Somehow, some Tea, and any source of divers Alkaloids.

- ...

Also, in the next level after previously mentioned bioactive materials, our results strongly suggest that these foods, vitamins, and minerals are lowering the risk of apparent infection of COVID-19:

- Probiotic Dairy Products
- Vitamin D
- Natural Sources of Vitamin C
- Some Natural Sources of Vitamin B3 (excluding the fish meat)
- real Sea Salt (not purified, not filtered)
- ...

And finally, our results strongly suggest that these foods are highly improving the risk of apparent infection of COVID-19:

- sugar substitute, Artificial sweeteners
- Fish Meat and some other sources of Phosphorous and Phosphate (such as residues of phosphate fertilizers in some fruits and foods and Surface runoff waters)
- Sugar
- Soft Drinks and Soda (Rich in Phosphorous, Anti-Calcium, Rich in Sugar)
- Fast Food
- Pumpkin
- Deep frying or fried Foods
- Western Diet and other not healthy diets.
- The People who were preventing their bodies from mild influenza and common-cold infections in previous fall season, really were in a higher risk level in our data results.
- ...

Our computations on billions Permutations of nutrition conditions and dietary regime items, based on data from people's diet and infection status, show that there are many diet conditions that are lowering the risks of apparent SARS-Cov-2 by 90 percent reduction, and there are some diet conditions that increasing the risks by a factor of 3 or more.

The Proposed Model

We hypothesized a model to explain these results:

Some natural hypomethylating agents (in their simple form or complexes, such as Alkaloid-Metal complexes) could attach to viroporins (and other viral proteins) and virus RNA: to mark them, disrupt their functionalities, destroy their sequences and hack the cybernetics of the viral information that are encoded in them. After all, the cargo mechanisms and cargo proteins that act naturally on the hypomethylating agents in a cell and cell-membrane (such as Heavy metal pumps, Arsenic pumps, intercellular RNA transport mechanisms, and ...) could export and deport the hostile virus RNA from the cell cytoplasm.

Related Works

Many studies, based on in-silico, in-vitro, in-vivo and some clinical trials suggest phytochemicals (like Curcumin, Trigonelline, Emodin [1], Vanillin and ...) could act against various phases of virus entry, infection and the consequences (like inflammation ([15] and [16]) and oxidative stress [12] [13]). Some previous researches suggest that Zinc, Cu or even ppb concentrations of Arsenic, could act against SARS-Cov and SARS-Cov-2 infections. The existence of some risk factor or inhibiting agents of SARS-Cov infection in environment[2][3][4] [6] [7] [10] [11], food [20][29] and diet[30], water and some natural [8] or pseudo-natural compounds [9] has been reported in the previous and recent studies. The existence of some Phylogenetic and race risk factors for COVID-19 [18][17] [19] indicates the probable role of systems biology and epigenetics [31] in fighting COVID-19. Traditional Medicines (Like ITM [25] [28] and TCM [26] [27]) have some common aspects with our data-driven observations.

The human ACE2 transmembrane protein [5] is also another point that the natural polypeptides of metal-alkaloids could ban the entry point of corona viruses to the cell. Zinc, Cu and Arsenic are some heavy metals that could construct polypeptides [21] from Trigonelline and some other small molecules.

Some previous and recent studies support this model. The metabolomics studies of COVID-19 hospitalized patients in USA (Seattle) [22] and China (Wuhan) [32], in two separate studies, show that the Trigonelline in patients' blood have a RR<1 for Covid-caused severity and death. This could be interpreted as a protective effect of Trigonelline.

Data Availability

A subset of our data is available from: <https://data.mendeley.com/datasets/y37mz23vyv/2>

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Appendix 1: Tables and Figures

Note: some items are added after the survey began and during it, so the number of involved questionnaires are different. According to our observations, the green rows are lowering the risk of COVID-19 apparent infection, and according to our observations, the red rows are increasing the risk of COVID-19 apparent infection.

Factor in Family LifeStyle	Observed COVID-19 apparent Infection Risk Change (in %)	Relative Risk ² (RR)	Statistical Significance due to 99.9% Confidence Interval	Statistical Significance due to 95% Confidence Interval	Number of Questionnaires
Turmeric	-87	0.45	Yes	Yes	More Than 11K
Black pepper	-65	0.51	Yes	Yes	More Than 11K
Islamic Fasting for entire Ramadan	-61	0.55	Yes	Yes	About 10K
Cinnamon	-59	0.55	Yes	Yes	More Than 11K
Legume and chickpea	-52	0.55	Yes	Yes	About 5K
Dark chocolate, dark cocoa	-50	0.54	Yes	Yes	About 3K
Bell pepper	-48	0.59	Yes	Yes	More Than 11K
Tea	-48	0.66	Yes	Yes	More Than 11K
Sea salt	-48	0.57	Yes	Yes	About 10K
Vitamin D or Multivitamin Tablets	-46	0.62	Yes	Yes	More Than 11K
Walnuts or Nuts	-46	0.62	Yes	Yes	More Than 11K
Consuming Rose Water Once a Few Days In Food Or Drink	-46	0.60	No	Yes	About 5K
Fruits natural products: Grape Syrup	-45	0.61	Yes	Yes	About 5K
Daily yogurt consumption	-45	0.64	Yes	Yes	About 10K
Tahini and natural products like it	-44	0.61	Yes	Yes	About 10K
Low or controlled consumption of oil	-44	0.62	Yes	Yes	More Than 11K

² or Risk Ratio

Consume Courgette once every ten days	-44	0.59	Yes	Yes	about 5K
Garlic	-42	0.65	Yes	Yes	More Than 11K
Consume Eggplant once every ten days	-42	0.64	Yes	Yes	about 5K
High consumption of fruits and vegetables	-41	0.67	Yes	Yes	More Than 11K
Natural Honey	-41	0.67	Yes	Yes	More Than 11K
Green pea	-38	0.63	No	No	About 5K
Ginger	-36	0.68	Yes	Yes	More Than 11K
Fruits natural products: fruit-roll	-35	0.67	Yes	Yes	About 10K
Local dairy products	-33	0.71	Yes	Yes	More Than 11K
Daily coffee consumption	-33	0.69	Yes	Yes	More Than 11K
Traditional breads (whole-wheat flour)	-32	0.71	Yes	Yes	More Than 11K
Soybean and its products	-32	0.70	No	Yes	About 5K
Head Cabbage	-31	0.69	No	Yes	About 10K
Islamic fasting, once a week	-31	0.69	No	No	About 10K
Vegetarian diet	-29	0.71	No	No	About 10K
Probiotic dairy products	-25	0.76	No	Yes	More Than 11K
Slimming weight loss diet or low-calorie diet	-24	0.77	No	No	About 10K
Non-alcoholic beer	-21	0.79	No	No	About 5K
Physical exercise and walking	-19	0.82	No	Yes	More Than 11K
Tobacco and smoking	-15	0.86	No	No	More Than 11K
High consumption of apple juice or apple	-14	0.86	No	No	About 5K
Home water purification devices	21	1.23	No	Yes	More Than 11K
High consumption of deep frying or fried foods	24	1.25	No	Yes	More Than 11K
Soft drinks and soda	24	1.25	No	No	About 3K

High consumption of sugar	26	1.27	No	No	About 3K
Monthly consumption of fish meat or seafood	27	1.31	Yes	Yes	More Than 11K
Weekly consumption of fish meat or seafood	28	1.30	Yes	Yes	More Than 11K
High consumption of sweet pepper (not bell pepper, excluding bell pepper)	37	1.37	No	Yes	About 10K
Eat fish meat or seafood once every two or three days	42	1.44	Yes	Yes	More Than 11K
High consumption of fast food	45	1.46	Yes	Yes	More Than 11K
Pumpkin	49	1.5	No	Yes	About 3K
Sugar substitute, artificial sweeteners	60	1.62	Yes	Yes	More Than 11K

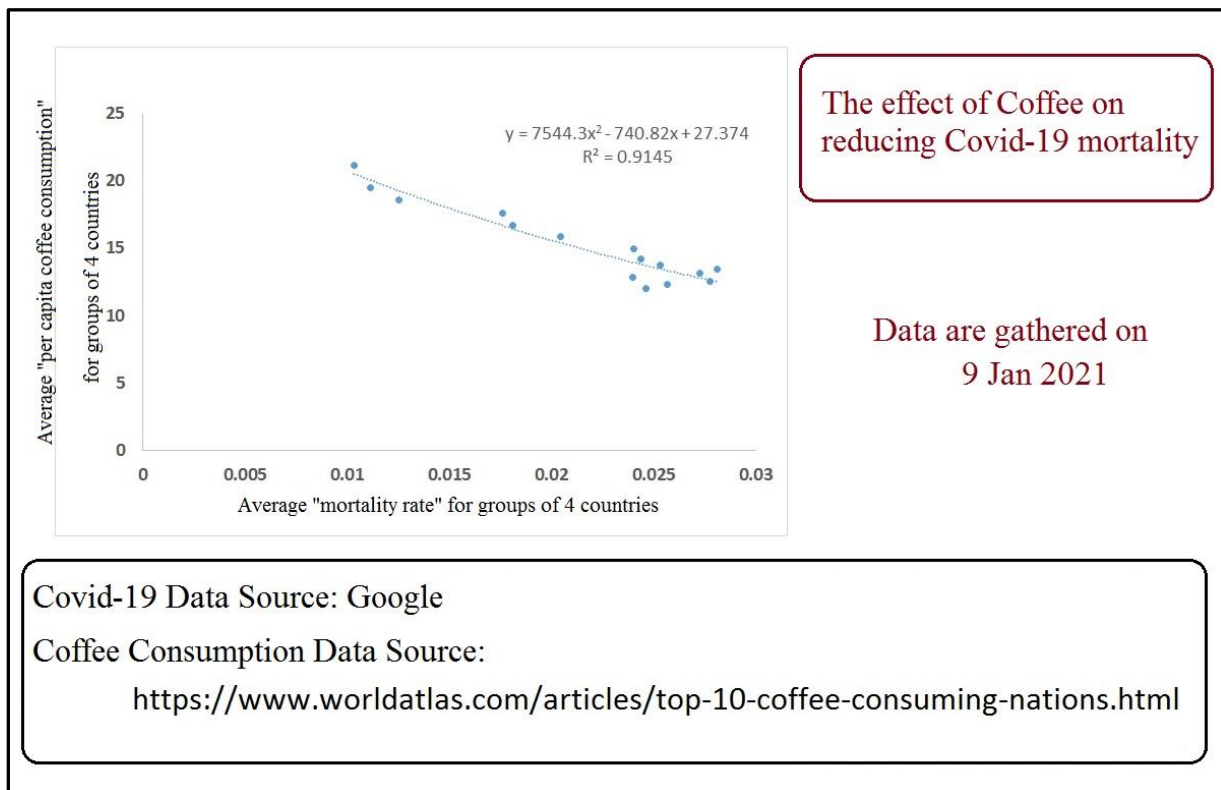


Figure 1- The effect of Coffee on reducing COVID-19 Mortality in groups of 4 Countries. We consider only the countries with more than 5kg per-capita annual Consumption of Coffee.