



Packed Foods Related to COVID-19

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Abstract

COVID-19 prevalence and mortality in South & East Asia & Africa is much lower (88%) than in the Europe & northern America. This may relate to higher immunity in the low income people due to (a) less consumption of fast/ packed/ refrigerated food, beverages, liquor, tobacco, meat, HFSS- high fat, salt, sugar in Asian (b) higher exposure to microbes, (c) more exposure to sunlight & higher vitamin D levels, (d) less vaccination (general/ BCG). South Asian spice intake is also double the world average and is considered healthy. Spices contain Salicylate and may cause Aspirin like effect, the key anti-inflammatory drug for Corona. Mustard is anti-viral and may be useful too.

Keywords: Salicylate; Spices; Polyphenols; Immunity; COVID-19

Introduction

Corona i.e. COVID-19 has harmed the socio-economic peace the most since is known to have hit richest countries the hardest such in the north America & Western Europe, with significant positive correlation with GDP per capita, amongst other factors [1-3]. Other important correlates of COVID-19 prevalence as per these studies include Age, international travel, BMI, comorbidities, BCG vaccination. There is also possibility of diet correlation to it, as indicated by Ghate & Kulkarni [4] suggesting spice and vegetarian diet rich in polyphenols possibly explaining lower Corona incidence and mortality in India than the western nations. This is re-examined here as COVID-19 intensity is low in India's neighbors and few south east Asian countries that are predominantly not vegetarian. Among the diet factors that damage the immunity the role of processed foods is well documented, besides intoxicants such as Tobacco, Liquour. So we examine here the relation between extent of processed food consumption and COVID-19 intensity across western nations and South/ East Asian nations besides few African

nations as preliminary study.

Materials and Methods

The COVID-19 intensity is measured using 3 parameters- (a) prevalence- no. of patients/ 1 million population, (b) mortality- no. of deaths/ 1 million population, (c) mortality as % of cases. These data are based on last 2 years cumulative numbers cited on 19th March 2022 at www.worldometers.info/coronavirus/.

The income level data of countries is obtained from the World Bank open database- (<https://databank.worldbank.org/data/download/site-content/CLASS.xlsx>) and data on agri-GDP as % of total GDP also (<https://api.worldbank.org/v2/en/indicator/NV.AGR.TOTL.ZS> for the year 2019-pre-COVID-19. For, country-wise data on % of agri-produce processed i.e. value added was not available but the above parameter is used as it proxy as the 2 are inversely related as developed countries process majority of their crop produce and have lower share of agriculture in GDP due to

many other industries & services dominating in it, unlike in India or other developing countries where agri-processing is minimal but agriculture occupies leading share in GDP.

Results and Discussion

India is the 2nd most infected after USA (cases- 0.24 million/ million population i.e. 24% of people, deaths- 2,976/ million people). But India's COVID-19 prevalence (30,648) and deaths (368) are only 12% of the USA. It is only 20% and 35% of the average of (146,128 and 1,051 respectively) selected 26 countries respectively. This indicates higher immunity of the Indian is higher as there is no specific drug for COVID-19 yet. India's south & east Asian neighbours are also similar. So we need to analyze the plausible reasons of higher immunity of south/ east Asian nations.

Immunity is known to be compromised by the higher consumption fast/ packed foods, refined carbs, intoxicants, higher salt, sugar, fat etc [5-7]. We find the immunity stress foods consumed in 2-30 times in EU/ USA (average 9 times intake) than India [4].

There is modest positive correlation ($r^2 = 0.681$, $y = 11067x - 18164$) of COVID-19 prevalence across with income levels vide World Bank dataset, as also shown earlier by Chatterjee [8] and Ferreira [1]. However, agriculture income as % of GDP prevalence across selected nations is also correlated ($r^2 = 0.5$, $y = -12666x + 25144$). The gross death rate (deaths/ 1 million people) is weakly or not correlated to income levels ($r^2 = 0.01$) as patient's care & survival rate is much better in richer countries than the poorer due to better medical facilities such as oxygen respiration & ventilators.

Immunity Diet

The immunity damaging foods consumption especially refined carbohydrates & fats are very high in EU-USA & allied nations than India and perhaps south/ East Asian/ African nations. The latter are have low incomes and still mostly eat home cooked, fresh food, neither refrigerated nor packed/ in hotels. This may have helped retain higher immunity here than the western nations, besides factors below. The packed/ commercial foods are high in HFSS (high fat, salt, sugar) that may compromise immunity in the western countries [6,9,10]. Processed food may have allergens & other health risks [11].

Spices- Indian spice consumption, rich in polyphenols, is 2 times higher (2.07 kg/head/year) than the global average (1.01 kg/head/year, Ferrucci [12]). This may be resulting in lower cancer incidence (89 per 0.1 million) in India [13] is 50% of the global average (197) or just 25% of the EU (363) or USA (387). Asthma incidence, a major respiratory ailment and immunity indicator is similarly low in India with below

10% population affected but higher levels in the European nations- 20 to 25% [14].

Spices are also known to contain Salicylic Acid and are responsible for aspirin like medical effect [15]. This may explain the efficacy of drinking spice decoction resulting in much lower intensity of COVID-19 in India than the western countries [4].

However, the spice consumption in India varies greatly across states and economic strata or ethnicity and has changed over times much. Chilli for instance, has replaced black pepper, common earlier for adding pungent flavor and changed the world history as European discovered India for the later. The former is not reported to be anti-bacterial but not antiviral while the latter is an effective antiviral [16]. Similarly, Chilli is consumed more in northern India while Black Pepper mainly in southern India- its main producer region- and the later also has lowest COVID-19 fatality rate in India- 1% of patients. Chilli comprises nearly 20% of the 5 gram/day/head spices consumed, and Turmeric, Ginger, Mustard, Coriander, Cumin are nearly equal, the 5 adding to 80% of the spices consumed on average in India [12]. Ginger Chang [17] & Turmeric are also anti-viral Kunnumakkara [18] but other antiviral spices are consumed to lesser extent viz. Cinnamon, Clove and Garlic [19]. Elsayed & Khan [20] show the negative consumption of spices consumption extent with corona incidence across 163 countries indicating the immunity boost by spices. Ghatge & Kulkarni [4] (ibid) enlist the bioactive principles in various spices that could reduce the COVID-19 risk. Eapen [21] reported higher resilience of spice mix drink consuming people including elders to COVID-19. Govt. advised people to daily consume spice decoction ("Kadha" in vernacular, Anon [22]). Its rationale and working mechanism is also explained by scientists theoretically Sharma [23] and through actual field data [24]. Mustard oil, common in northern India is antiviral & SARS inhibitor [25], unlike Groundnut in western India, a known allergen.

Other factors

- Vitamin D deficiency is found to cause higher COVID-19 risk vide studies [26]. As majority of the Indians work in the sunlight in the farms or on traffic or as roadside petty shops, their vitamin D status may be better. Majority of the US & EU population on the contrary spends much time in houses or offices or cars that are air conditioned and lack sunlight. This could have compromised their immunity. Vitamin D deficiency is reported to haunt 40% of Europeans and about 20% Indians [27].
- "Exposure" to higher microbial load is another hypotheses to explain lower COVID-19 intensity in India/ Asia than in the Europe & America, due to the poor hygiene in the

former countries [28].

- Genetics may also have role in immunity [29]. Asians got a protein D614 mutation, making them stronger than the Europeans [30]. (e) BCG vaccine for TB in India/ developing countries is opined to cause higher resistance to Corona virus [31]. (f) Lower incidence may be partly due to under-reporting but the same may not apply to death due to COVID-19.

Conclusion

COVID-19 prevalence and mortality in South & East Asia & Africa is much lower (88%) than in the Europe & U. S. A. probably due to the higher immunity in the low income people. For, the poorer people show (a) less consumption of fast/ packed food, liquor, tobacco, meat, HFSS- high fat, salt, sugar, (b) higher exposure to microbes, (c) more exposure to sunlight & higher vitamin D levels. South Asian spice intake is also double the world average and may be healthy due to Salicylate content- with Aspirin like effect.

Declaration

We declare no conflict of interest. This manuscript was not published as such elsewhere before and has some unique and novel sections.

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