

Viral Epidemics in India: Joining Hands to Win the Battle

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India witnesses number of viral epidemics every year. Some of these occur regularly during the post rain months and stay till the onset of winter whereas some other appear on a biannual or triennial mode. No matter how and when they appear; they always carry a baggage full of misfortune for their hosts and go deserting them of their lives, money and strength to severely incapacitating levels.

The history of such epidemics is much old in India. Dengue has been recognized in India since as early as 1940 (1). The difference in history and present is only in getting a better acquaintance of them now comparing to the early times. Instead of considering them as simple viral fever alone, now we know them all by their specific names. What difference this acquaintance has created in their management however is still a question to be reviewed honestly. For a common concern, these undesired guests look more dreadful and obnoxious now than they looked to be in yester years.

There are number of such diseases, often occurring one by one or in concert tormenting the whole geographical area. Swine flu, Dengue, Chikungunya, Japanese Encephalitis (JE), Hepatitis are just a few to name these unwanted regular visitors in Indian households. Seeing repeated outbreaks of fevers, India is often called in the throes of fever outbreak or a palace of diseases of tropical depression (2). Recent outbreaks of JE concurrent with Dengue and Swine flu have become symbolic to the inadequacy of all measures which are being taken so far to offer an effective curb to their spread.

Management of such diseases basically revolves around three factors, the host, pathogen and the vector. Mosquito acts as a vector to most of such virus born diseases and hence dealing with their spread during their breeding season could be one tangible measure to reduce their menace. Such measures may involve the reduction of breeding opportunities for mosquito, trapping or killing the larvae or adults by mechanical, chemical or biological means and preventing oneself actively from any prospective mosquito bite (3). Various novel biological approaches to control spread of mosquito are on the way. Infecting the mosquito with *Wolbachia pipientis*, a bacteria supposed to reduce the life span of a mosquito and using *Bacillus thuringiensis israelensis (Bti)*, a naturally occurring soil bacterium able to kill mosquito larvae present in water are such promising methods. These all measures if adopted collectively on a mission mode, may certainly give rise a visible reduction in the occurrence of mosquito careered epidemics. Many herbs and their extracts are also being evaluated for their larvicidal and pupicidal roles (4). Factually, integrated mosquito management (IMM) is a growing concept adopting the alternative means of mosquito eradication in order to avoid the resistance generated by synthetic methods. Interestingly, most of the herbs evaluated for such actions are the known herbs used for their medicinal values in Ayurveda. This is not difficult to postulate that a dose having therapeutic value for human, may prove to be lethal for smaller organisms by virtue of the same property.

Killing the virus inside the host could be another viable option to win the battle. Although theoretically promising,

this actually is a hard task owing to special powers owned by most viruses. Their multi strains, capacity of altering the host defense mechanism and ability to defy the host defense are the reasons why there are no effective vaccines or drugs available so far which can kill the viruses in the body. The works are however on their way and we hope to expect something good to happen soon. Virus mechanisms utilized to overcome the host barriers for their replication in the macrophage and the mechanism to inhibit key host defense pathways is a promising avenue to be unearthed which may result in development of effective antiviral drugs in future (5).

From the host perspective, this is important to strengthen the host defense to counter any intrusion of virus or bacteria and also to render the pathogens weak and hence being unable to cause a disease. Unfortunately very little has been thought and lesser been done scientifically on this paradigm of the viral disease management so far. There are substantial problems in developing a drug or vaccine for many viral diseases like Dengue. Dengue virus has four serotypes in contrast to Chikungunya which has only one serotype. It is for this reason; a self immunity develops in the later after it occurs once in a person. Will it not be a promising avenue to strengthen the host in order to defend him from any sort of viral attacks? We are aware that host factors play a crucial role in the progress of a viral disease. Identifying those factors has been an area of high interest to most virologists in order to develop an effective medication for viral disease by offering the counter therapies to mitigate viral replication (6).

Traditional health care systems have much to offer in this area. Ayurveda , for instance, consistently talks about considering the disease management in the continuum of host and the pathogen. The management for a disease as per ayurveda is actually tailor made on the basis of net strengths of host and the offender. For all kind of infective diseases, a universal law of opportunism is observed. An infective disease commonly occurs only when host is weak physically, mentally, emotionally or in any other

dimension which matters to the host defense. Any kind of stress renders us susceptible to infections, of which the causatives are already all around. They just had waited till the opportune time, when the host defense is vulnerable. Common cold is a wonderful example of this phenomenon. It always happens during the change of weather when the body is not acclimatized to the rapid changes in temperature, a sudden change in temperature triggers the viral activation and a weekend defense allows them to replicate. This is how a viral pathology sets in. Seasonal regimes of ayurveda are wonderful proposals of protecting ourselves not only from viral but all sort of opportunistic infective diseases. Observing a contentfull life, further helps building the general immunity.

There are number of herbal remedies recommended for variety of viral illnesses. Conventionally, post rainy season is characterized by a reduced *agni* and vitiated *vata* which makes a ground for setting in of *vata* fevers. Besides observing precautions specified for this particular season, consuming the herbs which can promote *agni* and reduce *vata* may essentially be helpful to counter viral illness. At the same time, the caution is for not consuming any food or drink which is *kapha* promotive. Too much oily, cold and difficult to digest food therefore should be avoided in this weather. Drinking hot water, taking light and warm meals, avoiding day nap and exertion can be the key to remain healthy in this weather.

There had been number of studies supporting role of various plants in mitigating viral infections at various stages (7). Neem (*A. indica* Linn.) bark aqueous extract demonstrated potent entry inhibitor activity against dengue virus type-2 infection. Many other plants like Haridra, Tulasi, Dadim , Chirayata and Bhumyamalaki have also shown their anti viral properties in different usage forms against different strains of viruses. The aqueous extract and freeze-dried powder of dadima (*P. grantum*) has shown promising antiviral activity (8). Dadim fruit is well known in ayurveda for its *tridoshaghna*, *jwara hara* and *dipana* properties. This can therefore be a promising restorative

in cases of fevers of viral origin.

Use of papaya leaf juice in managing dengue hemorrhagic fever is of concurrent importance these days. Papaya (*Carica papaya*) leaf extract (CPL) is anecdotally recommended in cases of dengue for its possible role in raising platelet counts. Animal studies suggest that papaya leaf extract has potential therapeutic effect on disease processes causing destabilization of biological membranes as they inhibit hemolysis *in vitro*. CPL has been tried for its potential use in Dengue in many parts of the world where Dengue occurs in the form of epidemic. Although being tried empirically so far as a possible remedy to thrombocytopenia associated with Dengue, two studies recently published at JAPI need special mention for their meticulous, scientific and rational approach to find therapeutic utility associated with CPL in cases of Dengue induced thrombocytopenia. The first study by Kasture PN et al (9) is a double blind controlled multicentre study demonstrating benefits of CPL (1100mg thrice a day) given for 5 days in addition to standard therapy. Benefits were observed in the form of a better platelet count and less requirement of platelet transfusion among the intervention group. The other single center, randomized study by Gadhwani AK et al (10), included 400 patients of dengue tried much less amount of CPL (500 mg once a day) . It was also able to demonstrate reduced need of platelet transfusion among intervention groups and reduced days of hospitalization required among people received intervention. These studies were possibly first studies in India which tried to validate the empirically tried folk medicine in the purview of science to make a better use of such claims. Unfortunately, ayurvedic fraternity in India is still lagging behind to generate more evidences of similar kinds to validate their principles and practices in order to make their better use in the society. What we wish to reiterate here is that if the loads are big enough to be shouldered by someone alone, let others join their shoulders to share the load to finish the task effectively. Joining hands for a defeating a common enemy, should be a common

approach of every health care system in order to reach at their goals of offering a cure to the client, whether achieved alone or with the help of a kind friend. Let Ayurveda should also come forward to play more decisively all possible roles it can play at health care ground. What important is that everyone needs to play.

References

1. Barraquer IR , Solomon SS, Kuganantham P, et al., The Hidden Burden of Dengue and Chikungunya in Chennai, India, available at <https://doi.org/10.1371/journal.pntd.0003906> (Last accessed on 25.9.2017)
2. Biswas S, Is India in the throes of a fever outbreak? Available at <http://www.bbc.com/news/world-asia-india-37415781> (Last accessed on 24.9.2017)
3. Controlling Dengue outbreaks , available at <https://www.nature.com/scitable/topicpage/controlling-dengue-outbreaks-22403714>(Last accessed on 25.9.2017)
4. Ghosh A, Chowdhury N, Chandra G. Plant extracts as potential mosquito larvicides. *The Indian Journal of Medical Research*. 2012;135(5):581-598.
5. Reis AL, Netherton C, Dixon LK. 2017. Unraveling the armor of a killer: evasion of host defenses by African swine fever virus. *J Virol* 91:e02338-16.<https://doi.org/10.1128/JVI.02338-16>
6. Hsu T-H, Spindler KR. Identifying Host Factors That Regulate Viral Infection. Condit RC, ed. *PLoS Pathogens*. 2012;8(7):e1002772. doi:10.1371/journal.ppat.1002772.
7. Jadhav P, Kapoor N, Thomas B, Lal H, Kshirsagar N. Antiviral Potential of Selected Indian Medicinal

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(Ayurvedic) Plants Against Herpes Simplex Virus 1 and 2. *North American Journal of Medical Sciences*. 2012;4(12):641-647. doi:10.4103/1947-2714.104316

8. Lin LT, Chen TY, Chung CY, Noyce RS, Grindley TB, McCormick C, et al. Hydrolyzable tannins (chebulagic acid and punicalagin) target viral glycoprotein-glycosaminoglycan interactions to inhibit herpes simplex virus 1 entry and cell-to-cell spread. *J Virol*. 2011;85:4386–98
9. Kasture PN, Nagabhushan KH, Kumar A. A Multi-centric, Double blind, Placebo controlled,

Randomized, Prospective study to evaluate the Efficacy and Safety of Carica Papaya Leaf Extract, as empirical therapy for thrombocytopenia associated with dengue fever. *J Assoc Physicians India* 2016; 64:15-20.

10. Gadhwal AK, Ankit BS, Chahar C, et al. Effect of carica papaya leaf extract capsule on platelet count in patients of dengue fever with thrombocytopenia. *J Assoc Physicians India* 2016; 64:22-26.

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