



**IASTAM CONCLAVE -
'AYURVEDA AND VIRAL DISEASES:
TRANSLATIONAL MODALITIES**

**Inputs from Participants and Experts and for the
'Interactive and Q & A Sessions'**

**ORGANIZED
BY**

**INDIAN ASSOCIATION FOR THE STUDY
OF TRADITIONAL ASIAN MEDICINE**

DECEMBER 13, 2020

Opinion/Views/Questions

IASTAM Conclave “Ayurveda and Viral Diseases. Translational Modalities”

~ Proposed Guidelines ~

- Several participants have expressed desire to speak or present their views
- We had requested all to provide their inputs either in a brief narrative or bullet points.
- These inputs received till noon of 9th December 2020 have been included and are being circulated herewith as background material.
- Senior experts and their inputs received in the form of questions or points for the discussion are also being circulated.
- The objective is specified in the Flyer Circular and earlier communications.
- The Experts and Moderators will interact *pre-conclave* to evolve right set of observations and questions to be followed on the day of the conclave.
- Moderators will coordinate the sessions to provide background on the theme, subjects, and raise questions aimed towards developing translational modalities as proposed.
- The participants who have submitted their views will be given priority during the interactive-sessions.
- The participants are requested to –
 1. Avoid Repetition of the Subject or background
 2. Be as precise as possible
 3. Significance of observations or suggestions is needed to be highlighted
 4. Focus on the point that one wishes to share views or give suggestions
 5. Observations or suggestions should be to either raise a specific issue worthy of discussion or should be conclusive in nature.
 6. Focus should be on giving specific action-oriented suggestions rather than generalised statements to help develop ‘Translational Modalities’.
 7. Observations or suggestions be accompanied with means or methods to implement it

You may share your views in brief as per the flow -

Observation / Suggestion > Justification to the Theme of the Conclave or its Subset > Significance > Means / Method > Expected Outcome > Utility / Use / Applicability.

THESE GENERAL GUIDELINES ARE *PROPOSED* TO HELP CONDUCT THE CONCLAVE IN A PRODUCTIVE MANNER.

EXPERTS WITH THEIR VAST EXPERIENCES WILL GUIDE DERIVE SOLUTIONS.

THE MODERATORS WILL TAKE NECESSARY STEPS TO DRIVE THE DELIBERATIONS.

Opinion/Views/Questions

1. **Dr. V. M. Katoch**, *Former Director General, Indian Council of Medical Research, New Delhi*
ICMR- NASI Chair on Public Health at RUHS.

- Which are conditions where there is historical evidence of effectiveness of Ayurveda and other AYUSH systems for viral diseases?
- What are published recent studies in viral diseases important from public health context?
- Any Inter-phase studies with modern allopathic medicine?
- Why these experiences have not become broadly known or acceptable?
- What should be done in the current scenario?

2. **Dr. Ashok D.B. Vaidya**, *Research Director, Kasturba Health Society-Medical Research Centre,*
Director, Clinical Pharmacology, BSES & Global (BK) Hospital.

Session 1- Interpretation of Viral Infections & Understanding of Viral Diseases

- (1) What are the phenomenological descriptions of infectious diseases in Ayurveda? How do these correlates with the current clinical symptoms-signs profile of viral diseases?
- (2) How can *Dinacharya*, *Ritucharya*, *Achara-rasayana* and *pragnyaparadha* / *vegavarodha* influence immunity and reduce the incidence and prevalence of viral diseases?
- (3) How can we apply translational research to *Shad-vidha Samprapti* to viral diseases?
- (4) What are the characteristics of *Rasayana* and effects beyond immunostimulant?
- (5) What way should we introduce the advances in modern virology in Integrative undergraduate medical education, envisioned by the Niti Aayog?

Session 2- Approaches and Practical Solutions to Viral Infections

- (1) How were AYUSH trials conducted during the COVID-19 pandemic? What were the objectives?
- (2) There are several approaches proposed for therapeutic research (TR) in Ayurveda like the Matrix Model. Ayurvedic Pharmaco / Therapeutic Epidemiology, Observational studies, Reverse Pharmacology, Network Pharmacology, *Dravyaguna*-based evaluation, and Interdisciplinary Pharmacology. What approaches are more suited for TR in viral diseases and why?
- (3) How many Ayurvedic and modern physicians have a robust training in viral diseases, as to their etiological agents, differential diagnosis, prognosis, management and complications so that they can conduct research in these diseases?
- (4) What are the most pragmatic and practical approaches to decrease morbidity and mortality in viral diseases, without much regulatory and red-tape loaded ethical approvals?

Session 3- Evolving Working Modalities for viral diseases

What are the Universities, Institutions, R&D networks and Research Centres which have a distinguished record of working for viral infections in an integrated approach? These can be fully supported and strengthened for a readiness to conduct transdisciplinary research, on a fast track, as soon as a new viral epidemic strike.

- (1) What strategy and action plans have to be evolved to assuage the intersystem rivalry and mutual distrust, while treating viral diseases, in the best interests of individual patient and the community?
- (2) Can the new education policy inculcate the right attitudes, skills and knowledge in students about hygiene, sanitation, and infectiousness of viruses, from the primary education onwards?
- (3) How would we develop a national pandemic disaster plan with readiness to meet eventualities?
- (4) What weightage can be given to non-drug, drug, and vaccine modalities as to their rightful place in the prevention and management of viral diseases?
- (5) Can we shortlist, consensually, Ayurvedic plants and formulations which enhance immunity, have antiviral activity, and suppress the inflammatory cytokine storm? How much are the phytoactive structure-activity, *in silico*, relevant?

3. Dr. Shriram Savarikar, *Chairman, Scientific body, Pharmacopeial commission of Indian Medicine and Homeopathy, Government of India; Former Advisor, Department of Indian system of medicine and Homeopathy; Former Vice chancellor, Gujarat Ayurved University, Jamnagar*

1. Categorization of the Viral diseases in Ayurvedic context
 - i) *Santarpanajanya / Apatarpanajanya*
 - ii) *Nija / Agantuka*
 - iii) *Amashayasamuttha / Pakvashayasamuttha*
 - iv) *Vataja, Pittaja, Kaphaja or Tridoshaja / Sannipatika*
 - v) *Jvara / Kasa / Shvasa* in the context of Viral disease specifically COVID
 - vi) Role of *Agni: Jatharagni, Dhatvagni and Bhutagni* in pathogenesis of Viral diseases
 - vii) Viral disease - an infectious disease or a result of immune deficiency in Ayurvedic perspective?
2. *Shatkriyakala* and Viral diseases
3. Status of individuals susceptible to viral disease prone in Ayurvedic perspective
 - i) COVID negative healthy but susceptible to COVID
 - ii) COVID +ve asymptomatic with co-morbid conditions
 - iii) COVID+ve symptomatic mild, moderate and severe
 - iv) Covid+ asymptomatic

4. Understanding difference between *Vyadhikshamatva* and Immunity
5. Role of *Langhana, Pachana, Brimhana, Rasayana* in management of viral diseases.
6. Research approach: How relevant it to conduct research to find immunity booster and antiviral drugs in Ayurvedic perspective?

4. Prof. Dr. Madan Thangavelu, *Genome Biologist, United Kingdom, Cambridge*

- Bridging the divide between the ancient and the modern sciences. Challenges, opportunities, mechanism / modalities
 - Immunohealth: The ancient and modern perspectives – dissecting the viral infection and understanding appropriate sub-cellular, cellular, tissue, organ and whole organism approaches for interventions
- Health of the immune system over the life course: Lesson from contemporary understanding to inform the ancient and vice versa
 - The immune system in infections: Viral, bacterial, fungal, nematode*
 - The immune system in sterile inflammation*
 - The immune system and inflammation in aging*
 - Immunosenescence and impacts on immunohealth*
- *Dinacharya* and *Ritucharya* and immunohealth
- Essential Interdisciplinary, Crossdisciplinary and Transdisciplinary approaches for studying and describing immune health in viral diseases
- Foundational and driving vision for the future
- AYUSH modalities for activating the immune system.
 - Immunohealth for the poor

Presentation attached –Appendix

5. Dr. N. N. Mehrotra, *Former DD, CDRI, Lucknow; Former Regional Secretary, IASTAM*

Inter-disciplinary Research Activities for Management of Viral Infections with special reference to Covid 19

Management of viral diseases has always been a challenge due to various reasons, starting from complex pathophysiology of such infections to fast and recurrent somatic mutation of the infective agent. Since the age-old epidemics of Small pox to the current Covid 19, viral diseases have always played havoc with human health in epidemic proportions. Though small pox and polio have been eradicated, diseases caused by Coronaviruses and other viruses continue to be a cause of concern for medical fraternity. We are also aware of the long periods of sustained Global efforts of several years, involving billions of Dollars for global eradication of the above two viral infections.

Modern Biomedicine does not yet have any proven therapeutic or preventive regimen for the management of Covid 19, despite the high hope from a large number of vaccine candidates. However, there is adequate empirical evidence in support of the preventive immunomodulatory as well as therapeutic regimen & Measures of AYUSH Systems for Management of Covid patients. Ongoing population based, epidemiological, observational & Clinical studies & Interventions being undertaken by Union & State AYUSH Departments in various States & UTs with *Ashwagandha, Guduchi, Pippali, Shunthi, Kali Mirch, Mulethi, Kalmegh, Ayush64 etc.* & Yogic practices as Add-on as well as Standalone therapies have shown remarkable results in the management of Covid 19.

Thus, management of Covid 19 offers a remarkable opportunity for inter-disciplinary translational research activities. Following issues need to be addressed to and resolved for developing an integrated management of Covid 19, just as several other viral diseases.

- While the western Biomedicine is based on anti-viral therapeutic regimen, the Ayurveda & Yoga start the management of virus from the entry stage through physical barriers, besides masks (*Nasya* of *Anu* or other oils), breathing exercises (*Pranayam*), gargling, oil pulling and steam inhalation.
- An important aspect of management, of course, is with boosting immunity through the range of regimen suggested by Department of AYUSH in its guidelines and protocols. It is important to note that several of these immune boosting herbal preparations also have anti-pyretic and anti-inflammatory properties, besides being vaso-dilators and anti-tussive. Some of these drugs are also mild purgatives while some boost appetite by working at GI tract.
- Thus, the most important aspect of management with these therapies is their Holistic approach whereby they do not look only for anti-viral property to eliminate the 'causative agent' but also manage the body as a whole and the various clinical conditions as these emerge.
- Integration should ensure that the Scientific Principles and Framework of different Systems of Medicine should not be dominated by any given paradigm only. Though mutually agreed clinical parameters have to be uniformly followed, the approach to management of the health condition has to be according to each system of Health Care.
- One of the most challenging aspects is to develop protocols for trials where the basic foundational principles of systems viz. consideration of *Prakriti* in the selection of patients and their evaluation etc. are very critical.
- The issues pertaining to drug-drug interaction and drug-diet interaction & relationship to their impact on Health & wellness are also issues of concern.

These issues have to be addressed to develop integrative protocols for management of Covid or other viral conditions also through Community based as well as Clinical research.

6. **Dr. Mrs. Kavita Vinayak Indapurkar**, Professor & Head Kriya Sharir Vidnyan, Bharati Vidyapeeth Deemed University, College of Ayurveda, Pune India.

Ayurvedic concept of immunity—Vyadhikshamatva and its importance in viral diseases

Vyaadhikshamatva is the resistance (Khsamatva) against disease (Vyadhi). It implies both prevention Vyaadhikshamatva is the resistance (Khsamatva) against disease (Vyadhi).

It implies both prevention of diseases and rapid recovery from any particular disease (व्याधिक्षमत्वं व्याधिबलविरोधित्वं [४] व्याध्युत्पादप्रतिबन्धकत्वमिति यावत् तदेवापश्यतुल्यदोषतादि वितृणोति- तदे वेत्यादि| अत्र यद्यपि प्रस्तुतत्वादपश्यप्रतिबन्धकानि.....chsu 28/7)

Ayurveda states that Ashtanindit are Avyadhikhsama and are prone to wide variety of diseases शरीराणि चातिस्थूलान्यतिकृशान्यनिविष्टमांसशोणितास्थीनि दुर्बलान्यसात्म्याहारोपचितान्यल्पाहाराण्यल्पसत्वानि च भवन्त्यव्याधिसहानि, विपरीतानि पुनर्व्याधिसहानिच.सू. २८/७

A synonym for Vyaadhikshamatva which appears in the ancient texts is Bala. There are three types of immunity (vyaadhikshamatva or bala) in Ayurveda:

1. Sahaja: Congenital or Natural
2. Kalaja: Time, Season, Age
3. Yuktikruta: Acquired

तमुवाच भगवानात्रेयः- देहधातुप्रत्यनीकभूतानि द्रव्याणि देहधातुभिर्विरोधमापद्यन्ते; परस्परगुणविरुद्धानि कानिचित्, कानिचित् संयोगात्, संस्कारादपराणि, देशकालमात्रादिभिश्चापराणि, तथा स्वभावादपराणि||८१||

चरकसंहिता||श्रीचक्रपाणिदत्तविरचितया आयुर्वेददीपिकाव्याख्यया संहिता||सूत्रस्थानम् – २६./८१

Vyadhi –diseases can be *Nija* (due to internal causes) or *Agantu* (due to external causes). Body tries to remove non self-material according to Ayurveda it is called as *Vyadhiutpad-pratibandhakatwa*

तमुवाच भगवानात्रेयः- देहधातुप्रत्यनीकभूतानि द्रव्याणि देहधातुभिर्विरोधमापद्यन्ते; परस्परगुणविरुद्धानि कानिचित्, कानिचित् संयोगात्, संस्कारादपराणि, देशकालमात्रादिभिश्चापराणि, तथा स्वभावादपराणि||८१||

चरकसंहिता||श्रीचक्रपाणिदत्तविरचितया आयुर्वेददीपिकाव्याख्यया संहिता||सूत्रस्थानम् – २६./८१

Oja is the purest, finest essence formed from all seven *Dhatus*. Our physical, mental and spiritual strength totally depends on oja

तत्र रसादीनां शुक्रान्तानां धातूनां यत् परं तेजस्तत् खल्वोजस्तदेव बलमित्युच्यते, स्वशास्त्रसिद्धान्तात् । सु. सू.१५/१९

Vyaadhikshamatva depends on *Dhatu Sarata*, condition of *Srotas*, *Agni bala* and *Oja*. So according to Ayurveda One must maintain *Vyaadhikshamatva* to fight against viral diseases.

7. **Dr. Mrs. Madhuri P. Bhide**, Prof. & H.O.D.; Ayurved Samhita and Siddhanta Department, B.V.D.U. Pune

Comprehending Viral Diseases with Sushrut's Insights

The understanding new viral infections like Swine flu or covid 19 are stated as “*Anukta Vyadhi*” in Ayurved. Ayurved considers all the diseases as the end product of intermixing of the *Vikrut Dosh* and *Vikrut Dhatu*.

सर्वेषां च व्याधीनां वातपित्तश्लेष्माण एव मूलं; तल्लिङ्गत्वाद्दृष्टफलत्वादागमाच्च | SuSu 24/8

What biomedicine is labelling as “viral” can be the outcome of amplified abnormal Doshas, vata, Pitta and Kapha. It is clearly seen in this Pandemic of Covid 19 that many of the patients who had suffered from common cold and fever due to the seasonal changes or the *doshavruddhi* but all had not faced respiratory arrest. A very few of them that is only ten percent have been faced morbid situation.

कुष्ठिनां विषजुष्टानां शोषिणां मधुमेहिनाम् | कृच्छ्रेण सिध्यन्ति ||७|| Su22/6

Aged people, Diabetic patients, Asthama patients are considered in illumination of the fear of being morbid. Sushrut has wisely stated these patients as *Asadhya*.

These patients have *Shithil* (flaccid) Dhatu and have *dushtadosha* embedded in them hence suddenly get transformed into complications.

वयःस्थानां दृढानां स्थिरबहुमांसत्वाच्च सुखसाधनीयतमाः Susu 22/6

Diet and ideal lifestyle play a vital role in the intense (*Drudha*) and healthy upbringing of the body tissues. The intense body tissues seldom suffer any inflammations and suppurations.

अजीर्णात् पवनादीनां विभ्रमो बलवान् भवेत् |

ततः शोफरुजास्रावदाहपाकानवाप्नुयात् ||२२|| Susu 19/21

“*Ajirna*” i.e., indigestion leads in sudden increment of inflammation and suppuration due to ascending graph of anomalous *doshas*. Sushrut has pathetically warned a doctor to avoid the indigestion of the patients as it may direct towards pain, elevated secretions and uncontrolled inflammation.

Thus, a mere viral infection can make a terror campaign and mortal if Sushrut's wisdom is not tagged.

8. **Dr. Prasad Dilip Pandkar**, Associate Professor in Ayurveda Physiology (BVDU, CoA Pune) & Ayurveda Clinician

The Black box of Host-Pathogen Interactions and Ayurvedic Eye

The germ can stay in states of symbiosis, colonization, commensalism or latency and may damage, benefit or make indifference to host. ‘Germ theory’ received more importance and led to development of Medical Microbiology and Anti-Microbial medicines in last century. Although there was revolution in management of infectious diseases, many questions about outcomes of infectious disease remained unanswered. ‘Virulence factor theory’ (pathogenicity of microbe) tried to put light on it with study of toxins and surface proteins. Next remarkable development was ‘Damage response framework’ which facilitated incorporation of range of host responses to microbes with a parabolic curve in which host damage is plotted as a function of the host response. Interestingly neither host nor microbial properties are adequate to predict the outcome of host-microbe interaction because this outcome exhibits emergent properties.

In ayurvedic epistemology fever and wound are important chapters to incorporate external causations. Microbe is perceived as *nimittakarana* (instrumental cause), contact of microbe with receptors as *asamavayeeekarana* (non-intimate cause) and the host internal milieu as *samavayeeekarana* (intimate cause). In ayurvedic considerations *Agantu* (exogenous) diseases ultimately convert in *Nija* (systemic) disease only and thus outcomes depend on status of *Dosha*, *Dhatu*, *Mala* and *Agni* the elements of internal milieu. *Vikrutivighatakara bhava* (Disease resisting factors) is again important consideration in understanding the clinical outcomes. Disease presentation is a dynamic phenomenon and Charaka mentions *Bala* (Body-Mind strength and Immunity), *Agni* (metabolic capacity) and *Pradnya* (mental ability) as markers for prognosis. Interestingly Regulation of Immune homeostasis is again dependent on multiple factors including brain, gut, mind and metabolism. Ayurveda with its host centric approach can offer better model for understanding Immune dysregulation and fate of infectious diseases.

9. **Prof. Asmita Wele**; Head, Dept. of RSBKV [Ayurveda Pharmacology], BVDU College of Ayurved, Pune, Honorary Professor, Medical School, University of Debrecen, Hungary

Proposed AYUSH Solutions for COVID -19/SARS COV-2 Role of Rasushadhies in COVID -19

COVID -19 should be studied in both the directions: Antiviral approach and Classical Ayurvedic approach. Also, Laboratory studies and Clinical trials both should be conducted.

I propose the following points of intervention from translational perspective.

1. Target - Entry point. Objective: prevention – role of innate immunity: Herbomineral rasayanas, nutraceuticals, concept of healthy practices /lifestyle.

2. Target - The fusion process of virus and human nasal parenchyma. – Objective: destroying protein coat/ lipid membrane of the virus: Tribhuvan kirti, Suksmatriphala, Mallasindura/ Rasasindura /NavpashanKattu and some more mercurial/arsenicals
3. Target - ACE2 receptor. Objective: block entry into further cells. *Abhrakabhsmashatputi+ Mritasanjeevani sura / Vasarishta,*
4. Target –Receptors. Objective: Inhibit the release of IL6 and IL 6 R...etc cytokine storm. *Shrigarabhra rasa / Swarnabhasma + Guduchisatva / quath, Madhav Rasayan*
5. Target- affected organs. Objective: to maintain vascular integrity and conserve alveolar space. *Jaymangala rasa/Loknathpottali + Mritasanjeevani/ Drakshasava*
6. Target – Pyrexia/septicaemia/organ failure. Objective: arrest deterioration/ bring in revival / resuscitation. *Mrigashringa / Pravalpanchamrita + Vasaguduchyadiquath*
7. Target- secondary prophylaxis. Objective – non recurrence *Swarnamakshik / Arogyavardhini / Suvarnavasant + Punarnavashtaka / Gudhuchyadiquath, Chyavanprash, Samsarjan krama,* Dietary protocol, Yoga protocol

For each of the above mentioned step, in a clinical trial, standard comparator drug/standard of care and available biomarkers in host should be tested to make the data full proof. In laboratory studies, known models and markers of efficacy must be studied.

10. **Dr. Mrs. Kirti Bhati**, Associate Professor, Dept of Swasthavritta, BVDU, College of Ayurved, Pune

‘Ayurveda and Viral Diseases: Insight as Janapadodhwansha’

Ancient *Ayurveda* texts have used different terms like *Janapadodhwansha*, *Marakaand Janamar*. A detailed chapter on *Janapadodhwans* in *Charak Samhita Vimansthan* 3rd Adhyay explains epidemic.

Contamination of *Vayu* (air), *Jala* (water), *Desha* (place or soil) and changes in *Kala* (season) are accounted to be responsible for the diseases leading to *Janapadodhwansha*, the root cause of *Janapaodhwansha* is *Adharma* which in this context means non-performance of one’s duties with honesty or as per rules of the nature or country. *Adharma* arises due to *Pragyaparadha* (intellectual errors occurring knowingly)

It can be understood in present context that wrong deeds performed by human beings from generation to generation like polluting air, water and soil may be the cause of spread of air, water or soil pollution related diseases and also for diseases caused by extreme weather changes due to global warming.

Primary Preventive Measures are:

1. *Ashta-vidha Ahar-visheshayatana*
2. *Naimittika Rasyana* and age specific *Rasayana*

Secondary Preventive Measures are:

1. *Nidan Parivarjana*

2. Different types of therapies like *Santarpana* and *Apatarpana*
3. Avoiding different modes of transmission of *Aupasargikaroga*

Sadvritta Plays important role in keeping oneself healthy and in prevention of disease. *Sadvrittis* are applicable to people of all age groups, at all times and at all places.

Types of Sadvritta: These codes of conduct are classified in to following groups.

1. *Vyavaharikasadvritta* (Ethical codes of conduct).
2. *Samajikasadvritta* (Social codes of conduct).
3. *Manasikasadvritta* (Mental codes of conduct).
4. *Dharmikasadvritta* (Moral codes of conduct).
5. *SharirikaSadvritta* (Physical codes of conduct).

11. Dr. Neeta Mahesh Deshpande, H.O.D., Reader, R.I.A.R.C.H. Mayani, Maharashtra

Today, whole world is facing pandemic and its crisis of COVID19 that is a viral infection. Various viral diseases have been evolved in the time series. So, focus on viral diseases is prime need of time. Ayurved, the ancient medical science faced such situations many a times and references are found in classical texts. *Acharya Sushrut* in his *NidanSthan 5th Adhyay*, mentions about *AUPASARGIK ROGA* i.e., contagious diseases like *Jwara, Kushtha, Shosha, Raktabhishyanda*. Here we get crystal clear idea about contagious diseases which can be caused by certain organisms. *Acharya Charak* in *Janapadodwansaniya Viman Adhyay*, clearly mentions crisis of contaminated Desha, Jala, Kaal, etc. showing cause as organisms. Here virus may would have been one of the causes of all such crisis.

Ayurved has a great weapon of medicinal plant potential to combat such situations. Various medicinal plants have been found antiviral action like *Azadirachta indica, Allium sativum, Capparis spinosa*, etc. In the light of today research in medicinal plants, here is an effort to find solutions to fight against various viral diseases. Author has tried to find plants may be useful in various viral diseases. This will be useful in rational use of medicinal plants in such conditions. Also, it is need of time to focus what efforts have been done regarding research on medicinal plants in various viral infections. So that the initiative can be taken for further research in this regard.

12. Dr. Alpana S. Moghe, Head, Dept. of Cell & Molecular Biology, Rajiv Gandhi Institute of IT And Biotechnology, Bharati Vidyapeeth Deemed to be University, Pune

- 1) Experience of practitioners with specific ayurvedic medicines or formulations in treatment of viral infections
- 2) Scientific investigations on ayurvedic medicines for assessment of viral growth, replication, infection, virus host interactions.

- 3) Treatment or alternative strategies to keep immunity at adequate level to prevent from emerging new virus infections
- 4) Role of ayurvedic medicines/treatments in Covid 19 infections.

13. Dr. Mandar Akkalkotkar, *Physician and independent environmental professional @ Ayurved Science Forum & ACTmed*

Availability of RM raw materials for making traditional AUS (Ayurveda, Unani, Siddha) medicines needs to be discussed seriously. Trade and tradition totally depend on this supply. Botanicals are harvested mainly from wild.

Forest flora is depleted beyond control.

This needs to be corrected by planting large number of top twenty-five medicinal cultivable trees and shrubs harvested destructively HD for bark, roots, gums and heartwood BRGH.

They are required in 000' metric tonnes per year. A few million matured trees need to be killed annually to remove BRGH. Forest Survey of India (FSI) and Botanical Survey of India (BSI) can comment on the availability of these species.

Same time uninterrupted Supply of quality *Guggul*, *Shilajit*, *Vanshalochan*, *GoroChan*, Mercury, metals, non-metals and their processed products like *bhasma* etc can only allow the system to function effectively.

Identity, availability, safety, quality and efficacy needs to be addressed using modern pharma philosophy.

A mission mode approach is needed for raw materials, standardized economic processing and clinical use.

Quality planting materials QPM, seeds, seedlings, support for making model plantations, research for package of practices PoP will help to improve the situation.

National chemical (NCL) and botanical research institutes (NBRI) etc can help to rationalise the supply system.

Forest (ICFRE) and agricultural research (ICAR) institutes can play major roles in finding plus trees, mother plants, creating gene banks etc

Forest nurseries can provide very large number of seedlings to be planted in annual plantation programmes.

Question is, who will take first step?

14. **Dr. Sharayu Avinash Kore**, *Professor and HOD, Department of Dravyaguna, Sumatibhai Shah Ayurveda Mahavidhyalaya, Hadapsar, Pune*

Treatment of infective Viral hepatitis: Where biomedicine has no answers, Ayurveda has!!

- Ayurvedic principles of treatment of Kamala is perfect to combat viral hepatitis
- the recovery is much more faster. The statement “ There are no curative treatment for Viral hepatitis is not applicable to Ayurveda.
- each and every herb in Vasadi Kashaya has potential to combat viral diseases. mode of action should be explained as pachan virechan shaman and not as antiviral property of drug.
- Dange *et al.*, studied the efficacy of an Ayurvedic medication called *Arogyavardhini*, on rats that had CCl4 induced hepatic damage. 1987. Subsequently double blind clinical trial was completed.
- Arogya Vardhini and other herbal drugs for hepatitis B. Vasadi Kashaya twice in ananna kaal and evening , Arogya vardhini with Vasadi kashaya and Navayas loha and praval panchamrita Rasa in shaman kaal twice can be considered as vyadhi pratyanik medicines irrespective of Prakriti and other factors however the dose of virechak drugs in vasadi kashaya especially Haritaki should be so adjusted to make virechan karma which enable to alleviate excessive pittadosha.
- Where virechan is not established with above drug, then ichaabhedhi Mahamrutyunjaya, kampilak amalaki combinations are used till patient passes atleast 2 to 3 loose stool episodes.
- Australian antigen B positive patients turn to negative in around 40 to 60 days with above mentioned treatment which was better than positive control group.

References:

Treatment of infective hepatitis: Where biomedicine has no answers, Ayurveda has!!, B.J. Medical research Society project 1987, *Anc Sci Life*. 2016 Jan-Mar; 35(3): 176–179., doi: 10.4103/0257-7941.179861, PMID: 27143803

15. **Dr Pranita Joshi Deshmukh**, *Research Coordinator, Maharashtra Arogya Mandal's Autonomous R & D Institute, Program for Advanced Research in Ayurveda Sciences (PARAS), Associate Professor Dept of Kriya Sharir HOD, Dept of Research Methodology and Bio-statistics*

Anti-Viral Drug Delivery: A Key component of Dinacharya

In the wake of the Covid 19 outbreak, entire mankind across the globe is suffering. Enhancing the body's natural defence system (immunity) plays an important role in maintaining optimum health.

We need to identify day to day practices which will protect us from current and future virus on both prophylactic and therapeutic view. Ayurveda's extensive range on preventive care, derives

from the concepts of “*Dinacharya*” - daily regimes and “*Ritucharya*” seasonal regimes to maintain healthy life by uplifting and maintaining *Dosha* status.

Dinacharya's important component “*Pratimarsha Nasya*” is prophylactic as well as therapeutic regime for the nose, throat, sinuses and head. The face, shoulders and chest are massaged with herbal oils along with local hot fomentation then an exact dose of herbal extracts/oil is gently poured into the nostrils. The medicine is administered through nose either in the form of ghee, oil, powder, liquid or smoke. This form of drug preparation is proven effective in respiratory ailments.

Medicines used for nasal administration reaches to brain via nasal route and acts on higher centres of brain controlling different neurological, endocrinal and circulatory functions and thus showing local as well as systemic effects.

Viruses affect the nasal epithelial cells, damage tight junctions, disrupt membranes, and induce cell death. The epithelial infection process begins with viral entry into the nasal cell via receptors.

This administration of drugs through nasal route opens a new hope for the both local and systemic drug administration. Nasal route drug administration is a promising alternative route of drug administration for local, systemic and respiratory system action as well as therapeutic plus prevention action against COVID initial phases.

16. Dr. Vinay Sachadev, M.D. Rasashashtra, Ayurved physician, Pune

1. Ayurveda Has accepted the concept of infections caused by parasites under the heading of Agantuj vyadhi. This Agantuj Vyadhi later becomes Nija.
2. Viral infections or Jwar is caused due to the dushti of sharir and manas dosha.
3. Vitiation of sharir dosha depends upon various factors viz Vaya (Age), Kaal (Time of the day), Ritu (Season), Agni.
4. Dosha Vitiation Can be controlled by adapting various Ayurvedic Modalities like Langan, Pachan, Dinacharya, Rutucharya, Rasayan and so on.
5. Immunity is a broad-spectrum concept which can be compared with Bala, Agni, Dhatu, Prana, Rakta etc.
6. Role of mana also plays an important role in the manifestation of infection and its fate by Immunity.
7. In the lifecycle of Virus Host plays key important role, So Approaches can be made to make the Host strong.

Appendix

Presentation slides of Prof. Dr. Madan Thangavelu

Ayurveda & AYUSH-based Immunity: Fact or Fiction

Figure 1. The course of COVID-19 and General Approach to treatment

| Phase | 1 | 2 | 3 | 4 |
|-------------------------------|--|---|-------------------------|-----------------|
| Evolution | 1. Symptomatic | 2. Early Fulminant Phase | 3. Late Fulminant Phase | 4. Recovery |
| Immune Response | Immune response | Immune response | Immune response | Immune response |
| General Approach to treatment | Supportive care, high fluid intake, quarantine | IVI - MHC Inhibitors and T-cell APT & other s. 2019 | Progressive Supportive | |
| Preventive Approach | Supportive care | IVI - MHC Inhibitors and T-cell APT & other s. 2019 | Progressive Supportive | |
| Preventive Approach | Supportive care | IVI - MHC Inhibitors and T-cell APT & other s. 2019 | Progressive Supportive | |

... immunological misfiring in severe COVID-19

The 3 major types of innate and adaptive cell-mediated effector immunity

Fig 1
The 3 major types of innate and adaptive cell-mediated effector immunity. Type 1 immunity is composed of T-bet⁺ IFN- γ -producing CD4⁺ T_H1 cells and ILC1s and T-bet⁺Eomes⁺ CD8⁺ T_H1 and NK cells. Type 2 immunity is composed of GATA-3⁺CD4⁺ T_H2 cells, CD8⁺ T_H2 cells, and ILC2s, which produce IL-4, IL-5, and IL-13. Type 3 immunity is composed of ROR γ t⁺CD4⁺ T_H17 cells, CD8⁺ T_H17 cells, and ILC3s, producing IL-17, IL-22, or both. CLP, Common innate lymphoid precursor; CLP, common lymphoid precursor; LN, lymph node; LT, lymphoid tissue inducer; PP, Peyer patch; T_H, T-cell progenitor.

nature
Longitudinal analyses reveal immunological misfiring in severe COVID-19
Gemma Louise, Patrick Wang, J. J. Alex Anand
Nature 583(7819): 470-475, 2020
DOI: 10.1038/s41586-020-2001-4

Abstract
Recent studies have provided insights into the pathogenesis of coronavirus disease 2019 (COVID-19). Yet, longitudinal immunological correlates of disease outcomes remain unclear. Here, we serially analysed immune responses in 113 COVID-19 patients with moderate (type 1) and severe (type 2) disease. Immune profiling revealed an overall increase in disease cell immunity with a concomitant reduction in T-cell number. We identify an association between early, elevated cytokines and worse disease outcomes. Following an early increase in cytokines, COVID-19 patients with moderate disease displayed a progressive reduction in type 1 (antiviral) and type 3 (antifungal) responses. In contrast, patients with severe disease maintained these elevated responses throughout the course of disease. Moreover, severe disease was accompanied by an increase in multiple type 2 (anti-tumour) effectors including IL-5, IL-13, IgE and eosinophils. Unsupervised clustering analysis identified 4 immune signatures, representing (A) growth factors, (B) type 2/3 cytokines, (C) mixed type 1/2/3 cytokines, and (D) chemokines that correlated with three distinct disease trajectories of patients. The immune profile of patients who recovered with moderate disease was enriched in disease-regenerative growth factor signature (A), while the profile for those with worsened disease trajectory had elevated levels of all four signatures. Thus, we identified dysregulation of a multilayered immune response profile associated with severe COVID-19 outcomes and early immune signatures that correlate with divergent disease trajectories.

... immunological misfiring in severe COVID-19

Fig. 1: Overview of immunological features in patients with COVID-19.

From: Longitudinal analyses reveal immunological misfiring in severe COVID-19

Abstract
Recent studies have provided insights into the pathogenesis of coronavirus disease 2019 (COVID-19). Yet, longitudinal immunological correlates of disease outcomes remain unclear. Here, we serially analysed immune responses in 113 COVID-19 patients with moderate (type 1) and severe (type 2) disease. Immune profiling revealed an overall increase in disease cell immunity with a concomitant reduction in T-cell number. We identify an association between early, elevated cytokines and worse disease outcomes. Following an early increase in cytokines, COVID-19 patients with moderate disease displayed a progressive reduction in type 1 (antiviral) and type 3 (antifungal) responses. In contrast, patients with severe disease maintained these elevated responses throughout the course of disease. Moreover, severe disease was accompanied by an increase in multiple type 2 (anti-tumour) effectors including IL-5, IL-13, IgE and eosinophils. Unsupervised clustering analysis identified 4 immune signatures, representing (A) growth factors, (B) type 2/3 cytokines, (C) mixed type 1/2/3 cytokines, and (D) chemokines that correlated with three distinct disease trajectories of patients. The immune profile of patients who recovered with moderate disease was enriched in disease-regenerative growth factor signature (A), while the profile for those with worsened disease trajectory had elevated levels of all four signatures. Thus, we identified dysregulation of a multilayered immune response profile associated with severe COVID-19 outcomes and early immune signatures that correlate with divergent disease trajectories.

Pericyte-specific vascular expression of SARS-CoV-2 receptor ACE2 – implications for microvascular inflammation and hypercoagulopathy in COVID-19 patients

Abstract

Accumulating clinical observations suggest pathogenesis beyond viral pneumonia and its secondary consequences in COVID-19 patients. In particular, many patients develop profound hyperinflammation and hypercoagulopathy with disseminated thrombogenesis and thromboembolism, which we observe also in a Swedish COVID-19 intensive care patient cohort. To understand these vascular manifestations, it is important to establish the potential vascular entry point(s) of the SARS-CoV-2 virus, i.e. which vascular cell types express the SARS-CoV-2 receptor ACE2. We present data that ACE2 is specifically and highly expressed in microvascular pericytes, but absent from endothelial cells, perivascular macrophages and fibroblasts. Mice with pericyte ablation show increased expression and release of Von Willebrand Factor from microvascular endothelial cells, suggesting that pericytes orchestrate thrombotic responses in neighboring endothelial cells. Identifying pericytes rather than endothelial cells as the ACE2-expressing cells in the vasculature may explain why hypertension, diabetes and obesity are risk factors for severe COVID-19 patients, as these conditions are characterized by an impaired endothelial barrier function, allowing SARS-CoV-2 to reach and infect the pericytes that are normally shielded from the blood behind an intact endothelial barrier. This novel COVID-19 pericyte hypothesis is testable, offers explanations for some of the most enigmatic and lethal aspects of COVID-19 and calls for further investigations into the possible benefits of preventive anticoagulant therapy.

Reinvigorating Exhausted T Cells by Blockade of the PD-1 Pathway

Abstract

T-cell exhaustion due to persistent antigen stimulation is a key feature of chronic viral infections and cancer. Programmed cell death-1 (PD-1) is a major regulator of T-cell exhaustion, and blocking the PD-1 pathway restores T-cell function and improves pathogen control and tumor eradication. Immunotherapy targeting the PD-1 inhibitory receptor pathway has demonstrated significant antitumor activity. Recently, antibodies blocking PD-1 have been approved for use in cancer patients. In this review, we summarize the role of the PD-1 pathway in chronic infection and cancer and the therapeutic potential of PD-1-directed immunotherapy in patients with chronic infection or cancer.

Keywords: T-cell exhaustion; cancer; chronic infection; immunotherapy; programmed cell death-1.

<https://pubmed.ncbi.nlm.nih.gov/28286692/>

FIG. 1 PD-1 signaling.

PD-1 contains two tyrosine-based signaling motifs in the cytoplasmic domain: an immunoreceptor tyrosine-based inhibitory motif (ITIM) and an ITSM. Upon engagement by PD-L1 or PD-L2, PD-1 is phosphorylated at both tyrosine residues. Phosphorylated ITSM recruits SHP-1 and SHP-2 that dephosphorylate effector molecules such as ZAP70 and PI3K activated by TCR and CD28 signaling. As a result, PD-1 signaling inhibits T-cell proliferation, survival, cytokine production, protein synthesis, and glucose metabolism.

cnic Fundación Centro Nacional de Investigaciones Cardiovasculares Carlos III

Fundación proónica

Simón Méndez Ferrer

Hematopoietic stem cell traffic is regulated by circadian oscillations

Nature. 2010 Aug 12;466(7308): 829-34. doi: 10.1038/nature09262.

Mesenchymal and haematopoietic stem cells form a unique bone marrow niche.

<http://www.ncbi.nlm.nih.gov/pubmed/20703299>

<https://www.cnice.es/en/desarrollo/nicho/>

Figure 1: Peri-vascular nestin+ mesenchymal stem cells are innervated by sympathetic fibers in the bone marrow. Projection stack (~100 μm) of fluorescent images showing the distribution of Nestin-GFP+ cells (green), CD31/PECAM+ vascular endothelial cells (blue) and tyrosine hydroxylase+ sympathetic nerve fibers (red) after whole-mount staining of the skull bone marrow.

Figure 2: A bone marrow stem cell niche made for two. Projection stack (~15 μm) of fluorescent images showing a CD150+ (red) CD48-, CD3e-, Ter119-, Gr1-, B220- and CD11b- (antigens labeled in blue) hematopoietic stem cell adjacent to a nestin-GFP+ mesenchymal stem cell (green) in the bone marrow (from Nature 466: 829-34). Grid, 50 μm.



Searches for Global Best Practice

Defining and refining the much needed non-pharmacological interventions

Two recent and notable events,
of many such events globally

For defining and refining the Sciences
of:

- Health Promotion
- Health Maintenance
- Disease Prevention
- Cure

Can Medicine Be Cured? The Corruption of a Profession



Emergent Physiology Beyond Genomics:

Insights from India's Traditional Sciences



Medical University of Graz, Austria



<http://www.euroayurveda.eu>



French National Institute of Health and Medical Research

Physiologie de la Nutrition & Toxicologie,
INSERM UMR 1231,
Université de Bourgogne-Franche Comté (UBFC),
Dijon, France



Sydney Brenner

Born: 13 January 1927, South Africa
Died: 5 April 2019, Singapore.

Prize motivation:

"for their discoveries concerning genetic regulation of organ development and programmed cell death"

How does the egg form the organism?

AND DOCTORS Teaching Biologists Another Language!

The last line of the last paragraph from Sydney's autobiography is fascinating:

http://www.nobelprize.org/nobel_prizes/medicine/laureates/2002/brenner-02a.html

I am still, at the age of 76, excited by scientific research and the prospect of what can be done in biology. Science is something one is tied to for life and one should never retire from anything until one has secured one's next job.

The endless quest for knowledge will continue as long as humans exist.

I copy below, from the Editorial:



*"In one way, you could say all the genetic and molecular biological work of the last 60 years could be considered a long interlude... We have come full circle—back to the problems left behind unsolved. How does a wounded organism regenerate exactly the same structure it had before? How does the egg form the organism? **In the next 25 years, we are going to have to teach biologists another language...I don't know what it's called yet; nobody knows...**" (Sydney Brenner)*

Ayurveda is one exemplary introduction to and what is required for Teaching Biologists Another Language!

PM Modi inaugurates Silver Jubilee celebrations of RGUHS

<https://www.youtube.com/watch?v=Na29tCizpBQ>



"25 years mean Rajiv Gandhi University of Health Sciences is in the prime of its youth. This is the age to think even bigger and do even better. I am confident that the University will continue to scale new heights of excellence in the times to come."



N=1 to N=0 or ... From Structures to just Processes

Processes: infra < sub < hypo < ultra < super < hyper

*N=0 ... the ideal state that Ayurveda wishes all of us to be in ...
when there are no more entities but just a collection of 'hyperprocesses'
and relationships in the hyperprocesses being mediate by three processes:*

- **vata*, *pitta* and *kapha**
- *and respecting the eternal rule of three *gunas*!!*

And the Human Body is but a 'Metaorganism' –
made up of a collection of cells (ours and the associated microbes) and
cells (mitochondria) within cells.