## APPENDICES

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INFORMED CONSENT FORM

Title: STUDY ON BHAISHAJYA MAHA YAJNA USING ELECROPHOTONIC IMAGING AND ENVIRO-TECH

INFORMATION TO THE PARTICIPANTS:

This study, is being conducted as a part of Ph.D. Program in Swami Vivekananda Yoga Anusandhana Samsthan University (SVYASA University), trying to observe the changes during ancient traditional practices like Homa in the human energy field which will be measured on EGD/EPI.

Your consent is sought to take part in this study. If you consent to take part in this study, the investigator will ask you to undergo GDV/EPI test. The test may take approximately two minutes for one assessment. It is expected not to cause any serious adverse effect on your physical or mental health. During the entire period of the study you, Sri/Smt ___________________ can continue to do your day-to-day activities.

Please note that you have a right to refuse to take part in the study at any time. Your refusal will not adversely affect your health. Please also note that the information you are going to divulge, to us and the content of any information about you will be kept in utmost confidentiality.

Undertaking by the investigator:

Your consent to participate in the above study is sought. You have a right to refuse consent or withdraw the same during any part of the study without giving any reason. I undertake to maintain complete confidentiality regarding the information obtained from you during the course of the study. If you have any doubts about the study, please feel free to clarify the same. Even during the study you are free to contact the investigator for clarifications if you so desire. The phone number of the investigator is given below:
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Consent:

I have been informed about the procedures of the study. The possible risks too have been explained to me as stated in the information. I have understood that I have the right to refuse my consent or withdraw it any time during the study without adversely affecting my health. I am aware that by subjecting to this investigation, I will have to give more time to assessments by the investigating team and that these assessments do not interfere with my health.

I, ________________________________, the undersigned, give my consent to be a participant of this investigation/study program.

I, ________________________________, the undersigned, give my consent to for my interview to be audio-taped.

Signature of the Participant       Signature of the investigator
(Name)                            (Name and Designation)
Date:                              Place:
THREE ARTICLES FROM THIS RESEARCH WORK


The significance of fire offering in Hindu society
S. Sushrutha¹, H. R. Nagendra², R. G. Bhat³

Abstract

India is a land of social and cultural diversity. It is also rich in tradition encompassing an integrated approach of lifestyle that goes in tune with nature. Most of the ancient Hindu scriptures emphasise on appropriate action, work or duty (karma in Sanskrit language) following righteousness so that one can achieve spiritual salvation. Indian philosophies show the suitable path based on the nature of individual attitude and behaviour to fasten the process. The foremost among the ancient Hindu scriptures are the Vedas. They form the social, cultural, religious and scientific foundations for the Hindu way of life that generally promotes righteous actions to enhance humanity. The fire offering is called Yajna in Sanskrit. Even the worship of Nature itself is considered as an offering to God. Hindu scriptures state that natural energy centres in the cosmos have been understood as Devatas (Gods) and different methods of worshiping them are used. This article highlights the concept of Yajna, its significance and the offerings made for suitable purposes in Hinduism. Brief scientific outlook of these ritualistic offerings made for special purposes is also presented so as to bring out the importance of sacrificial practices in the modern context.

Key words: Yajna – Devatas - fire offering - Harmony between living beings

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Introduction

Vedas demonstrate three domains of living for betterment of process and they include \textit{karma} (action), \textit{dhyana} (meditation) and \textit{jnana} (knowledge). As long as individuality continues as human being, actions will follow and it will eventually lead to knowledge. According to the Dhatupatha the word \textit{yajna} derives from \textit{yaj} in Sanskrit language that broadly means, [a] worship of GODs (natural forces), [b] synchronisation between various domains of creation and [c] charity.\textsuperscript{1}

The concept of God differs from religion to religion. The ancient Hindu scriptures conceptualises \textit{Natural forces} as GOD or \textit{Devatas} (\textit{deva} that which enlightens [\textit{div} = light]). Commonly in all ancient civilizations the worship of Natural forces as GODs was prevalent. Therefore any form of manifested (Sun, fire and so on) and or unmanifested (\textit{Prana, Manas} and so on) form of energy is considered as GOD even in Hindu tradition.

Worship conceives the idea of requite to the sources of energy forms from where the energy is drawn for the use of all life forms. Worshiping the Gods (\textit{Upasana}) can be in the form of worship of manifest forms, prostration, collection of ingredients or devotees for worship, invocation, study and discourse and meditation.

Sacrifice is also a ritualistic mode of connecting between various domains of creation and their respective deities through the eternal messenger AGNI (fire) (\textit{Sangatikaranam}); the degree of freedom to think and act rests with the individual especially with human beings depending on how one connects to these realms spiritually through the mode of \textit{Yajna}. That is considered as \textit{Loka} where the \textit{Karmaphala} (result of action either merit or demerit) is being materialised. One enjoys \textit{Svargaloka} (heaven) on account of \textit{Punya}, suffers in \textit{Narakaloka} (hell) on account of
Papa, and takes birth as human to pile up the *Karmaphala* up for the next cycle. Thus, a new cycle of birth and death continues for ever without an end until one realizes about false eternity of deplorable repetition. In this regard, ritualistic sacrifice plays a major role by which beings in this world please the GODs for fulfilment of cherished desires. *Raghuvaṃsha* of Kalidasa, specifically gives the reference as to how the various realms were sustained just as King *Dilipa*, a great king who “performed great sacrifices by utilising the treasures of earth to please the GODs and they drained the heavenly treasures in the form of rains. Thus by a mutual exchange between beings of various realms harmoniously, the sustenance of these worlds by sacrifice was ensured”. [Bhagavad Gita 3.11 – 12] also upholds the similar view in mutual exchange for sustenance.

“Cherish the *Devas* with *Yajna* and may the *Devas* cherish you, thus cherishing one another you shall gain the intended wealth and maintain the cosmic harmony factually natural forces are purified and energised by this system of Yajna.”

**Apposite Charity (Daanam):** every living being is a custodian of limited resources of vast Cosmos for a while to experience the results of action done in the previous birth. Depending upon the quantity of merits and demerits longevity and quality of life will be decided to spend some time here on earth. In this span of time one has to look after the family, society and other living beings by default because of the support that one gets to sustain. As an obligatory action one should take care of others by sharing and caring. This is also *Yajna*.

**Sacrificial fire**

Fire is regarded as the primordial divine element that aids creation, sustenance and destruction of the universe. Fire was regarded as a messenger of GODs and was summoned in all sacrifices to carry special offerings to them. Several customs were associated with sacrifices such as the ignition (*Janana*-birth), protection and extinguishing the fires. Since Vedic times several
sacrifices like those involving consecrating cooked items (*Paka-Yajnas*), involving usage of Soma (an extraction of a chosen creeper known as *Somayajnas*) and those involving the offering of oblations (*Havir-Yajnas*) collectively known as *Shrauta-Yajnas* (*Yajnas* originated directly from Vedas) have been performed. These gradually declined in course of time giving rise to *Smarta-Yajnas* (*Yajnas* prescribed in *Smritis*) which are performed during several ceremonies associated with an individual from one’s birth to death.

Fire was believed to be a living person invoked in sacrifices and it was customary to perform sixteen rites (*Samskaras*) such as conception (*Garbhodhana*), birth (*Jatakarma*), first feeding (*Annaprashana*) and so on. These rights have been elaborately dealt in several ancient texts beginning from the Vedas, *Shrauta Sutras*, *Agama* texts, and post Vedic texts especially dealing on sacrifices.²

Apart from these Hindu scriptures highlight the significance of 5 great *Yajnas* that have to be performed by every householder. Taittiriya Aranyakā³ mentions these as (i) *Deva Yajna* (*offerings to GODs*): worship of GODs in different ways which are suitable for one’s level (ii) *Pitr Yajna* (*Offerings to forefathers*): reverential bonding with parents, respecting and adoring the forefathers who were the cause for one’s existence, by practicing the family tradition etc. One’s welfare depends upon welfare of many members in the family. So this kind of *Yajna* tries to please all the family members in past. (iii) *Bhuta Yajna* (*offerings to animals, birds and so on*): compassion towards the nature, animals, birds and any creature in the world. To look after the living beings is *Bhuta Yajna*. Almost all the deities have vehicles in the form of animals. While worshiping the particular deity, invariably their vehicles are also worshipped. This way revering animals taking care of all the animals is *Bhuta Yajna*. (iv) *Manushya Yajna* (*offerings to humanity*): it is an expansion of emotions to encompass the entire humanity as a family.
“Consideration of mine and thine weigh only with those little minded; to the large-hearted, on the other hand, the whole world is like a single household” – is the standpoint of the narrow-minded, for the magnanimous-hearts however, the entire earth is but a family.\(^4\) Stretching helping hands in need is real \textit{Manushya Yajna}. (v) \textit{Bhrahma Yajna (offerings in the form of wisdom)}: showing the reverence to the scriptures by studying under the real master who is traditionally oriented.

Various Hindu Traditions also speak of several other \textit{Yajnas} as enunciated in the Bhagavad Gita as follows: (i) \textit{Dravya Yajna}: offering selected and sacred plants into the fire chanting specified Mantras related to particular Gods and Goddesses for welfare of one. This includes sharing one’s belonging with others and charity to needy and eligible. (ii) \textit{Tapo Yajna}: following strict conduct in order to purify and master oneself by the process of varieties of practices, such as, sacrificing physical comforts, sitting for longer duration at one place, breath control, reducing sensory pleasures, study of scripture into deeper levels, contentment with limited and minimal resources and so on. It may vary from mild to very severe levels also. People depending upon intensity to reach the intended goal follow the same. Tapa is followed in three levels - emotional, vocal and physical. Being calm, happy, voluntary control over speech, pure emotions – tapas at emotional level; non-provoking words, speaking truth, study of the scriptures – tapas at vocal level; finally - respecting elders, cleanliness, and non-violence – Tapas at physical level. (iii) \textit{Yoga Yajna}: constant practice of methods to control the \textit{Manas} (Mind) through vigour practice in the path of Yoga lay down by Patanjali and other Gurus. Nature of mind is to wander, to have control over mind through multifarious activities. \textit{Patanjali Yoga Sastra} states that total mastery over mind through practice and mastery over desires is Yoga. (iv) \textit{Svadhyaya Yajna}: study of scriptures that really can make one to reach \textit{Moksha} (complete liberation) or repetition of selected and initiated \textit{Mantra} for longer duration, until one gets total mastery over on the same, especially \textit{OM-kara}. OM based \textit{Dhyanas} (meditations) are many in number, explained in almost all the
major literature of India. Self-analysis also considered as Svadhyaya in this context which actually show that what is the rate of inner growth in life. (v) Jnana Yajna: to seek true knowledge through strict austerity. The only goal in one’s life in this path is self-realisation by every means.⁵

The classification and description of Yajnas as outlined above significantly highlights the purpose of performing any Yajna. In the modern context there are certain sections of the society who oppose the performance of Yajnas on similar lines as those of the Charvaka (atheist) philosophers of ancient Indian traditions. The Charavakas outrightly rejected the attainment of heaven obtained by sacrifice of an animal (Pashu) in Yajna supporting the view that in that case one could offer ones’ own father so that he may attain heaven.⁶

**Performance of sacrificial rituals**

From Vedic times fire was ignited by rubbing sacrificial twigs (called Arani) together. The churning of fire involves the use of both palms and the ten fingers that are considered to be the sisters of fire. From this rubbing there is symbolic act of conception (Garbhadhana) of fire. Rgveda ¹RV (5.2.1-2) says the Arani which gives birth to Agni is called Yuvati (young mother) and Mahishi. This mother clasps her child to the bosom, does not give it to the father. Sometimes the text speaks that Agni has two mothers such as the lower Arani and upper vertical stick [RV 1.141.3]. RV [3.29.1-3] compares this kindling of fire by friction to procreation⁷. The ancient sages even prescribed all the rituals associated from birth to death (as for humans) to the sacrificial fire. These include the various rituals of Garbhadhana (Conception), Pumsavana (Rite of engendering a male child), Simantonnayana, (rite of parting the hair ceremoniously), Jatakarma (Birth), Namakarana (Naming), Annaprashana (First feeding), Caula (First cutting),
Appendices

Upanayana (Thread ceremony), Vrata (with gifts of cows given symbolically to preceptor), Samavartana (returning home after studies), Vivaha (marriage) with respective mantras for Agni.

The performance of sacrificial rituals also involves the worship of several deities seeking their grace to remove several obstacles, the symbolical union of the ladles – Sruk (being personification of Shakti) and Sruva (Personification of Purusha), expiatory ceremonies to ward off evils originating in the course of performance of Yajna.7

“Yajna is an offering to higher divine beings” from where humans and other living beings on earth are drawing energy for their existence. “Let the offering be more than what I receive” (Narasimhan, et al. 2011). Krishna, in the Bhagavad Gita, gave a clear idea about the mechanism of nourishment of both Humans and Gods. “All beings are evolved from food, the production of food is dependent on Rain, the Rain has its origin from Yajna and Yajna is rooted in rooted in prescribed action (Karma). Karma has its origin in the Vedas and the Vedas proceed from the indestructible (GOD), hence all-pervading infinite is always present in Yajna”. [Bhagavad Gita 3.14-15]. This is also upheld by the Mahabharata [Anushasanika Parva Vishnusahasranama. 971 – 980].

Harmonious way of living in the creation itself finally becomes Yajna. If the bestowed boon by gods is not returned back, one is considered as thief, returning nothing. Yajna is simply a way of expressing our deep sense of appreciation and gratitude to them for the parts that they play in this creation. This is the only way to retort GODs. The righteous one who eats the remnants of the sacrifice are freed from all sins; but those sinful ones who cook food only for their own sake, verily eat sin. [Bhagavad Gita - 3.16].

Individual’s attitude while performing Yajna
“The ladle with which an oblation is offered, the fire into which offering is given and the act of offering oblation is Brahma. Oblingation poured into fire called Iswara (the lord), by God, is regarded as sacrifice. One who performs such sacrifices is merged in Him and attains Him”. [Bhagavad Gita 4. 25-28] helping a Practitioner (Sadaka) to realize oneself spiritually. The man who does not offer, for him neither this world nor those beyond are happy [Bhagavad Gita - 4.31]. In order to comprehend reality different types of Yajnas are included facilitating every Sadhaka.

Man is bound by his own action except when it is performed for the sake of Yajna [Bhagavad Gita - 3.9]. One of the important properties of the offering is that one can be free from the bondage of getting tied up by doing. It is an ideal action which results in making one free from bondages. The idea behind the performance of Yajna is for social welfare and wellbeing of nature. The process of Yajna starts from the intention (Sankalpa). One intends to achieve some goal based on one’s desires and Yajna serves as the means to achieve the goal.

Offerings in Yajna

Beginning from Vedic times the sages ordain the offering of various items (Sambhara) in performance of Yajnas. Some of these include pure ghee of cow, various types of sacrificial twigs (Samits), grains, parched rice, rice recipes (Charu, Payasa and so on), honey, Darbha grass, herbal plants (Soma and several Ayurvedic formulations). These offerings were made at certain auspicious times of the year for specific purposes. Material offerings that were made were supposed to be of good quality collected at auspicious times and apt places for the sake of its fullest results according to the ancient scriptural prescriptions. Such prescriptions are found in several Shrauta text and appendices of four Vedas, and also in post Vedic texts and manuals dealing with sacrifices.
These performances were broadly divided into four categories such as *Nitya, Naimittika, Kamya* and *Prayashcitta*. *Nitya* performances are done twice a day in dawn and dusk (*Sandhyavandanam* and *Agnihotram*) which includes salutations to Sun and fire offering with minimal materials; *Naimittika* includes all festivals and occasional performances (*Darshapurna, Pradosha, Vratas* and so on) in accordance with seasonal changes; *Kamya* Karmas are performances to fulfil the desires such as (*Putrakameshthi – Yajna* done for begetting children; *Pashuyaga – Yajna* for increasing the animals; *Rajasuya – consecration of a king* and so on); *Prayashcitta* actions are nothing but expiatory to pacify the negative effects for unintended mistakes.  

Apart from these the main motive of a sacrifice is to shed one’s ego and offer whatever GOD has given to others without expecting any returns. Although several texts mention sacrifices involving slaughter of animals, there is a misinterpretation of the practices. What the texts actually prescribe is the sacrifice of the evil qualities within the individual self that resembles animals’ in behaviour (*Pashuttva*). This assumes significance in the view of offerings made blindly by the sacrifice without having prior knowledge of each action performed during *Yajna*. In modern contexts it is quite natural to observe the performance of several sacrificial rituals blindly and merely for the attainment of one’s desires. Such individuals differ no less than the Atheist (*Charvakas*) who maintain that when a sacrificial animal is bound to attain heaven why not sacrifice one’s own father so that he may also attain the same bliss! However Vedic and Post-Vedic texts also prescribe special offerings to fulfil certain desires that were made during auspicious and inauspicious periods. Auspicious offerings include those made during *Rajasuya, Ashwamedha, Darshapurnamasa* and so on. Inauspicious offerings include those made during drought conditions, portents, natural-calamities and so on for appeasing the deities governing those natural forces. As an example one may consider the *Karirshti Homa* prescribed in *Taittiriya*
Samhita wherein Karira [Capparis aphylla] fruits are offered in the sacrificial fire resulting in auspicious smoke that pervades the atmosphere and inducing rain so as to remove the inauspiciousness of drought.  

**Experimental observations of Yajna and effects**

As mentioned above the offerings that were made by the sacrificer in different occasions gave specific results at the appropriate times with the grace of divine interventions.

Research studies in India and abroad indicates the efficacy of several Yajnas that benefitted society with enhanced improvements in physiological and psychological well-being of individuals, Good agricultural outputs, Harmonious balance between man and nature and so on. As an example the Agnihotra Fire rituals are believed to bring about equilibrium of nature, holistic growth and enhancement of human life. Agnihotra basically involves offerings such as cow-dung cakes, cow’s ghee, sacrificial twigs such as Vata (Ficus Bengalensis), Audumbara (Ficus Glometra), Palasha (Butea Frondosa), Bale (Aegle Marmelos) and so on. Of these experimentally found that the offerings of ghee produces acetylene and sucks the pollutants in the air thus purifying it. Cow dung contains plenty of Menthol, Ammonia, Phenol, Formalin and so on, thus acting as disinfectant to eradicate pathogens in the atmosphere. The offerings of sacrificial twigs have medicinal and beneficial effects such as reduction of excessive heat in atmosphere. EEG tests of the sacrificers have been found to be showing increased Alpha waves indicating the brain being in complete relaxation. The Mantras chanted during the offering of oblations also charm them with energy that connects the sacrificer to the spiritual deities to whom the offerings are made. Similar effects of Agnihotra performance on plant growth, seed germination, curing of skin diseases, water purification have been investigated based on different experiments performed by scientists.
Similar experimental Observations of *Atiratrm Yajna, Somayajnas, Karirshti Homa* and others to bring about rain as well as to induce Moisture content (*Somamsha*) in the present Global Warming scenario have been reported from several places at which the Yagas were performed.\textsuperscript{15} *Somayaga* is a sacrificial ritual in which Soma juice oblations to the deities thus energising the five elements in the universe (Earth, Fire, Air, Water and Ether) in order to bestow prosperity and restore natural equilibrium. These Yajnas show enhanced monsoon rain fall that was timely and sufficient so as to bring about agricultural prosperity. The Natural cycle of six seasons is accelerated and regulated by the performance of *Somayagas*. In an average about 70\% accuracy of rainfall has been recorded in the places where *Somayagas* were performed.\textsuperscript{16}

**Conclusion**

Indian traditional practices such as *Yajna* and Yoga have their relevance even in the present scenario. Among all the performances Fire ceremony plays major role in refining the human thoughts and life process in accordance with the Nature. Eco-friendly method of leading life can answer the individual and social challenges to uplift Humanity with apt method. This can happen only by clear understanding of every action one performs. However fire ceremony helps human to understand the nature around and systematizes oneself in tune with nature. From the above discussion on offerings made, one needs to equip with this knowledge of the kind of offerings so that fire offering ceremony enhances the positive effects to bring about a traditional, harmonious, prosperous society for the future generations.

**Acknowledgement**
I would like to thank the chancellor and Vice-chancellor, Swami Vivekananda Yoga Anusandhana Samsthana, Bangalore, Prof G. Agoramoorthy, Tajen University, Taiwan and K.G. Sheshadri who supported in refining the article.

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Comparative study of Influence of Yajña and Yogāsana on stress level as Measured by Electron Photonic Imaging (EPI) Technique

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Abstract

Background: Vedic literature makes injunction of Yajña extensively as one of the Karmas to achieve the intended goal by performing a set of activities, maintaining synchrony with creation. Various Yajñas have been explained for removal of diseases. Electro Photonic Imaging (EPI) technique, a specially designed instrument is used to measure human stress level based on the autonomic nervous system activity. The present study is designed to explore the influence of Yajña on normal healthy individuals’ stress level.

Aim: To compare the influence of Yajña and Yogāsana sessions on stress level using Activation coefficient as measured by EPI.

Settings and Design: In a self as active control study, 18 participants underwent one hour yoga session on the first day and Yajña session on the next day. Data were taken before and after the session of the respective event. The subjects of study were participants of YIC (Yoga Instructor Course) from different places in India who have recently gone through one month of Yoga Instructor Course at Prasānti Kuṭṭam.

Methods and Material: In the study participants had one hour Yoga session and on the next day, they took part in Saraswati Yajña for one hour and ten minutes. On each day, EPI data were taken before and after the session of each event. These are the two interventions in the study.

Statistical analysis used: SPSS-12.00 software was used for data analysis. Paired sample t-test was used for analysis.

Results: Within group differences showed significant change observed in Activation coefficient (p<.021) of EPI parameter in Yajña session indicating decreased stress level after Yajña session.

Conclusions: Yajña brings about a larger decrease in stress level compared to Yogāsana session. The effects of Yajña which were observed could be because of the use of medicinal plants and procedure involved in Yajña. So Yajña can be performed not only as a traditional practice but also as therapy for effective stress management.

Key-words: Yajña, Yogāsana, Mantra, stress and EPI
INTRODUCTION

Each philosophy has certain practices that form the essence of that philosophy. Yajña (fire ceremony involving offerings selected substances) holds a supreme position in Indian culture. All the auspicious performances in Indian tradition admit worship of Agni (the sacred fire) as an important component. Selected and specified materials are offered to Agni in multifold along with chanting of Veda Mantras as appropriate to different Devatas (deities or cosmic centers in creation). Throughout ages, fire has been venerated as a symbol of Spirit. The first hymn in Rig Veda is related to Agni:

"I invoke and worship Agni light of life, self-refulgent lord of the universe, foremost leader and inspirer, blazing light of Yajnic creation, high-priest of cosmic dynamics, controller of natural evolution, and most generous giver of the treasure of life" (Ralph T. H. Griffith, 1896)

Ayurveda (Knowledge of Life and Science of Living) postulates that manifestation of diseases is caused by the impressions from the previous births, environment, our relation to people and the world etc. There are multifarious methods to identify and cure diseases in Ayurveda. Diseases can be managed through Japa (repeating a sacred name of particular God), Homa (fire offering) and Surarchana (worship of God). A Mantra from Rig Veda comprehends the result of performing Yajña with a specific note: Yajāmahe saumanasāya devān|| (Ṛig Veda || 1-173-2) meaning ‘We perform Yajña in favour of Devatas for sanctification and bracing the Manas (an aspect of Mind)’ along with other facets of inner tools (Antahkarana) in order to reach intended goal.
YAJÑA AND ITS BASIS

The Sanskrit word ‘Yajña’ etymologically means ‘to worship’, ‘to unite or connect’, ‘to do charity unconditionally (Dāna) in right manner to the deserved (Gyanashruti & Srividyanda, 2006).

Pūrva Mīmāmsa, one of the schools of Indian philosophy, proclaims that - *Devatoddēśena dravya tyāgaḥ* meaning for the purpose of satisfying the deities, we give oblations to them. Yajña is the procedure of offerings to deities. (Bheemacharya, 2011)

One of the texts explains Yajña as a combination of offerings to Devatas, recitation of Mantras from three Vedas with Ṛtviks (performers of Yajña), and Dāna (acknowledgements or respecting noble people). (Acharya, 1998)

Yajña is a systematic process in which herbs are offered along with recitation of Mantras to accelerate the process of harmonizing the creation and human life. Smoke generated in a Yajña has medicinal value because of herbs offered into Agni; hence inhalation of the smoke brings changes in physical structure in human. This action purifies Mahāprāṇa (Raju Krishna Murti, 2007). In addition to it, Yajña influences spiritual values and life style changes (Rawat & Hr, 2007). Chanting of Mantras produces vibrations which makes human body to resonate to Mantras’ mystic powers and responds in greater manner (Yogitha et al., 2010). These vibrations reverberate and spread specific energy waves in the surrounding atmosphere while the oblations are offered with specific chants (Rawat & Hr, 2007). So Yajña has physical, psychological, spiritual and social value.

The entire process of a Yajña, consisting of mantra chanting, lighting the sacrificial fire and offering *Havis* to the gods in the form of ghee, *Vanaspati* (materials from plants and trees) and other objects, purifies the environment significantly. In fact, Yajñas have been successfully
performed even in modern times to induce rainfall, to check spread of epidemics, and for various mundane and spiritual purposes.

With reference to Yajña, Śrī Kṛṣṇa says in Bhagavad-Gita, "The devotees of the Lord are released from all kinds of sins because they eat food which is offered first in sacrifice. Others, who prepare food for personal sense enjoyment, verily eat only sin." [Bhagavad Gita 4.31] “Serve the gods through Yajña and let the gods be gracious to us. Thus, each serving the other selflessly will attain the highest good.” [Bhagavad Gita 3.11] (Goyandaka, 1988) “Through Yajña, deities went to heaven, enmity transforms to friendship, so Yajna is considered to be the greatest performance one can deliver as an action. Oblations given to Agni reach the Sun, which in turn transforms that into clouds through vaporization resulting in rainfall and gives back in the form of food grains which is the base for human progeny.” [Manu Smriti 3.76] (Sheshanavartna, 2011)

**EPI Electron Photonic Imaging, also known as GDV (Gas Discharge Visualization)**

EPI was developed by Professor K. G. Korotkov on the basis of Kirlian effect. EPI is an instrument, which measures human energy field. It is computer registration and analysis of ‘Gas Discharge Glow’ (GDV-images) of any biological object placed in a high intensity electric field. EPI studies involve placing the object on a glass electrode and an electronic circuit provides a high-intensity electric field (with duration 10 microseconds applied with frequency 1024 Hz). As a result of impulse effect a sequence of gas discharge is formed during the specified exposure time. Spatial distribution of the glow emitted by the discharge is registered with a light-sensitive CCD matrix (a charge-coupled device) situated directly under the glass electrode.

**EPI Parameter**
Several parameters are derived from the image obtained in the EPI instrument. These parameters are related to functioning of physiological systems of the body. Overall activity of the body mind complex to stress inputs and balances in energy could also be calculated. We present here one parameter of importance, known as Activation Coefficient the details of which are presented below.

**Activation Coefficient**: It is one of the EPI parameters to analyze the level of a person’s involvement to stress-adaptation. This also provides the level of stress and balance of activity of sympathetic and parasympathetic nervous systems work. Table 1 gives the values of Activation Coefficient and the observed psycho-emotional states (K. G. P. D. Korotkov, 2002).

<table>
<thead>
<tr>
<th>S.No</th>
<th>Activation Coefficient</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 to 2</td>
<td>Calm balanced condition meditator, slow / deferred response, sluggishness</td>
</tr>
<tr>
<td>2</td>
<td>2 to 4</td>
<td>Normal level of stress reaction, compensated, active emotional</td>
</tr>
<tr>
<td>3</td>
<td>4 to 6</td>
<td>Emotional excitement (driving, surgeons)</td>
</tr>
<tr>
<td>4</td>
<td>6 to 8</td>
<td>High emotional excitement, emotional overload</td>
</tr>
<tr>
<td>5</td>
<td>8 to 10</td>
<td>Psychological problems; inadequate state</td>
</tr>
</tbody>
</table>

**Methodology**

**Aim**

To compare the influence of Yajña and Yogāsana practice on the Activation Coefficient of GDV diagram in normal healthy individuals.

**Objectives**

1. To study the impact of Saraswati Yajña at psycho-emotional level of Yajña participants,
2. To study the psycho-emotional level in Yogāsana group, and

3. To compare the psycho-emotional level of Yajña group and Yogāsana group.

**Hypothesis**

- **Null Hypothesis:**
  
  \( Ho= \) There is no difference of impact of Yajña and Yogāsana on psycho-emotional level of healthy volunteers.

- **Alternative Hypothesis:**
  
  \( Ha= \) There may be some impact of Yajña and Yogāsana on psycho-emotional level of healthy volunteers.

**Research Design**

**Day 1**

Pre EPI test --------Yogāsana-------- Post EPI test

**Day 2**

Pre EPI test ------Saraswati Yajña---- Post EPI test

Design of the study was one group comparative study, between Yoga session and Yajña session; the two interventions were provided on two consecutive days.

EPI – grams were captured for all ten fingers of the subjects without filter and with filter in succession using EPI equipment. Then subjects practiced one hour of yoga taught by experienced instructors. Yoga session includes *Sūryanamaskāra, Pranayama* and Deep Relaxation Technique (DRT 5 minutes). After the practice, once again EPI parameters were recorded. Next day morning subjects were made to attend Yajña session. Yajña procedure includes *Gaṇapatī Pūja,*
Puṇyāha Vācana, Kalaśa Pujā and Varuṇa Pūja, invoking and worshipping Saraswati in Kalasha, chanting of particular Mantras, offering oblations with Mantra chanting and Prārthana or prayer. EPI parameters were recorded before and after the Yajña session recorded.

Sources of Subject

Participants were from various countries who recently went through one month of YIC (Yoga Instructor Course) at Praśānti Kuṭīram, SVYASA Yoga University, Bangalore. Sample size (n) is 18 (6 females, 12 males).

Inclusion Criteria

- Willing to participate in the study
- Both male and female subjects were selected for the study.

Exclusion Criteria

- Participants with missing fingers
- Females during their menstrual cycle and pregnancy,
- Those who have cardiac, neurological and psychological problems.

Ethical considerations

- Signed Informed consent of the respondents were obtained before the start of the intervention,
- The participants in the study were explained about the nature of the study in detail

Interposition / Intervention

For Experimental session:
Saraswati Yajña was designed referring to the classical texts. The Yajña program (70 minutes) was as follows:

1. Prātasmaraṇa stotra (morning prayer) (3 minutes)
2. Gaṇapati puja (worship of Ganapati to remove obstacles) (4 minutes)
3. Puṇyāha vācana (selected Mantras for auspiciousness) (10 minutes)
4. Kalaśa puja and Varuṇa puja (installation of deities in copper pot and worship) (10 minutes)
5. Sthalaśuddhi and Agnisthapāna (cleansing the place and installation of Fire) (10 minutes)
6. Chanting of Saraswati Mantra 108 times (20 minutes)
7. Offering holy sticks along with Saraswati mantra (10 minutes)
8. Prārthana or prayer (concluding prayer) (3 minutes)

The Yoga session (60 minutes) is as follows:

1. 10 minutes loosening practice
2. 10 minutes breathing practice
3. 10 minutes Sūryanamaskāra
4. 10 minutes Pranayama, and
5. 20 minutes deep relaxation technique (DRT)

DATA COLLECTION

On the first day subjects were asked to come at 05.00 A.M. in the morning on empty stomach. GDV-grams were captured for all ten fingers of the subjects first without filter and then with filter using GDV-camera. After the practice, once again GDV parameters were recorded. Next day morning subjects were asked to come at 05.00 A.M. on empty stomach and participated in a Yajña session. GDV parameters were recorded before and after the Yajña session.
Appendices

Data Analysis

All variables were expressed as mean ± standard deviation. A paired sample t-test was used for analysis of pre-post changes in the two groups. Statistical significance was set at p < 0.05, and all the analyses were performed using SPSS 12.00 software.

Results

Shapiro-Wilks test was used for normality test. The data were normally distributed with p>0.05. To assess the impact of session (pre-post assessments) paired sample t-test was used within the group. The results are tabulated in the tables below.

Table 3: Yajna and Yoga Session pre-post recordings

<table>
<thead>
<tr>
<th></th>
<th>Pre Mean</th>
<th>Pre SD</th>
<th>Post Mean</th>
<th>Post SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoga Session</td>
<td>2.82</td>
<td>.97</td>
<td>3.65</td>
<td>1.98</td>
<td>.105</td>
</tr>
<tr>
<td>Yajña Session</td>
<td>4.09</td>
<td>1.88</td>
<td>3.19</td>
<td>1.47</td>
<td>.021*</td>
</tr>
</tbody>
</table>

*p<0.05 comparing the pre and post scores using the Paired sample t-test

Changes are observed in both groups but Yajña showed statistically significant result compared to Yoga session. Significant reduction in Activation Coefficient, [p = 0.021] was seen in Yajña session but not in Yogāsana session.

Fig 1: Comparison of Activation Coefficient of Yoga and Yajna sessions, pre and post
Discussion

The result shows that P-value is statistically different when two groups are compared to each other. Mean and standard deviation of Activation Coefficient changed more in Yajña session indicating the influence of reduction in stress level during Yajña.

1. Yajña involves a set of performances. The deity on which Yajña is being performed is meditated on deeply by all who are gathered there. The process of pondering upon one subject (deity or ritual in the context of Yajña) makes mind to concentrate and slow down breathing, subsequently influencing the state of the mind. Hatha Yoga Pradīpika provides strong relation between breath and mind; if mind is roving the breath is unsteady, meaning breathing pattern is highly disturbed and if the breathing is disturbed so is the mind.

2. Ayurveda incorporates Dhūmapāna (inhalation of prescribed smoke) in dinacarya (daily routine) for many diseases as a therapeutic practice. Smoke emanating during Yajña facilitates body to be energized through inhalation of the specific ingredients that are offered to fire. Thus it is hypothesised that stress level could come down. (11).

3. A recent paper has shown unequivocal increase in brain blood flow when there is oxygen deficit in the brain. The deficit comes about when a person suspends breathing for as short a time as 15 seconds. MRI shows increase in brain blood flow in wide areas of the brain due to increased CO2. In case of reduced intake of oxygen, a similar response could be visualized whereby there is a gradual increase in arterial PCO2. “Carbon dioxide is a cerebral vasodilator; therefore, an elevation in PCO2 will subsequently increase whole-brain cerebral perfusion, resulting in a decrease in the deoxyhaemoglobin concentration of the cerebral blood and ultimately a whole-brain increase in the …. fMRI signal”. Thus, Saraswati Homa smoke from fire wood could cause better brain blood flow through internal feedback mechanism leading to reduced stress level indicated by Active Coefficient.
4. Participants were asked to chant Mantras related to one of the deities, Saraswati. Recitation of Mantra in particular – which has an emotional component – could influence the person to calm down and hence bring down stress level. Subjects were educated about Mantras and the connected Devata of Mantra which made them focus towards recitation. This focus could also have caused reduction in stress level.

5. Though there is an increase in Activation Coefficient in Yogāsana session, these tend to bring balance in autonomic functions, including sympathetic and parasympathetic nerves in the optimal range indicating normal stress level, at eustress level. Hence it is inferred that stress level increase from Yogāsanās are balancing than aggravating.

6. It has been shown that the physiological benefits of Yoga could have a dose-response behaviour. In other words, the more one practices Yoga, the more are the benefits seen [13]. Thus, a short session of Yoga could be only a start of a long process and may not indicate beneficial effects as seen in this study. To have a good comparison, at least three months of yoga practice is required before we could say with any certainty if one procedure is better than another.

7. Yagna, if performed properly needs special persons who could chant the Sanskrit verses with correct intonation and style. It is also expensive to perform a yogna. Thus, performing yogna at home or in a temple is a consorted effort, needing resources that are usually kept for special occasions only. Yoga on the other hand is a self-help procedure and could be easily learned and performed anywhere in the world. Regular practice of Yoga could help in many areas, including in the management of stress.

8. It is possible that ‘meditative component’ is strong in Yagna and not as much in this particular practice of yoga. Effectiveness of meditative components in reducing stress through central processing of information has been demonstrated in studies [14]. Yoga, as practiced here, has no specific meditative component whereas Yagna is based on dharana or withdrawal of the senses.
and concentration on mantra and the devata. Thus, it is not surprising that Yagna is more effective in reducing stress-related components in EPI.

9. Thus, while short term benefits are seen in Yagna performance, practicality of learning and practicing Yoga along with meditation is an important adjunct in the management of stress in individuals.

CONCLUSION

Yajña, a spiritual practice mentioned in various ancient texts of Indian philosophy, showed therapeutic effects which are also mentioned in texts. Medicinal plants and ghee are the main materials for Yajña. This study has shown that one hour of Yajña can reduce stress level more efficiently than one hour yoga session as measured by Activation Coefficient of EPI-gram. Thus, Yajña can also be practiced for more effective results for stress management programs. However, it is also be noted that Yoga practice can be useful in balancing the energy system in a person.

ACKNOWLEDGEMENTS

We thank the participants of YIC-143 who agreed to become subjects for the research. We thank Kuldeep, Dr. Vijay Kumar, Dr Ramachandra Hegde, Bhagat, Sanjay, Viswajit, Anusha and Shailesh for giving the precious time to collect data, without who it would have been impossible to accomplish this study. We thank the coordinators of the YIC and Yoga & Consciousness course who have given this opportunity.

REFERENCES


Effect of Bhaishajya Maha Yajna on Human Energy Field and Environment

*SUSHRUTHA S¹, KRISHNA MADAPPA², HONGASANDRA R NAGENDRA³

Abstract

Objective: Positive influence of Yajna (fire ceremony) on human physiological, psychological and spiritual well-being and environment is mentioned in ancient Indian literature. The purpose of this study is to explore how Bhaishajya Maha Yajna influences the human energy field measured with Electro Photonic Imaging (EPI) technique to follow the response at individual level and also to observe the pollution level in the environment before and after.

Methods: Electro Photonic Imaging method was used to assess the subjects. The subjects were from Kerala practicing a special type of Yoga lead by an expert, some of whom were actively involved and others just observing Yajna. Bhaishajya Maha Yajna was performed in outskirts of Bangalore, continuously for 81 hours during two consecutive years 2013 and 2014. The participants were assessed three times; at fixed intervals of 27 hours from the base reading. After getting informed consent from the participants, 29 and 21 were the sample size respectively in the two years. EPI Measurements were made on all ten fingertips of subjects, the patterns of light emitted from the subjects’ fingertips were digitally recorded and computer analyzed. Parameters including Area, Average Intensity and Entropy were calculated and statistically compared between three measurements. SPSS version 18.0 was used for the analysis. Pollution level was measured using Enviro-Tech, a standard environmental test equipment to observe the level of SO2, NO2 and RSPM.

Results: Two times observations showed statistically significant positive changes in both years. Among three parameters Entropy was maintained constantly at a fixed level, while others (Area and Average Intensity) showed statistically significant changes in both years. In general, the changes between first and second measurements showed greater alterations than between second and third reading in EPI parameters. Forty three percent of reduction in Sulphur Dioxide was observed in the environment.

Conclusions: Attending this Yajna influenced EPI parameters of finger emission patterns significantly and thus supported the objective of the study. EPI seems to be an appropriate tool to measure subtle energy filed. Yajna can be one of the practices to invoke the potentials of human internal energy. The performance of Yajna helps in cleansing the environment of certain pollutants.

Key words: Yajna – EPI/GDV- human energy filed – Offerings – Environment
Introduction

The scriptures of India pronounce that the goal of human existence is towards self-realization. This is also known as Moksha or release from our cyclic existence in this world. The attainment of Moksha is through several methods, one of them being the performance of Yajna. Yajna is performed in India for both one's own spiritual advancement and for the welfare of humanity. This practice has being followed from time immemorial [1].

Performance of Yajna involves offering Dravyas (sacred materials) into fire. At the initial level the offerings are of physical items followed by offering subtle facets of one’s being which includes emotional and intellectual aspects symbolically into the fire. Bhagavad Gita [4. 24-31] enumerates different Yajnas; “Some offer hearing and other senses as sacrifice into the fire of restraint; others offer sound and other objects of sense into the fire of senses, some others again offer sacrifice with the functions of senses and those of the breath (vital energy), into the fire of Yoga of self-restrain, kindled by knowledge” [2].

Indian practices such as Yoga and Yajna bring stress levels to normal. Factors such as smoke coming out Yajna Kunda (sacred pit), correct method of chanting Veda Mantras, knowing the background concepts of tradition etc cause reduction in stress levels facilitating health maintenance at optimal level [3].

Objective observations, based on research and scientific evidences during experimental field studies found Yajna to be one of the most economical means of purifying environmental pollution. Emissions during Yajna are not only non-toxic but are beneficial to the environment. Agnihotra is a very simple method of performing Yajna or offering oblations to fire at the transitional moments of sunrise and sunset. Sunrise and sunset are the shortest rhythmic cycles of nature and they leave their immediate effect on living beings [4]. Ash collected from the bottom of the sacred pit showed mineral value and therefore this ash has been used in agriculture farms for healthy growth of plants [5].

To analyze the ash content after Agnihotra, the ash is mixed with water after 48-hour of conclusion of Agnihotra. It was found that Agnihotra-ash may increase the amount of extractable P in soil; this effect was also generated with a non-Agnihotra-ash, which was produced without chanting a mantra, and not necessarily at sunrise or sunset. There was particularly larger amount of P in soil when non-Agnihotra ash was produced in a copper pyramid. A possible explanation may be the time of soil / ash contact, which may have been too short in the two latter extraction methods to allow the subtle energetic forces to unfold their effects [6].

Agnihotra research at SVYASA University showed significant changes in seed germination parameters from the data during three seasons, autumn, winter and summer conducted for a period of 15 days each. Four parameters, viz. root length, shoot length, fresh weight and dry weight were measured of seed germination. An analysis of the data showed that the Agnihotra sacrifice with mantra was overwhelmingly more effective in the germination process than control conditions [7].

There are other studies that seem to measure emotional imprints in the environment by recording the changes in randomness of certain fundamental physical processes. One such instrument is known as Random Event Generator (REG) which records the randomness of electronic generation from a semi-conductor diode. The randomness changes towards more order when the system is exposed to increased-ordering in the environment. The reason for this may be due to positive emotions in the environment. Emotions are powerful thoughts according to Yoga. These powerful thoughts are cancelled when the waves associated are out of phase and the thoughts get into resonance when the phase and frequency are matched [8]. One of the studies could trace the significant changes between chanting of Gayatri Mantra and Random Thinking sessions. During Gayatri mantra chanting, REG show patterns that imply breaking of randomness in the surrounding environment when compared to Random Thinking session [9].

The cosmic biological and psychological effects influence significantly the biological and psychical, collective and individual organizational processes. The cosmic connections between Man and Universe do not represent a one-sided action, but a mutual, meaningful, life-giving interaction, in which Man is also an active participant if humankind accepts the challenge of fulfilling its original, natural destination [10]. Traditional cultural practices have much impact on the social condition and have a role in the healing process to large extent. These practices increase the functional intelligence of the species as discussed by Dr. Robert [11].
Music and other collective performances greatly influence the collective conscious level by bringing positive changes in the environment. With a suitable measurement method such as EPI, it is possible to observe the changes in the environment objectively [12].

It is very important to show evidences from Puranas (subordinate texts for understanding deeper Vedic concepts and ideas) and Itihasas (history of Indian culture and practice in particular) which exhibit numerous references for physical and meta-physical results due to rituals such as Yajna, Yoga, Mantra, Tantra etc. The present study pays attention to both individual and collective changes when Yajna is performed following specific method (especially herbal offerings) developed by a spiritual master from southern India.

Materials and methods

Samples A. Sample for EPI – The subjects of interest for this study are members of a group led by a spiritual master from Kerala, southern India. These subjects are actively involved in the entire process of performing Bhaishajya Maha Yajna (BMY) by following certain practices: conducting brief Yajnas every month, collecting holy sticks for annual Yajna, collecting firewood, preparing necessary oils etc. These subjects (29 in 2013, 21 in 2014) have age ranging from 20 to 40 (males and females), who were ready to volunteer for the study. Subjects were asked to fill the consent form to acquaint them with entire procedure and make sure regarding volunteering for the study without any emotional disturbance. Majority (70%) of the subjects were from Kerala and some (10%) of them were from the neighboring villages, practicing specific Yoga Module framed by Rishidev Narendran Ji, and the rest (20%) of them were newly introduced to this group.

Table 1 – Details of sample size of Yajna participants

<table>
<thead>
<tr>
<th>Year</th>
<th>Details</th>
<th>No</th>
<th>Age Range</th>
<th>Mean Age</th>
<th>Observer</th>
<th>Active Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Males</td>
<td>26</td>
<td>15 - 45</td>
<td>34</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>3</td>
<td>36 - 40</td>
<td>38</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>29</td>
<td>15 - 45</td>
<td>34</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>2014</td>
<td>Males</td>
<td>8</td>
<td>19 - 40</td>
<td>36</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>13</td>
<td>18 - 41</td>
<td>27</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>29</td>
<td>18 - 41</td>
<td>30</td>
<td>0</td>
<td>21</td>
</tr>
</tbody>
</table>

The Electro Photonic Imaging (EPI, also known as Gas Discharge Visualization - GDV) measurement was taken three times from the baseline with fixed interval of 27 hours. This specific study is repeated two times in consecutive years Jan 2013 and Feb 2014. Both Yajnas started by 6.00 AM.

Bhaishajya Maha Yajna

<table>
<thead>
<tr>
<th>Pre 6.00 AM</th>
<th>Assessment 1 (9.00 AM) after 7 hrs</th>
<th>Assessment 2 (12.00 PM) 54 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2013</td>
<td>24.01.2013</td>
<td>25.01.2013</td>
</tr>
</tbody>
</table>

EPI was developed by Russian scientist, Dr. Konstantin Korotkov in 1996 to capture, map and analyze the electromagnetic field emanating from the human body in response to pulsed electrical field excitation. In response to the electrical stimulus given to the body (fingertip), a weak “electron cloud” forms near the surface (of the fingertip), and is amplified by excitation of the molecules in the surrounding air molecules resulting in a glow which is captured by an optical CCD camera system and translated into a digitized computer image.

Traditional Chinese Medicine recognizes that images of the whole body are found in each organ or region of the body. Systems of complementary medicine in the west term these phenomena ‘Reflexology’, and use them in systems of diagnosis and massage etc. [13]. The phenomenon of fingertip diagnosis in EPI is an example of reflexological diagnosis applied to the fingertips, using Pranic Energy Fields, which are the media through which reflexological maps arise.
EPI Test-retest reliability of baseline values have an overall variance of 0.236 and a standard deviation of 0.387. Variance in patterns of emission and calculated diagrams is about 10% for human fingers, and 3% for materials [14]; hence the instrument is of acceptable quality for research and has been used in various research investigations.

B. Samples for Enviro-Tech: Air samples were collected from the venue of Yajna performance, 50 meters away from Yajna Kunda (dimensions; 27 feet length and 18 feet width and 5 feet depth in elliptical shape). Collection of samples was performed before 24 hours of Yajna (from 23.01.2013, 6.00 AM to 24.01.2013, 6.00 AM) and after (from 27.01.2013, 3.00 PM to 28.01.2013, 3.00 PM).

EnviroTech is based on CSIR-NEERI technology and is the only PM 10 sampler that conforms to Indian standards (BIS 5182 (Part 23): 2006). Owing to its modular design, this model (APM 460 DXNL) can be easily paired with a gaseous sampling attachment (for monitoring SO2, NOx, NH3, Ozone etc). It also monitors Respirable Suspended Particulate Matter (RSPM) concerning the health issues related to particle size in air of the surrounding area during respiration. Optimum level of RSPM differs from region to region within the country (Central Pollution Control Board, India).

Intervention

Bhaishajya Maha Yajna is a ritual initiated by Rishidev Narendra Ji near Bommandahalli, Jigani, Bangalore. Two hundred and sixteen herbal Samits (holy sticks) were used which were collected yearlong according to a standard procedure. The Yajna continued for 4 days and 3 nights. There were 81 anti-social themes (such as accidents and violence) identified for nullifying during this Yajna. During each hour varieties of Samits were offered to counteract anti-social activities. Veda chanting from Rgveda and Yajurveda was continued throughout Yajna to create a spiritual ambience. Three types of base firewood were used. Nine types of plant based oils were offered. The name of Yajna itself is self-explanatory. Bhaishajya (Bhishak - medicine related) indicates the relation of the ritual for curative purpose at physical, pranic, psychological, social, intellectual and spiritual levels which may be personal, interpersonal and intrapersonal.

Procedure of Bhaishajya Maha Yajna

- Preparation for BMY will start one year prior to the Yajna
- On every full-moon-day the volunteers collect Samits (selected sacred sticks)
- Sacred fire (Agni) will be brought to the venue of Yajna
- By 6.30 AM on the day of start of Yajna, Agni will be installed in Agni Kunda
- Samits will be offered every hour for a total of 81 times
- Three types of base firewood will be used
- At fixed timings deities will be invoked to receive oblations

Results

EPI parameters

Table 2 – Changes in the EPI parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Time</th>
<th>6:00 AM</th>
<th>9:00 AM</th>
<th>12:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td>10756.96</td>
<td>1490.40</td>
<td>9357.10*</td>
</tr>
<tr>
<td>Intensity</td>
<td>2013</td>
<td>75.26</td>
<td>6.50</td>
<td>69.18*</td>
</tr>
<tr>
<td>Entropy</td>
<td>2014</td>
<td>1.99</td>
<td>0.07</td>
<td>1.96</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td>8707.24</td>
<td>901.19</td>
<td>9605.37*</td>
</tr>
<tr>
<td>Intensity</td>
<td>85.66</td>
<td>6.37</td>
<td>90.25*</td>
<td>5.32</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>Entropy</td>
<td>2.00</td>
<td>0.10</td>
<td>1.99</td>
<td>0.04</td>
</tr>
</tbody>
</table>

* P<0.05.

Area - A repeated measure of ANOVA showed, that for 29 people in 2013, the area (number of pixels in EPI images) of three measurements were statistically different, F (2, 56) = 4.406, p = 0.017, partial η² = 0.136. The post-hoc analysis for three measurements confirmed the statistical difference between first measurement (10756.96 ± 1490.40) and second measurement (9357.10 ± 1722.62) p = 0.017. However in 2014, for 21 people, F (2, 40) = 7.977, p = 0.001, partial η² = 0.285. Post-hoc analysis showed that first measurement (8707.24±901.19) and second measurement (9605.37±751.68) were statistically significantly different, p = 0.001, and first measurement (8707.24±901.19) and third measurement (9381.43±798.71) were also statistically significant, p = 0.033.

Average intensity - A repeated measure of ANOVA showed, for 29 people in 2013, the Average Intensity between three measurements were statistically different, F (2, 56) = 10.571, p < 0.001, partial η² = 0.274. The post-hoc analysis showed the statistical difference between first measure (75.26 ± 6.50) and second measure (69.18 ± 5.21), p < 0.001, and second measurement (69.18 ± 5.21) and third measure (72.32 ± 6.91), p = 0.047. For 21 people in 2014., a repeated measures of ANOVA showed significant difference, F (2, 40) = 15.163, p < 0.001, p < 0.001, partial η² = 0.431. Post-hoc analysis showed significant difference between first measurement (85.66 ± 6.37) and second measurement (90.25 ± 5.32), p < 0.001, and first measurement (85.66 ± 6.37) and third measurement (90.14 ± 5.39), p < 0.001.

Entropy - A repeated measure of ANOVA did not show statistical difference, for 29 people in 2013, between three measurements, F (2, 56) = 1.324, p = 0.274, partial η² = 0.045. A repeated measure of ANOVA in 2014, also for 21 people, between three measures did not show statistical difference, F (2, 40) = 0.262, p = 0.771, partial η² = 0.013.

EnviroTech results

Table 3 - EnviroTech standard values and experimental values

<table>
<thead>
<tr>
<th>Standard Values</th>
<th>Respirable Suspended Particulate Matter</th>
<th>Sulphur Dioxide</th>
<th>Nitrogen Dioxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>100 µg/m3</td>
<td>80 µg/m3</td>
<td>80 µg/m3</td>
</tr>
<tr>
<td>Post</td>
<td>66</td>
<td>53</td>
<td>37</td>
</tr>
<tr>
<td>Change Value</td>
<td>109</td>
<td>30</td>
<td>42</td>
</tr>
<tr>
<td>Percentage</td>
<td>43</td>
<td>23</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3 gives standard values of Respirable Suspended Particulate Matter, Sulphur Dioxide and Nitrogen Dioxide along with pre-post Yajna values.

Interpretation

Area: the number of pixels in the image having brightness above a pre-set threshold. It is observed that area shifts in diverse situations; ex – Yajna, Yoga, types of meditations. Increase in area is indicated by an increase number of pixels. In the two Yajna observations the data convey as follows.

Chart 1 – Line graph of Area in EPI diagram during measurements in 2013 (line with blue triangles) and in 2014 (line with red squares).
In 2013 Yajna, it is observed a heightened initial start, a gradual decline and levelling as the Yajna progresses. Yajna of 2014 shows a lower start value compared to 2013, rapidly increasing and levelling as the Yajna progressed reaching similar value to 2013.

**Average Intensity**: is an evaluation of the Intensity spectrum for the pixels in the images indicating electrophoton discharges. We can observe average intensity shifts in diverse conditions: ex – Yoga, Yajna, types of meditations.

Chart 2 – Line graph of Average Intensity during Yajna in 2013 (line with blue triangles) and in 2014 (line with red squares).

In 2013, the Average Intensity declined slightly from the base observation and levelled. The base value was larger in 2014 indicating the preparedness and willing of participants (all of whom have attended in 2013) to take part in Yajna. Then the intensity remained constant and settling to its optimal state.

**Entropy**: this is an indicator of the level of chaos and disharmony in the system.

Chart 3 – Line graph of Entropy levels during Yajna in 2013 (line with blue triangles) and in 2014 (line with red squares).
There is a reduction in entropy in 2013. In 2014, it is observed to be stable during the Yajna.

Discussion

Bhaishajya Maha Yajna (BMY) was conducted in two consecutive years (2013 and 2014) and shows significant results in human energy field and environmental pollution levels. The following factors are to be considered while observing results due to the performance of subtle practices such as Yajna, Yoga and Tantra etc. Vedic esoteric practices have integrated developmental approaches rather than concentrating only on few selected individual aspects of entire human and environmental systems.

In the two years of Yajna related research, we have looked at both individual levels of subtle energy and environmental factors related to pollution. Two devices were used: EPI system for human energy monitoring and EnviroTech for assessing environmental pollutants.

Area – The results indicate that Yajna improves area (number of pixels) of the EPI images denoting high metabolic rate in human systems. This would imply proper utilization of metabolic energy and optimization of biological processes in the body. It is seen that in both years, though separated at the start of Yajna, the area values tend to be normalized at appropriate value for optimal metabolism. Since BMY involves offering herbals into fire, smoke coming out of Kunda stirs the system towards health. Results support the logic that Yajna could be a tool for the better performance of the human system. Similar fact is reflected in a study where Yogasana and Yajna were compared for measuring stress level. Yogasana group showed below normal Activation Coefficient (AC) (0.0 to 2) before the practice and ended up at normal values AC (2.0 to 4.0), showing optimal stress response. Though there were high values of AC (4.0 to 6.0) indicating high stress level before Yajna, it came to normal values AC (2.0 – 4.0) after Yajna [3].

Average Intensity – The results show the capacity of the human system to facilitate support of any process towards healing. Generally both Area and Average Intensity are the measures of this ability. Heightened Average Intensity values in 2014 compared to 2013 values confirm that preparedness and willingness of participants to accelerate process of healing and energizing towards spiritual growth.

Entropy – The results evidently show that reduction of Entropy in 2013 is higher than in 2014. Other studies also support that first time response to intervention is greater than the subsequent ones for repetitive practices. Participants of Yajna were so excited about performance and procedure of Yajna in 2013 that the reduction of Entropy was much higher than in 2014. Consistency of Entropy values was maintained in 2014 throughout Yajna and this confirms that disharmony and chaos were not extreme but stability was established in human systems.

EnviroTech – The results prove that performance of Yajna reduces certain pollutants in the air. Medicinal values in herbals (216 types of plants, 3 extracted oils and banyan logs as firewood) could have helped nature to discard pollutants especially sulphur dioxide which causes acid rain and many diseases in living organisms. “The colloidal molecules of cow’s ghee and other constituents could bind, attract and grab pollutants in the air. The seized molecules as they settle on the ground would alkalize the soil. When they come in contact with plant, they could stick to leaves and act as a time-release foliar nutrient. Physically, because of the ghee, the smoke could be electrically charged” [5]. In Ayurveda, prescription of herbals in varied dosages and combinations for different diseases is common. The very name and purpose of this Yajna itself aims at bringing health to all living beings in cosmos. However, Respirable Suspended Particulate Matter (RSPM) was high in number after the Yajna because of ash nanoparticles released from Yajna Kunda. This may not disturb living beings’ health; on the contrary, it could support Ayurvedic concept that inhalation of smoke being health promoting, especially during a Yajna. Further, as Ayurveda decrees Dhupapana (smoking of prescribed herbal plants) is health promoting in daily therapeutics; thus it is presumed that the smoke may not disturb the health of those taking part in the Yajna and might even support healthy outcome in people. This of course, needs to be tested further.

Conclusion

Human energy field alters positively to external stimulus such as Yajna and any ritual if followed according to the procedure mentioned in the scriptures. Performing Yajna reduces certain pollutants in the environment.

Acknowledgement
Appendices

Authors of this article thank Rishidev Narendran Ji, Mata Sripriay and entire team of Jeeva Yoga, Bangalore. We thank KSPCB, State Govt. Karnataka, for support in measuring pollutants’ level. We would like to thank Prof Ramachandra G Bhat, VC, SVYASA University and Prof TM Srinivasan for giving valuable time in editing the paper.

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