

Health Information Science

MEDICAL

Health Care  
Doctor  
Hospital  
Nurse  
Pharmacist  
Dentist  
First Aid  
Surgeon  
Emergency

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# Computational Intelligence in Healthcare

 Springer

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ISSN 2366-0988

ISSN 2366-0996 (electronic)

Health Information Science

ISBN 978-3-030-68722-9

ISBN 978-3-030-68723-6 (eBook)

<https://doi.org/10.1007/978-3-030-68723-6>

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

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# Measurement of Human Bioelectricity and Pranic Energy of Different Organs: A Sensor and CPS-Based Approach



Rohit Rastogi, Mamta Saxena, Devendra Kumar Chaturvedi, Mayank Gupta, Neha Gupta, Umang Agrawal, Yashi Srivastava, and Vansh Gau

**Abstract** The Kirlian photography is one of the most spectacular ways to shoot different subjects. It is a technique based on electrical coronal discharge. It may be quite a mystery for the beginners in the art of photography. It shows the auras of different subjects. In this technique, the photographic plate made of metal is charged with a high-voltage source. It may seem hard to master this, but let me tell you it is still easier to shoot objects using Kirlian photography. The process is also quite simple. All an individual needs is to ready all equipment. It is recommended to use transparent electrodes instead of the discharge plate. It is a very interesting method to capture the coronal discharge of certain subjects. It will surprise you every time! The present manuscript is an effort by the researcher team to discuss the human bioelectricity and measure the different biophysical factors and reasons of different ill symptoms. We have tried to investigate the energy balances, head, and immune and musculoskeletal systems of subjects under study.

**Keywords** Kirlian photography · Bioelectricity · Covid-19 · Happiness · Radiation · Head · Immune · Musculoskeletal systems

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Nature Switzerland AG 2021

A. K. Manocha et al. (eds.), *Computational Intelligence in Healthcare*, Health Information Science, [https://doi.org/10.1007/978-3-030-68723-6\\_1](https://doi.org/10.1007/978-3-030-68723-6_1)

## 1 Introduction

### 1.1 *Human Bioelectricity*

The electric current continuously flows in the human body (termed as bioelectricity) that plays a vital role in physiological conditions. The human body consists of millions of nerves which transfer information and are responsible for the whole functioning of the body through electrical impulse which is actually bioelectric signals. So we can term bioelectricity as the electric current which is present inside the living body or produced within it. The number of biological processes occurs every second in the human body which leads to formation of bioelectric currents. Bioelectric currents and potential of human cells and tissues are recorded by machines like ECG, EEG, etc., which can be used in making medicines for various organs of human. Consciousness simply means awareness of both internal and external existence of self. Till now, despite of analyses, explanation, and researches, consciousness is still a topic of debate among scientists. Opinions of every philosopher and scientist vary from one to another. In recent days, consciousness is now a significant topic in cognitive science. Even we can measure the degree of consciousness by behavior observation scales. The famous scientist Locke defined consciousness as “the perception of what passes in a man’s own mind.” Ned Block suggested that there are two types of consciousness named as phenomenal (P-consciousness) and access (A-consciousness).

### 1.2 *Global Understanding on Consciousness*

Consciousness can be seen as a role of energy in our brain. Any type of activities requiring energy done by the body involves physical processes leading to biological behavior. This product of energetic activities in our brain is termed as consciousness. The consciousness and functioning of the brain is related to each other in some or other way.

Brain operates on some principles of energy processing, and this presence of energy in the brain with some additional techniques, the presence of consciousness, can be predicted. Thus, the consciousness can be termed as not only presence of mind but presence of some kind of energy that drives various activities taking place in our brain [32].

Meditation refers to a family of techniques which have in common a conscious attempt to focus attention in a non analytical way and an attempt not to dwell on discursive, ruminating thought. The term “discursive thought” has long been used in Western Philosophy and is often viewed as a synonym to logical thought.



### 1.3 Kirlian Photography

Kirlian photography is contact print photography which is connected with high voltage. In 1939, Semyon Kirlian found that if an object on photographic plate is exposed to strong electric field, an image of object will be created. He claimed that this discovery gives the proof of supernatural auras. These photographs are considered to be mysterious and controversial over the years. Although Kirlian discovered this method in 1939, he didn't make it public till 1958. The machine that was used in this process was a spark generator which works at around 75 kHz. As Kirlian claimed that the images, so produced, showed aura of living entities, his machine trends among the professional scientists [7]. After the success of this experiment, Kirlian became very popular. All magazines and newspaper were flooded with the success story of Kirlian; even a short educational film was produced on this experiment. The physiologist Gordon Stein wrote that Kirlian photography is only a hoax and it had nothing to do with vitality and auras of living being. In order to verify that claims of Kirlian were true, a typical experiment was done on a leaf which is popularly known as torn leaf experiment.

Photography is one of the most visual medium to capture something. There are a wide variety of techniques and aspects used in photography. The right use of these aspects can lead to unexpected results.

A similar technique was accidentally discovered in 1939 by Semyon Kirlian and his wife Valentina and thus given the name Kirlian photography. Once during their visit to a hospital, they noticed a patient receiving high-frequency generator treatment and that sparked in them an idea to conduct an experiment [30].

The Kirlian photography is also known to be as aura photography as it contains different auras/subjects. Their inventors claimed that it can be used to shoot different aura of living beings. The photographs resulted from this experiment also depicted force that surrounds every single being on this planet (Ref.: <https://www.pixsy.com/kirlian-photography-image-protection/>).

### 1.4 Energy Measurement

In physics, we define energy as the physical quantity which can only be transferred from one form to other. Energy can neither be created nor be destroyed. The SI unit of energy is joule. There are also other forms of energy such as kinetic energy (moving body), potential energy (position of body), and gravitational energy (gravitational force of earth). The most famous scientist of all time Albert Einstein said that energy and mass are correlated to each other, and he proposed his statement by eq.  $E = MC^2$ .

Every living organism needs energy to survive, and most of their energy they get from food they eat. James Prescott Joule was the scientist in honor of which SI unit of energy was named as joule. The units of measurement of energy is numerous,

among them well-known are tons used for coal, barrel for crude oil, cubic meter for gases, and liters for petrol and diesel. Besides joule, there are many other units of energy measurement such as kilowatt hour (which is widely used to calculate bill of electricity). The most common units measuring heat include the BTU (British thermal unit) and the kilogram calorie (kg-cal) [5].

There are two types of energy, where one is energy in rest and other is energy in motion. Energy is measured in various units. Some of them can be seen as:

- Joule (J)
- Watt which is joule/second
- Their definitions are the following:
- 1 Joule (J) is the MKS unit of energy which is equivalent to force of 1 Newton
- 1 Watt is the power of a Joule of energy per second

### ***1.5 Bioelectricity***

The electric current continuously flows in the human body (termed as bioelectricity) that plays a vital role in physiological conditions. The human body consists of millions of nerves which transfer information and are responsible for the whole functioning of the body through electrical impulse which is actually bioelectric signals. So we can term bioelectricity as the electric current which is present inside the living body or produced within it [9]. The number of biological processes occurs every second in the human body which leads to formation of bioelectric currents. Bioelectric currents and potential of human cells and tissues are recorded by machines like ECG, EEG, etc., which can be used in making medicines for various organs of human. All the bioelectric activities associated with the skin and tissue are used to make biomedicines. Till the eighteenth century, European physicians and philosophers believed that nerves transfer the information to the brain through some organic fluid, but later on two Italian scientists demonstrated the concept of bioelectricity. Emil du Bois-Reymond, a very famous scientist of that time, discovered that during any tissue injury a unique electric potential is generated, and he named bioelectric current as “the current of injury” [8].

### ***1.6 Pranik Urja***

The life energy which keeps us alive and strong is called prana or ki. The word prana is derived from Sanskrit word and is recognized by most of our ancient culture. It also means the breath of life. The more life energy that one person has, the more energetic and excited that person is. Pranayama is the nutrition of life. It is essential to keep the body healthy and happy. Sun, wind and ground are the major sources of Pranik Urja. The solar prana (or energy) can be obtained by sitting in the

sunlight for 5–10 minutes or by drinking water kept under the sun. The air prana is absorbed directly by our energy centers. It is obtained by slow and rhythmic breathing. Color prana or life energy is mostly of six types: red prana, orange prana, green prana, yellow prana, blue prana, and violet prana. And the pranic energy is mainly defined into two types: electric violet pranic energy and golden pranic energy [29]. “By remembering you are in an ocean of life energy, your life energy level will automatically increase.”

Pranik Urja means pranic energy (feel divinity all around you).

The main sources of these kinds of energy are solar, air, and the ground.

### ***1.7 The Human Body and Seven Chakras***

The human body is one of the most complex structures of living beings. It has millions and billions of cells, tissues, RBC, WBC, nerves cells, etc. The human body is the most developed and advanced structure, as it has brain (organ to think, very memory), heart (for blood circulation), lungs (for breathing), kidneys (to filter out toxics from body), etc. The study of the human body involves anatomy, and physiology. The main component of the human body is hydrogen, oxygen, calcium, carbon, and phosphorus. The human body contains several systems like circulatory system, digestive system, immune system, and many more. The human body is like a machine which runs only when energy is provided to it. It is said that there are seven chakras in the human body [15].

First one is root chakra (Muladhara); it represents the foundation of human and is located around spine base. Second is sacral chakra (Swadhisthana) which helps in dealing our emotions with others and located in the lower abdomen. Third is solar plexus chakra (Manipura) which represents our confidence and located around the upper abdomen. Fourth is heart chakra (Anahata); it is located in the chest center. Fifth is throat chakra (Vishuddha) which controls our communication and is located in the throat. Sixth is third-eye chakra (Ajna) and located between the eyes. Last is crown chakra (Sahasrara) which is found on top of our head [1].

Ours mental health depends on our outlook and our attitude toward everything. The way we think and the way we develop rapid thoughts are the reason we grow in life. Hence, there are some energy centers in our soul which give us energy to do anything. They are the following:

- Muladhara chakra – root chakra
- Swadhisthana chakra – sacral chakra
- Manipura chakra – solar plexus chakra
- Anahata chakra – heart chakra
- Vishuddha chakra – throat chakra
- Ajna chakra – third eye chakra
- Sahasrara chakra – crown chakra

All the above chakras lead us to live life and have their own significance [6].

## 1.8 *Aura of the Human Body*

The word “aura” means wind or breeze. It is believed that there exists an aura or human energy field. Since ancient times we see many pictures and paintings in which the human body is surrounded by a visible energy field known as aura energy field. The aura represents the mental, physical, and spiritual energy of being, and it also contains a mixture of different color frequencies in which each color has its own significance and characteristics. By scientific researches, scientists came across a conclusion that this aura actually is electromagnetic field of energy which comes out from a body of men and is 4–5 feet tall in the case of healthy person, but its strength reduces in the case of unhealthy person. Studies show that aura is associated with the human health. If a person is healthy in terms of physical vitality, mental clarity, and emotional well-being, then obviously that person will emit a positive spiritual energy. Today all scientists come across a result that the matter which appears to be solid is not real solid. These solids actually are made up of energy which is emitting frequencies; it is also confirmed that whenever there is an electric field, there develops magnetic field around it. So aura is an electromagnetic field of the body [11].

The human aura means energy field of the human body which acts as shield to the human body.

It is directly connected to energy centers of the body, the seven chakras discussed above. It creates an egg-shaped field aura surrounding the human body originating from the chakras. Actually, the truth is we all are interconnected. Still it's our thoughts which make us believe we're different. Actually this interconnectedness can be observed through the term human aura. Some examples of above arguments are feeling of love, anxiety, sadness, and fear [2].

## 1.9 *Yin and Yang Energy*

Yin and Yang is related to Chinese philosophy. Actually Yin and Yang is a concept of duality, i.e., the opposite poles. It is related to negative-positive, dark-bright, meaning things that are contrary to each other. Yin is receptive and Yang is active principle, and it is seen in every form such as annual cycle (winter-summer), sexual couples (men-women), etc. In Chinese cosmology, yin and yang are material energy from which the universe has created. Yin and yang are opposite of each other, and both are interdependent on each other. Both of them are necessity of life as they counterbalance each other, but they can't inter-transform each other. It seems that every human has yin and yang energy or good or bad side, and it depends on human to which side they prefer and what they become. Yin and yang is also present in symbol form in which yin represents white area and Yang represents black area. Yang energy is considered to be masculine, very expanding, active, energetic, and light. Some properties of Yang are heaven, sun, light, time, etc. [10].

It is a concept of dualism, meaning that even the forces which seem opposite or contrary can also be complimentary, interconnected, or interdependent in the natural world. These all actually give rise to each other. According to the Chinese cosmology, the reason of this universe is primary material energy which forms all kinds of objects and lives. In the concept of Yin and Yang, Yin is the passive, i.e., receptive, and Yang is the active principle. They can be seen in all forms of change. Some of them are annual cycle, sociopolitical history, sexual coupling, the landscape, and all other different laws of nature [14].

### ***1.10 Quantum Consciousness***

It was a failure of classical mechanics which was not able to explain consciousness and derived a group of hypothesis known as quantum consciousness. They proposed quantum-mechanical phenomenon like superposition that plays vital role in brain functioning of human and can easily explain consciousness. Also, it is believed that quantum idea is necessary for the brain to even exist.

There exists a strange link between the human mind and quantum physics. Nobody understands quantum and consciousness. It's because both are somehow related to each other. The classical mechanics cannot explain the human consciousness [16].

The consciousness emerges from complex computation among brain neurons which is similar to digital computing in quantum physics. Same as quantum can be used to understand the two various things at a time, the human mind can contain two mutually exclusive ideas at a time. Just as quantum is mysterious, same as consciousness.

Thus, consciousness is a manifestation of quantum processes in the brain.

Some still thinks consciousness is a mere illusion. Yet, the real origin of this is still unknown.

The famous “double-slit experiment” simply introduces the quantum mechanics in a more fashionable way.

The concept behind the term is that quantum theory may actually explain how the brain really works. Same as quantum objects can be apparently present at two places at a time; similarly, the quantum brain can hold onto two mutually exclusive ideas at the same time [17].

### ***1.11 Science of Meditation and Its Effect on the Human Body***

Now discussing about medication, studies show that medication can affect both physical and mental well-being of a person. The main purpose of doing medication is to know what is going on in one's mind. Medication can be useful in many ways, but side by side its harmful too. By taking medication, we get relief from pain,

depression, and anxiety. In ancient time many people die as we don't have any cure for it, but now we have medication for almost all the diseases that surround us. From cancer to simple cold, we have medication for everything; from headache to stomachache, all can be cured. Consuming a lot of medicines can have many side effects; it may harm the antibodies, produce many hormones, and/or reduce fertility in both male and females. According to a research by Harvard, there have been a number of key areas like depression, anxiety, etc. where mindful meditation has shown benefits for the patients. Meditation has shown many benefits. Eight weeks of meditation can reduce aging. It can improve memory [18].

Our health has two aspects: physical and mental. When the body is fit physically, it doesn't mean he/she is fit mentally and emotionally. The highest level is spiritual level which is even far higher than soul. It means understanding the real self and the reason for your existence. All these can be achieved by performing meditation which can be said as an exercise for the better mind.

Different types of meditation practices followed are concentration, mindfulness, etc.

The benefits are the following:

- Lower blood pressure
- Less perspiration
- Less stress and anxiety
- Deeper relaxation
- Feeling of well-being [19]

Our mental health is as much important as the body. Meditation helps the mental health in following ways:

- Reduce stress
- Controls anxiety
- Promotes emotional health
- Enhances self-awareness
- Increases concentration
- Reduces memory loss due to aging
- Also reduces bad addictions
- Builds honesty and kindness
- Helps in quick healing
- Improves bad sleeping habits
- Improves blood pressure problems

### ***1.12 Science of Mantra and Its Effect on the Human Body***

Yajna means sacrifice, devotion, and offerings. It is the holy work that we do to make our god happy; we offer mantras, japs. It has been seen that in our scriptures, we are doing Yagya for welfare of humanity. Whenever we face a gigantic difficulty,

a solution is to make gods happy by doing Yagyas. Its effect is very positive on humanity. The chanting sound of Gayatri mantra and heat from the fire of Yajna is a powerful combination and produces some important effects. We chant the Sanskrit mantras while performing the Yagyas; these send vibrations which ensure proper functioning of our body parts. The cosmic energy associated with the Gayatri Mantra is of the sun. These mantras sooth our mind and calm us. Performing Yajna also helps in removal of insects and bacteria in our environment. The environment becomes light and pleasurable. Not only it makes us happy, but it provides positivity to people who participate in them [12, 13].

This is believed to be another gift of Indian sciences which is for the betterment of us.

In the course of doing this holy Yajna, the two main energies, heat and sound, are released. This, along with the sound of the mantras such as Gayatri Mantra or other Vedic mantras, helps to achieve what we are wishing for. This is mainly done to get some physical, psychological, or spiritual benefits [20].

Yajna literally means devotion, worship, and offering. It is a process of cleaning oneself by invoking fire.

### ***1.13 Science of Yajna (Yajna) and Its Effect on the Human Body***

Yajna is a type of Holy Fire Ritual performed by Hindus to destroy the demons (the Asuras).

It is a ritual followed since the Vedic times with fact that it destroys negative energy.

The heat and sound are two basic types of energies.

In performing Yajna, these two energies, namely, the heat from Yajna fire and the sound of the chanting of the Gayatri and other Vedic Mantras, are blended together to achieve the desired physical, psychological, and spiritual benefits [21].

The science behind using Ghee in Yajna is that Ghee helps in combustion of wood and keeping fire on. So, it is an important reason to recommend to perform rituals of Yajna in sunlight.

This reason is taken from (<https://www.speakingtree.in/allslides/scientific-aspects-of-yajna-the-holy-fire-ritual>).

### ***1.14 Artificial Intelligence for Health Informatics***

In modern world, which is full of new fresh ideas which are capable of generating innovative technology which has a potential to surprise everyone in this world? This modernization we can see in our medical sciences. Healthcare organizations have

adopted new development. Today, machines can act, sense, and behave similar to the brain of the human being which is made possible only because of artificial technologies.

Due to AI, our medical system handles large set of data sets (information overload issue faced by health official is solved), solve complex problems using its analytical skills, and also able to handle administrative functions.

AI is able to handle large data and work efficiently because of machine learning technology which acts as its backbone [33].

### ***1.15 Health Sensor Data Management***

With its regular increase in market size, smart devices such as smart watch, smartphone, fit-bit like devices have created its popularity and unique identity.

With their useful features and extra ordinary applications of sensor based gadgets, people love to use these products so that they can keep an eye on data of patients without affecting their personal lives in a convenient way. Smartphone contains many embedded sensors such as microphones, cameras, gyroscopes, accelerometers, compasses, proximity sensors, GPS, and ambient light. Easily wearable and tear-off medical sensors can easily connect with the smartphones and transfer the sensing results directly. This helps a lot in maintaining blood pressure and calories in the body using fit-bit-type smart device.

Newly arising technology like artificial intelligence, internet of things, and data analytics gives an edge in easy and fast approach of data collection and performs certain action on it [22].

### ***1.16 Multimodal Data Fusion for Healthcare***

Data Classification is one of the most important area of work for understanding the features and conditions of different objects and data mining is a popular tool regarding this. The medical and healthcare sector handles big data which is available in unstructured form and it generates many difficulties like complexity of characteristics, functional diversity and redundant informations. These problems generated by multimodal unstructured data cannot be directly utilized by traditional machine learning methods. Therefore, some researchers have tried to implement multimodal data fusion using deep learning techniques [23].

Multimodal data fusion-based data processing method has high flexibility. This data processing method has a potential to work upon traditional data processing methods and respond to dynamic data. This method is able to reduce the load of data calculation by combining different fusion methods, but it requires significant effort to fuse data in the right way.



### ***1.17 Heterogeneous Data Fusion and Context-Aware Systems for the Internet of Things Health***

The number of internet-connected devices present in our day-to-day life is currently increasing in an exponential way. We use these devices at every place like home, workplace, etc. Even people like to interact with each other using these embedded devices [24].

A quite high number of researches are done on data fusion process using complex algorithms. In this, data is acquired and processed from heterogeneous sources and always centralized on a powerful computing node. We have a method which is based on lightweight service composition model to implement a distributed data fusion acquisition, which is able to ensure the correctness of collaborations without a cyclic behavior. Due to this method, we can work on decentralized and distributed manner and allow developers to use the concept of service and the interaction among services to design the high level of abstraction in IoT scenario [25].

The distributed approach for data fusion makes the service model very scalable and a really important aspect in the development of future applications, which can be deployed in embedded devices.

## **2 Literature Survey**

**Paper-1** Starting with some analysis, what we did was, we compared 61 healthy-state people with 256 patient people who had bronchial asthma. The study of the so-called bioelectrograms of those patients had been studied for the same. A widely used technique gas discharge visualization, i.e., GDV, had been employed for all the analysis. It is a type of bioelectrograph technique. Let's have a brief discussion on this technique as how this originated and from where. The GDV-gram taken from the fingertips of the hands of the person being the victim and the method of same is given further.

The main instrument and technology used hereby the team of authors is GDV camera and GDV processor which helps in maintenance of GDI processing and records. The main factors that we have taken into account was organization of data; other than this, the focus was on factors which interfered with our analysis. The main condition was to do registration of subjects to be done on GDV camera to see the Kirlian effects. Also, the mandatory coefficients like integral area, form, and emission are also required as methods of the GDV-gram being taken. Moving further, before giving out the conclusion and result of analysis, an experimental data has been studied. Its application is mentioned herewith.

As mentioned and reported before, GDV-gram of fingertips of both hands are taken separately to be able to differentiate the value of indices of both hands. Then, basically, the average is taken as a final observation. Both fingers' study taken as an

individual study is thus obtained by us. Now, moving more further, based on the obtained value, the final evaluation of result is thus done, and the final lines are obtained as a conclusion.

While expanding the discussion a little for clear understanding, GDV (Gas Discharge Visualization) has been accepted and it is a type of bio electro graph technique.

All the data and info is collected in a group of three people, the elaborated types of the three are as follows. First type consisted healthy people, the second including BA victim, and the last one included ulcer and stomach patients. This was done basically to study the results more widely and clearly differentiate them. The main parameters we focused on was on the coefficients like farcicality (FC) , emission (EC), and the integral area as already being mentioned above. Using the calculated values, the results are drawn.

This was just an upgrade of the previous derived techniques, now also known as gas discharge (GDV) bioelectrograph. In this one we added a more wider medical practice, beyond the previous one. Now, it is capable of monitoring clinical trials by clinical acumen and diagnostics. It was thus able to upgrade the previously used practices and tools. Formally, the collection and monitoring of multi-morbid patients can be now more organized with the help of the impact created by medications in comparison with the properties related to energy information. This also made selecting the right therapy simpler and accurate.

For our second-category people comprised of BA victims, this technique can be more widely employed. The biological functions of their body are made more in the course of the treatment process. This can also help in other ways too. Let's talk about them. The indications which are more relevant for medicinal as well as non-medicinal mergers of treatment are drawn now from the GDV-gram.

There can be one disadvantage here in this process. The patients with acute myocardial infarction is not accurate and not allowed as well as it can have side effects on them.

Now conning on the main section of the literature survey, the conclusions are ready to be mentioned. The patterns obtained from those samples of the GDV-gram can be simply and accurately related now with all three different groups of people. The main correlation was obtained by the BE technology with all collected pathogenic information. The result can be categorized into two sections. First, the traditional medical solution and homeopathy which is a collection of strategies, some of which are optional. We are now introduced to a newer technology, GDV-BE, which can study different medicinal solutions and problems such as diseases and infections and allergies by fluid commonly called as auras in vitro which is clearly biological. Also, the more elaborated organism can be studied in the similar way by simple comparison. At last, this can be more used in the fields of sports, business, professions, and other well-known works.

**Paper-2** In these series of analysis and studies, the contributors have categorized the conditions into three subsets. First one is orthostatic test followed by deep

breathing, second is 10 minutes of serious exercise, and the last one is intake of chocolate, being the most important as it is performed to reduce stress and fear.

Different correlations can be observed in these tests such as the correlation of the sympathetic component of HRV and GDV. As a result of these, the GDV measures can be used as well-being in different physiological conditions.

These physiological conditions are affected by different negative thoughts and emotions such as anger and fear, whereas the positive thoughts will leave a positive and productive effect on the body. This investigation examines as if such correlation between HRV and GDV can measure a well-being. All the cardiovascular activities are regulated by the nervous system; hence, the activities of both branches of the nervous system can be observed or judged by the heart rate variability (HRV) [3].

The methodology used in this paper is the amplifier with time constant (T) = 2.5 and (T) = 10 s. The rheostat and a variable capacitance are connected in parallel in the Wein bridge.

A sinusoidal wave of 1000 cps is used as an alternating current in the process.

For observing galvanization effect, DC is used [31].

Instruments and Data set used were related to traditional electrocardiogram which was equipped with four electrodes which as connected to left and right hands and left and right ankles to measure the HRV (Heart Rate Variability). GDV Compact Device and GDV Processor Software were used for the analysis of those images.

In supine position, the patient was asked to take a deep breath. This was done for a time period of 5 minutes. Also, the subject was asked to resume regular tidal breathing. Then after that, the readings were obtained. Before the GDV and HRV parameters are calculated, a 10-minute exercise was involved. Then, the third condition involved consumption of dark chocolate 3 hours after GDV and HRV parameters were measured [3].

### **Application of Work**

**Impedance change during response:** On comparing the obtained GRS's, the impedance is observed to vary gradually with lapse of time.

**The effect of removal of the epidermis:** Two records (lower and upper) are recorded using small and large electrode, respectively. It is performed on the left little finger and right little finger [31].

A comparison of endosomatic and exosomatic method is made, and the changes in the wave form are observed using small electrodes.

Impedance change observed by negative process and sweat gland activities is judged by positive process.

The impedance change is independent of secretory activities. The response always followed a monophasic fashion [31].

**Paper-3** In the absence of the epidermis, the galvanic skin reflex can be observed. It can be recorded by impedance change in the presence of current flow. Two processes called as negative and positive can be observed simultaneously using this. Two parts of the body are in connection using a galvanometer in Tarchanoff's galvanic skin response.

Tarchanoff also suggested the involvement of a sweat gland in this reflex. The indication of physiological event is confirmed using the abovementioned methods. It will also help to clarify the quantitative treatment of this galvanic skin reflex [31].

Gas discharge visualization (GSV) and heart rate variability (HRV) are mainly two methods used. The two were used as follows:

- GSV – Image analysis, registering both static and dynamic GDV images, and all the GDV parameters are described using this method.
- HRV – Using R-R time interval variability, the parameters are measured, and peaks in the very-low-frequency range are revealed by the spectral analysis of those time domain parameters [3].

Instruments and data set used: (A) Wein bridge is used as an instrument in the above process. (B) Variable resistance and capacitance are connected to form a parallel circuit. (C) GSR is used to check the balancing of the bridge. (D) The endosomatic and exosomatic methods are used for comparing the GRS [31].

Application of work is that, as discussed above, the cardiovascular activities are centrally controlled by our nervous system; it involves fluctuations in HRV. Hence, these fluctuations provide us a tool to measure the relativeness of both its branches. Also, the correlation between spectral analysis and fetal well-being is allowed by high sensitivity to hypoxia [3].

Future scope and limitations of this paper state that mostly positive deflection is observed in the removal of the epidermis. The negative one can be recorded after a slight regeneration of the same. The positive deflection was less observed with small electrode.

Conclusions of this paper says that the main purpose to establish the correlation was successful. Using those parameters of GDV and HRV, the main conclusions drawn are as follows:

- The study clearly observes a statistical correlation exists between brightness parameters of GDV and HRV (VLF component).

The range of frequency (VLF) is seen as 0.003–0.04 Hz, whereas the upper region can be seen as 0.01–0.04 Hz [3]. Therefore, on seeing the correlation, it can be concluded that “well-being can be measured as resilience to psychophysical stimuli.”

### 3 The Methodology and Protocols Followed

The methodology which was followed during this experiment were based on capturing photos by Kirlian camera. The volunteers had to chant and meditate for 15 minutes daily. Then they also had to perform Yagya. This turned out to be very beneficial for cancer patients. Even the European platform of Cancer and European Organization for Research and Treatment of Cancer supported this research work. It also shows a positive growth toward people’s happiness index and quality of life.