Research into the efficacy of the Gas Discharge Visualisation technique as a measure of physical and mental health

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Abstract

On the basis of our research, the GDV does not seem to possess any specific medical diagnostic capability. It does identify individuals who are ill more frequently than expected by chance and it relates to some traditional physiological measures of health, but some seriously ill individuals revealed normal GDV images. The GDV does display very significant change with interventions designed to reduce stress, yet the image does not correspond with how stressed an individual feels according to self-report. One explanation that is congruent with our findings, and those of many others, is that the GDV image reflects the body’s general response to disease, injury, malfunction or pressure. If this thesis is true, then the GDV is potentially a valuable instrument for it may inform us how an individual is coping physically with disease, injury or the pressures of life. However, all we have done here is put forward a thesis congruent with the facts as we see them, there is little proof beyond this. Such an explanation will gain greater weight when it is understood more precisely how the reaction of the body to illness or pressure affects the nature of the GDV image.

Introduction

The Gas Discharge Visualisation Technique (GDV) was developed by Konstantin Korotkov at St Petersburg State Technical University during the 1990s (see Korotkov 1998). In essence, a high intensity electric field is created around an object which produces a gas discharge. As this discharge is accompanied by photon emission it can be photographed and analysed using appropriate computer software. All objects, both animate and inanimate, when placed in a high tension electric field create a gas discharge the pattern of which is influenced by their properties. In the 1880’s, Nicola Tesla a Czech physicist working the US found that luminous discharges appear around the body when it is exposed to high frequency electromagnetic field. Since the 1940’s Kirlian photographs also produced by exposure to an electric field have revealed a human “aura”. The existence of the phenomenon is not in question, however, it’s explanation and interpretation is.

The basic physics of the GDV image is fairly straightforward and well-documented (for example, see Nasser 1971). The aura results from the movement of electrons and the ionisation of molecules in the gas around the skin. Assuming that the finger has positive potential the electrons will move across the dielectric plate towards the finger and will be absorbed by it. As they move they collide with the gas molecules wrenching out another electron and ionising the molecules. Thus each collision will result in an ion, two electrons and light emission. The consequence is branching tree like patterns orientated around the finger. When the finger has negative potential then electron movement will be away from the finger but as they are moving from the core to the periphery the effect will
be less marked. With an alternating current of about 1000 cycles per second patterns of electron movement towards and away from finger will be overlaid upon each other as portrayed by Figure 1.

With the high intensity electric field and other physical conditions held constant, variations in the resulting image are likely to be primarily influenced by the nature of the gas around the finger, and the conductance properties of the skin and body. We can identify three alternative, but not mutually exclusive, explanations of why the vapour around the finger and conductance of the skin and body may vary: the biological, the biophysical and the metaphysical.

Figure 1: Impact of alternating current upon gas discharge

![Figure 1](image.png)

The biological approach views the GDV image as a result of a local reaction to an electric field, e.g. the ionisation of water molecules or salts on the skin, or a reaction to the iron in the blood. Thus the change observed in an individual’s image over time and the differences observed between individuals, are considered likely due to differences within and between people in the properties of their skin, body tissues and plasma. Such change can be linked to differences in metabolism which arise because of differences in organ functioning, diet, hormones, body rhythms, autonomic nervous system, or psycho-emotional states. Thus, the GDV image can be reasoned to reflect in a general manner both body functioning and mental states.

The biophysical approach uses our developing knowledge of body physics to provide an explanation. Korotkov (1998) states that the human organism also has a complex electromagnetic field “which varies in response to the slightest changes in physiological condition”. The GDV image is influenced by this field because “under the high frequencies that are generated by sharp pulses the nature of the discharge is influenced by the properties not only of the local area of the skin by the electrode, but of the whole body as well”(p45). Thus a key distinction of the biophysical from the biological approach is that the images are not just the product of a local or general body reaction but reflect the whole body’s energy field. “The physical aura of the biological object and man in particular is the total combination of the physical fields and radiations, formed by a body in space both due to its own emission and interaction with the processes in the environment”(p30).

The meta-physical approach has its basis in Eastern philosophy. The aura reflects a spiritual energy or universal life force. Chakras or body energy centres and meridians form part of this energy system. Thus, stress management techniques such as acupuncture, meditation, yoga, and tai-chi are reasoned to affect this energy field by
unblocking energy meridians and reducing energy leakage to bring about a balance in body energy. The approach tends to be more holistic than traditional Western doctrine with mind and body seen as part of the same system. Consequently, a strong and balanced body energy field represents both a healthy physical and mental state.

**The GDV Technique**

The GDV technique involves an individual placing each of their fingers one at a time onto a dielectric plate. The finger is subject to a high intensity electric field (10Kv, 1024Hz, 0.5 sec) which results in a gas discharge and the accompanying photon emission is captured by an image grabber.

Thus, the most basic output from the GDV technique (i.e., the one that makes fewest assumptions) is a set of ten photographic finger images. Experience suggests that these range from very weak fragmented images to complete “circles of fire” as the figure below demonstrates. Furthermore, at any one moment in time, there tends to be a similarity between the type of finger image an individual reveals. Thus most of the finger images of either hand will be similar in kind.

**Variation in GDV Images**

![Variation in GDV Images](image-url)
In addition to the finger images, the GDV programme provides two further types of output. First, the computer analysis calculates various image parameters, such as the image area, brightness, and fragmentation. Second, an image of the whole body aura is constructed from the images of the fingers. Korotkov states “...the whole body of a person can be seen as projected onto one finger... consider the body as being organised on fractal principles... these ideas suggest that the energy system of the body displays holographic properties... it is becoming recognised, that at some deep level, not only the body, but the whole universe has a fundamentally holographic structure. If this is true, ... it means that the finger images can be a sufficient indication of the energy condition of the whole body”(p75). Korotkov uses the Su Jok system of acupuncture developed by Park (1993) to construct the body aura. The Su Jok system relates various sectors of the fingers to different body systems. For example, the top of the thumb relates to the head, the left side of the middle finger to blood circulation and heart, the bottom part of the little finger to the respiratory system, and so on. This reconstruction from the sectors of the finger image also forms the basis for medical diagnosis in the form of a beogram. Excess or deficiency of the image in various sectors is considered to be indicative of imbalance in the corresponding body systems.

A. Research into the GDV and Physical Health

The GDV claims to be able to diagnose pathology. If true, this represents an advance of enormous importance. Our first investigation concerns this claim. Is there any evidence that the GDV can accurately diagnose medical illness?

The investigation was undertaken in a private clinic in the Ukraine (our thanks to Dr. Semenikin). Thirty-two out-patients suffering from a variety of serious and well documented illnesses, were administered the GDV by an experienced and trained local practitioner. In addition, they had their systolic and diastolic blood pressure, pulse rate, skin temperature and skin conductance measured by a nurse. The medical files of the out-patients were reviewed by a GP in order to ascertain the nature of their illness. These assessments were undertaken independently and patients allocated numbers by the researcher so that the GDV administrator, the GP, and nurse could not collude. The interpretation of the GDV images and the analysis of the results were also undertaken independently by the two authors in London. A control group of 10 healthy individuals was mixed into the sample and they followed the same procedure.

Results

Our first analysis investigated the degree of agreement, in terms of specific diagnosis, between the medical profession and “blind” interpretation of the GDV images. Out of 42 cases, the GDV correctly diagnosed the illness or health in 22 instances and miss-diagnosed in 20 cases. The results are no better than expected by chance (z = -0.154, p=.44) and we conclude that there is no evidence that the GDV technique can identify specific medical illness.
It is important to note that the majority of subjects were on medication and this may have served to invalidate the sector analysis, never-the-less our results seriously question the use of the GDV technique as a diagnostic medical device, and challenge the validity of the Su Jok system in clinical conditions.

There is a less strict test, namely, can the GDV identify general ill-health or health rather than diagnose specific illness. Here the results are more encouraging. In 29 cases the GDV correctly identified that the individual was ill or healthy, and there were 13 “misses”. These results are significantly better than would be expected by chance ($z = -2.31, p = .01$) and we can conclude that there is some evidence that the GDV can identify general health. However, it is important to note that there were 11 instances where a seriously ill individual had a normal GDV image as interpreted by a trained practitioner. Thus whilst a weak or abnormal GDV image does seem to be associated in a general way with ill-health, a normal image is not a guarantee of health. This could be because to some degree the body adjusts itself to some medical illnesses over a period of time, or our findings may once again have been undermined by medication. Regardless of whether or not this is true, our results suggest that care is needed in drawing conclusions about an apparently healthy image.

Our earlier work had indicated that of the parameters produced by the GDV computer analysis programme that the measure of the image area was apparently a reliable and, as it revealed wide variation between people, a potentially useful parameter. We were interested to know whether this parameter was related to any of the more traditional medical measures. In terms of the physiological correlates of the GDV image area, two measures revealed statistically significant relationships, namely, the temperature of the skin ($r = -0.41, p < .007$), and heart rate ($r = -0.36, p < .02$). That is, as skin temperature and heart rate increased the GDV image became smaller ($R = -0.51, p < .003$). None of the other physiological measures revealed statistically significant relationships with GDV image area (skin conductance, $r = 0.30, p< .06$, almost achieved significance). The reasonably strong association between the GDV and skin temperature and heart rate does support the conclusion that the GDV is measuring some metabolic or biophysical condition and may therefore prove to be a valuable indicator of general health. Of relevance is the recent work by Korotkov (1999) who finds that there is a link between the GDV parameters and the physical fitness and mental preparedness of top Olympic athletes. Also of relevance is the work by Alexandrova and colleagues at St Petersburg State Medical University into the GDV and bronchial asthma and chronic obstructive disease of the lungs (see, for example, Alexandrova et al 1998). However, it is important to note that whilst this work reveals a relationship between the GDV and ill-health and provides some evidence of being able to distinguish between chronic and acute states, it does not claim to be able to diagnose respiratory disease a priori using the GDV.
B. Research into the GDV and Mental Health

Given the interconnectedness of mind and body, it is not surprising that a number of authors have claimed that the GDV reflects mental as well as physical health. Given the well documented metabolic changes that accompany mental stress, this looks to be a potentially fruitful area of investigation. Accordingly, we have undertaken a series of investigations into the impact of various stress therapies upon self-reported stress levels and GDV images. The basic research design for all the studies was to measure self-reported stress and the GDV image area before and then again after the intervention.

The Nature of Interventions & Samples

We have studied a wide range of interventions each led by an experienced tutor. T’ai Chi involves relaxing exercises based upon gentle circular and rhythmic movements. The T’ai Chi sample included ten stressed office workers, and five HIV patients. These two groups have been analysed separately. Kundalini Yoga involves demanding physical exercises mental concentration and spiritual discipline. The Yoga sample comprised fifteen self-selected individuals. Meditation was undertaken with six self-selected individuals using this mental self-regulatory technique which aims to take practitioners beyond the usual state of wakefulness to a state of profound rest coupled with a new state of awareness. Healing concerns the channelling of the universal life-force to restore energy balance within the body. A Tibetan lama used mantras and Tibetan rituals to channel healing energy with nine individuals. Mantras are Sanskrit words which have no denotative meaning and which are therefore free of distracting associations. Attention is focused on them as sound patterns which are believed to produce soothing and harmonious vibrations in the mind. Compared to meditation, which is a self-regulative exercise, healing is a passive process where the person is given treatment often without understanding its nature The Progressive Muscle Relaxation technique where the individual systematically tenses and then relaxes the body muscles was undertaken with nine self-selected stressed individuals. Whilst a further ten self-selected office workers attended a typical Stress Management Training course which involved a variety of stress reducing techniques such as, visualisation, muscle relaxation, breathing control and aerobics. Nine individuals attending The Stress Project in Islington (our thanks are due to Eoin Keogh and staff who provided a number of groups for our research) underwent Acupuncture which aims to unblock body energy though intervention in energy meridians with fine needles. The Unwinding group of nine individuals differed from the other interventions in that they chose their usual day-to-day method of relaxation. They chose in more or less equal measure, smoking, drinking or meditation. Finally the “Control” group was a group of fifteen self-selected post-graduate students at City University who volunteered to have their GDV image taken before and after a three hour lecture in either Organisational Behaviour or Applied Psychometrics. Whilst such lectures aim to achieve a higher state of consciousness, there is no particular reason to believe that they will reduce stress!

Our total sample for this research therefore involved 82 reportedly stressed individuals distributed between 8 different types of intervention, and a “control” group of 15.
Results

Our first interest was in the relationship between the self-reported stress rating and the GDV image area. Neither before nor after the interventions was there any significant relationship between image area and self-reported stress levels: an individual who reported that they were feeling highly stressed might have a weak or strong GDV image. We can conclude that GDV image area is not an indicator of self-reported stress levels. This conclusion is supported by similar findings from our Ukraine sample where the correlation between self-reported stress levels and GDV area was also found to be insignificant. If we distinguish between the concepts of pressure and stress, with the latter referring to the individual’s subjective experience, this finding is perhaps not so surprising. Depending upon their experiences of life and in part upon the nature of their personality, different individuals experience the same level of pressure differently. What will cause one individual to panic, another will experience as insignificant. Further, to some degree individuals do adapt to pressure. The story of the boiled frog is relevant here, especially as it does in part explain why “stress” is such a significant problem in modern life. If you pop a frog into a pan of boiling water it will immediately hop out. If however, you place it in cold water and gently heat it, the frog will croak away merrily until it expires. What is being suggested here is that the GDV may measure the pressure – mental and physical - that an individual is under, rather than what an individual subjectively experiences as stress. If it is, one would not expect much of an association between self-reports and the GDV image. But one would expect a more significant association between the relative change in stress levels over time and the GDV.

It is therefore interesting that when we investigated stress in a relative manner that is looked at the change in stress levels before and after the interventions, very significant findings emerged. Namely, that a reduction in self-reported stress was significantly associated with a strengthening of the GDV area (with those who started with a fairly strong image showing less improvement), and no change in reported stress levels before and after the intervention was associated with no change or a small weakening of the GDV image ($r = 0.57 \ p < .000$). We conclude that whilst you cannot tell whether or not an individual feels stressed from their GDV images, a felt reduction in stress is commonly associated with an increase in the GDV image area. This suggests that the GDV may indeed be measuring pressure rather subjectively experienced stress and potentially be able to indicate the relative efficacy of various stress reducing therapies.

This finding also emphasises the importance of investigating the GDV on a case by case basis. There is a danger that averaging results across individuals will conceal effectiveness. Consequently Table 1 is based upon a case by case analysis. The finger images of each individual have been compared before and after the intervention and subjected to a paired-sample t-test to test the statistical significance of the change.
The results show that the GDV image of most participants increased during the majority of the interventions designed to reduce stress. In many cases this was very visible and dramatic. [We were investigating the GDV not the effectiveness of the various treatments here and some are long-term interventions where one would not expect a radical change in a single session i.e., the table should not be used to judge the relative effectiveness of these treatments over the longer term]

The final stage in our analysis of the data involved an investigation to see whether there were any significant individual or finger differences in response to these various interventions. As the table above indicates, highly significant subject differences were found. That is, the same intervention affects different people differently. For example, meditation appears to have a positive benefit for the majority, but no effect or a negative impact for others. No significant finger differences were found. That is, regardless of whether the overall change in finger image area was positive or negative, the impact tended to affect all the fingers equally. Once again this points to a general metabolic or biophysical response, rather than a specific response where different fingers or finger sectors reflect different body systems.

**Conclusions**

What conclusions can we draw about the GDV technique? First, the GDV technique is potentially a valuable instrument. At any one time an individual does display a characteristic image, and different individuals do differ in the image they display. Second, the GDV image appears to reflect a general metabolic or biophysical state that is related to the more traditional physiological measures of skin temperature and heart rate. Third, the GDV image may provide an indication of general health but further research is required. A weak, fragmented image is associated with ill-health to a greater degree than would be expected by chance, but a number of ill individuals displayed a normal GDV image.

<table>
<thead>
<tr>
<th>Interventions</th>
<th>% Cases with statistically* significant increase in GDV finger images</th>
<th>% Cases with no change in GDV finger images</th>
<th>% Cases with statistically* significant decrease in GDV finger images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meditation</td>
<td>66%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>T'ai Chi</td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Unwinding</td>
<td>57%</td>
<td>43%</td>
<td>0%</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation</td>
<td>56%</td>
<td>44%</td>
<td>0%</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>56%</td>
<td>33%</td>
<td>11%</td>
</tr>
<tr>
<td>Stress Workshop</td>
<td>50%</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>T'ai Chi (HIV)</td>
<td>40%</td>
<td>60%</td>
<td>0%</td>
</tr>
<tr>
<td>Tibetan Healing</td>
<td>33%</td>
<td>56%</td>
<td>11%</td>
</tr>
<tr>
<td>Control Group</td>
<td>25%</td>
<td>62.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Kundalini Yoga</td>
<td>20%</td>
<td>53%</td>
<td>27%</td>
</tr>
</tbody>
</table>

*probability of the change occurring by chance is less than 5/100.
Fourth, whilst there is some evidence for a relationship between the GDV and general health, we have been unable to provide any evidence that the GDV can diagnose specific medical illness. It is true that the majority of our experimental subjects were on medication and that this may have served to undermine the GDVs diagnostic capability. Such a caveat could be given greater weight if it were known quite what causes the variation in GDV image and how different types of drug affected it. It is important to note that if medication does impact upon the GDVs diagnostic ability, the frequency of medicinal drug use in the general population will limit its practical usefulness for even common medicines such as aspirin affect body temperature. Regardless of whether or not our results have been affected by medication, as we know of no other empirical work that shows that the GDV can a priori diagnose specific illness, we conclude that the case for the diagnostic capability of the GDV remains unproven. Consequently, those who use the GDV to diagnose specific illness need to provide scientifically acceptable evidence that it can indeed do so, or face a charge of quackery.

Fifth, there is no relationship between GDV finger images and measures of self-reported stress. That is, one cannot reliably distinguish between a self-reported highly stressed or unstressed individual on the basis of their GDV image. However, it may be the case that the GDV is measuring the physical and mental pressure that the individual is under rather than that which is subjectively experienced as stress. The images do display marked and visible change with interventions designed to reduce pressure and thereby mental stress, and an increase in image area does seem to be related to reduced mental stress levels. If this is indeed the case then the GDV represents a significant advance, for as the story of the boiled frog illustrated individuals frequently do not recognise the pressure that they are under. And it can be this pressure rather than our subjective experience of it that leads to psychosomatic illness, irritability and depression, heart failure, and so on. For as GPs can testify, people frequently do not recognise that the physical and psychological symptoms they display result from their inability to cope adequately with the pressures of their lives. Sixth, the GDV does appear to be a potentially valuable tool for assessing the relative efficacy of various stress interventions. Further, one would not rule out the possibility that it could, like traditional measures of temperature, heart rate and blood pressure, also be valuable in tracking the effectiveness of medical treatment or physical fitness programmes.

Finally, two observations for future researchers. During the course of this research it has become clear that the GDV area parameter which we originally considered to be reliable, and upon which the body aura and beogram constructions are based, is occasionally subject to error. We had to remove perhaps five per cent of the area estimates from the analysis because the parameter calculation did not reflect the nature of the image. In most cases this was because light or some other factor had caused a “shadow” across the image which then was picked up by the analysis programme and included in its calculation of image area. Parameter estimates need to be checked against a visual copy of the finger image. Second, the absolute area or shape of the GDV image appear to be less informative than the relative change in the image over time. Furthermore, we have found highly significant subject differences ie., different subjects react differently to the same treatment. Pooling the results of different individuals may therefore obscure significant findings. Case by case analysis using difference measures would appear to be a more appropriate method of investigating the impact of various treatments upon the GDV.
References


