GAS DISCHARGE VISUALIZATION CHARACTERISTICS OF AN INDIAN DIABETES POPULATION

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Abstract

Instruments measuring subtle energy levels in human subjects are becoming increasingly popular in complementary medicine. Gas Discharge Visualization is an instrument measuring fingertip electron emission, variations in which correspond to changing health levels in different organs and organ systems. Its characteristics in diabetes have not previously been determined. The purpose of this study is to compare Gas Discharge Visualization parameters of diabetes patients those of healthy individuals. Data taken from 138 diabetes patients, divided into three groups according to duration of patholgy, was compared with data from 84 healthy subjects. Three GDV subscales were analysed: GDV Screening, Diagram, and Right Left Symmetry. Significant differences were observed between the two groups in the cardiovascular, endocrine, immune and urogenital systems. Dividing the diabetes group according pathology duration revealed systematic increases in values in all organs and organ systems. Also, our Bangalore based subjects seemed to have different norms from those originally used to calibrate the instrument. Differences between diabetic and healthy groups increase with increasing duration of the disease. Population norms require further investigation.

Keywords: *gas discharge, visualization characteristics, diabetes*

Diabetes and its complications have reached epidemic proportions (Bassett, 2005), but although biomedicine has evolved diabetes management strategies, it remains a chronic disease, for which no cure is available (Nyenwea, Jerkinsb, Umpierrezc, & Kitabchia, 2011). As a system of complementary medicine, Yoga has had success in treating diabetes (Nahas, 2009), possibly through its supposed affects on 'subtle levels' of the physiology, such as prana and related forms of subtle energy. Previous research on Yoga's effects on such phenomena has included studies of senior executives taking courses on Stress Management of Excessive Tension (SMET) (Kumari, Hankey, & Nagendra, 2013), which observed that executive stress has a permanent lowering effect on subtle energy levels (Meenakshy, Hankey, & Nagendra, 2013). Remedial Yoga life-style programs including yogasana, pranayama and traditional vocal components, seem to restore health levels to normal (Sharma, Hankey, Nagilla, Meenakshy, & Nagendra, 2014; Dey, Hankey, & Kumari, 2013). Well-documented clinical effects of yoga lifestyle programs (Sharma, et al., 2014) suggest that before attempting to explain the mechanics of how Yoga therapies improve diabetes, we should try to understand the subtle changes caused by the pathology. One accepted way to monitor such subtle phenomena is by Gas Discharge Visualization (GDV), which records visible glows caused by electric discharges from 48 reflexological regions on the fingertips using a Kirlian camera. Each fingertip is pressed against a glass electrode, and photographed glowing spots provide health information about the subject (Kostyuk, Cole, Meghanathan, Isokpehi, & Cohly, 2011). Physiological and psychological states are distinguished by use of a filter. Healthy readings only vary about 8-10% (Korotkov, 2011). 'GDV Screening' and 'GDV Diagram' are software-based diagnostic indicators which assess the fingertip photographs, representing the subject's health status by energy coefficient tables for different organs and organ systems respectively. Previous studies have reported on GDV's use to characterize some keypathologies including cancer, asthma, and autism (Yakovleva, & Korotkov, 2013). It seems a promising non-invasive tool for identifying characteristic signature patterns of pathologies, and thus for diagnosis of potential health disorders before pathology actually manifests (Korotkov, 2011). This study is the first to apply GDV to diabetes.

Materials and Methods:

The study is a comparison of GDV data from two groups of subjects, Diabetes and Normal.

Subjects

288 subjects consisting of a Diabetes group; 147 subjects, and Normal group; 141 subjects. After selecting the normal subjects with cut-off and removing outliers from both groups, total numbers of subjects in both groups were Diabetes: 138 and Normal: 84.

The Diabetes group then consisted of 138 T2DM patients (mean age±SD, 57.74±9.38), 76 male (mean age±SD, 59.28±10.79) and 62 female (mean age±SD, 56.02±8.88) who reported for treatment at a holistic health home near Bangalore, India, between March and September 2012. Mean length of diabetes history was 9.65±7.09 years, but for the purpose of analysis these were split into three subgroups according to duration of the pathology, Dia1 (x d" 5 yrs), Dia2 (5 < x d" 10 yrs) and Dia3 (x > 10 yrs) (Figure 1).

Normal group: It consisted of 84 subjects (mean age±SD, 56.67±9.38), 49 male (mean age±SD; 57.94±9.51) and 35 female (mean age±SD, 54.89±9.01) measured at institutional facilities in Bangalore, India, between February and September 2012. The Normal group's genders and age ranges were matched with that of the diabetes group.

Inclusion Criteria: Age range 31-80 years; willing to volunteer for the trial; for Diabetes group, T2DM according to FBS and/or PPBS (mostly both).

For the normal group, healthy individual without any acute or chronic illnesses.

Exclusion Criteria: Years of diabetes history unknown; physically handicapped; presence of other contagious or infectious disease; chronic disease; for females: pregnancy, or menstruation on the measurement day.

Sampling time: 11 am to 1pm and 4pm to 6 pm (to maintain consistency in time, and partly because GDV reading has been found to be stable at these times of day). Informed consent was obtained from all subjects.

Instrument: The KTI Company EPI/GDV Camera Pro instrument was used for the study, together with GDV software, such as GDV Screening, GDV Diagram, and Left-Right Hand Imbalance (Korotkov, 2011). Reading without filters was also made obtaining data about subject's sympathetic nervous systems and psychosomatic states.

Data Analysis: Excel and SPSS 20.0 were used. (Tests: Chi square to match groups' age/sex; Kolmogorov-Smirnov for normality; Kruskal Wallis and Mann Whitney for between group analyses, Friedman test analysis of rank order data for GDV screening and GDV diagram)

Results

Demographic: No difference in mean ages was found between the 138 diabetes and 84 normal subjects (Table 1).

GDV Screening: 'GDV Screening' analysis gives values for each of eight organ systems by summing contributions from various fingertip sectors relevant to each organ system (Table 2). Our analysis first estimated 'mean values' for the control group of 84 subjects. The analysis for the three diabetic groups showed increasing trends in mean values for each organ system as the period of diabetes increased from Dia1 to Dia2 to Dia3, the sole exception being for the Cardiovascular System from Dia1 to Dia3 (Table 2). Similarly all the Dia1 values were greater than the Normal values except for Immune system. Organ system ranking values in Table 2 are given in Table 3. For all eight organ systems taken together the ranking of GDV Screening values gave a completely clear ordering: Normal (9), Dia1 (16), Dia2 (25) and Dia3 (30) (Table 3, Sum). Friedman's rank test on Table 3 rankings gives $p<0.0001$. This justifies comparing individual column values. It also strongly suggests that each organ system tends to be driven further away from normal (i.e. 'out of balance') as the duration of the pathology increases, though more detailed analysis may be necessary to establish this rigorously.

Non-parametric tests were used, as columns were not normally distributed. The Kruskal-Wallis test gave good significance ($p < 0.001$) so Mann-Whitney U tests were performed between columns. These found significant differences between the Normal group and Diabetic groups in the following organ systems: endocrine, urogenital systems (all $p<0.01$), cardiovascular, digestive, nervous, and immune systems ($0.01<p<0.05$) (Table 2). The Normal group differed significantly from Dia2 in cardiovascular ($p<0.05$), endocrine ($p<0.05$), urogenital ($p<0.001$) and immune systems ($p<0.05$) and Dia3 in all variable except cardiovascular system. Dia1 did not differ significantly from the normal group, but differed from Dia2 for the immune system ($p<0.05$) and Dia3 for endocrine ($p<0.05$), locomotive ($p<0.05$), digestive ($p<0.01$), urogenital ($p<0.05$) and immune systems ($p<0.05$) (Table 2). Dia2 differed significantly from Dia3 in locomotive ($p<0.05$) and digestive system ($p<0.01$).

These results further establish the principle that for increasing duration of diabetes, GDV values are driven further and further away from population norms.

GDV Diagram: 17 out of 33 variables showed significant differences between diabetes and normal groups. The following 17 variables showed significant differences between normal and combined diabetic groups: Integral area; cardiovascular system; Immune system; and epiphysis ($p<0.01$); right eye; right ear, nose & maxillary sinus; Jaw & Teeth right side; left eye; coccyx & pelvis minor zone; liver; thorax & respiratory system; cerebral zone; urogenital system; thyroid gland; hypophysis; mammary glands; and coronary vessels; ($p<0.05$) (Table 4).

Table 5, presenting ranking orders in Table 4, shows those 13 variables are well ordered (Normal = 1, Dia1 = 2, Dia2 = 3, Dia3 = 4), and that for 9 variables only 1 swap from this 1-2-3-4 order was present e.g. 2-1-3-4 etc. The variables in each group were as follows:

Correct Order (0 swaps): Integral area, Right eye, Right ear, Nose & Maxillary sinus; Jaw & Teeth right side; Liver; Immune system; Thorax zone & Respiratory system; Nervous system; Adrenal; Pancreas; Thyroid gland; Mammary glands & Respiratory system.

One order change (1 swap): Left eye; Cerebral zone (cortex); Sacrum mean; Lumbar zone; Thorax zone; Cervical zone; Hypothalamus; and Urogenital system.

The other 11 variables were distributed as 8, two swaps, 2 three swaps and 1 four swaps, with none at five or the maximum of six swaps.

The general pattern of increasing departure from normal values with duration of diabetes thus seems to be the case in GDV diagram organ variables as well, the same as for GDV screening variables. Two thirds of the data for individual organs (13+9=22 out of 33 = 2/3) showed this all but perfectly, minor variations, probably being due to the data's statistical nature.

Left-right imbalance: Diabetes and Normal groups showed significant difference ($p=0.05$) for left-right imbalance at 4L-4R (between fourth fingers on left and right hands) being -0.062 ± 0.182 and -0.025 ± 0.12 respectively (Table 7), the Diabetes group having larger left right imbalance.

Discussion

GDV was normalized on a Russian population, and expresses 'imbalances' relative to that population. Tables 2 and 4 identify imbalances in organ systems and organs.

Some of these may be specific to population concerned, however, either to India or Bangalore. How specific they are to T2DM cannot be stated with certainty.

It is increasingly accepted that a prolonged state of insulin resistance and elevated blood glucose levels leads to various secondary pathologies (Fowler, 2008). Five years of diabetes, may lead to the well known complications, nephropathy and retinopathy etc. (Pedro, Ramon, Marc, Juan, & Isabel, 2010). These observations seem to correlate with our measurements: increasing diabetes duration leads to increases in energy values indicating increasing pathology for many GDV variables. It would be worth investigating GDV's ability to forecast onset of nephropathy or retinopathy for individual patients. For this further study is needed.

Overall results of our analysis therefore seem significant. They indicate how closely connected the healthy functioning of all the organs and organ systems is to whole system health. When one suffers, all suffer. Further research is needed to see if this conclusion generalizes to other pathologies, especially chronic diseases, and how well it obtains for individual patients, as opposed to groups.

Concerning the observed left-right imbalance in the 4th finger, where the following reflexological points are located: Pancreas, Adrenal, Urogenital system, Spleen, Hypothalamus, Pineal Gland, Pituitary gland, and endocrine system (Korotkov, 2011): all these organs are related to diabetes (Becker, Kahn, & Rebar, 2002). Fourth finger imbalances may reflect details of the pathology's behaviour. Further study of this is needed.

One interesting observation was that changes of variable values with years of T2DM seem to be greater than corresponding increases with age in the Normal group. This suggestion represents a hypothesis for further research. For that reason it will be a topic of future study rather than being an *ad hoc* secondary analysis.

It suggests that GDV can detect decreasing health levels with age, which are accelerated in T2DM patients compared to normals, possibly due to the stress caused by the pathology. Thus, GDV not only seems to detect changes in organs and organ systems characteristic of a primary pathology, but also secondary, or even tertiary, pathologies caused by it.

In normal practice of modern medicine, separate lab tests monitoring the course of complex pathology for every possible complication can become prohibitively costly (Herman, & Eastman, 1998). Our data suggests, however, that GDV offers a simple and cost-effective way to monitor all organs and organism subsystems at once. Lab tests would only be required to confirm indications showing up in GDV Screening and GDV Diagram data. This important possibility should be the subject of further research.

Conclusions

Gas Discharge Visualization data indicate patterns of imbalance in short and long term T2DM patients: Tables 2 and 4 show specific patterns of imbalance in organ systems and individual organs. Although these imbalances may seem unique to T2DM, how precisely this is true remains to be determined. The present level of data analysis tentatively identified patterns of imbalance specific to diabetes. Further research including more detailed data analysis is required on this matter. What was clear is that a steady increase in energy coefficients occurs with increasing duration of the disease, confirming steady degeneration of health.

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TABLES

Table 1 - Demographic Data of Normal and Diabetes Groups and Subgroups

Group (N)	Years Diabetes	Mean Age	Male / Mean Age	Female/Mean Age
Dia1 (45)	2.47±1.59	53.38±9.84	25 / 54.36±10.64	20 / 52.15±8.86
Dia2 (46)	8.04±1.41	57.09±9.59	21 / 57.19±9.89	25 / 57.00±9.49
Dia3 (47)	18.01±4.37	62.55±9.00**	30 / 64.83±9.17$	17 / 58.53±7.30
Total (138)	9.65±7.09	57.74±9.38	76 / 59.28±10.79	62 / 56.02±8.88
Normal (84)	NA	56.67±9.38**(0.004)	49 / 57.94±9.51$ (0.017)	35 / 54.89±9.01

**<0.01, $<0.05

Table 1 Caption: Table 1 shows distribution of age and gender data for the experimental and control groups and subgroups. There were no significant differences between the experimental group of 138 subjects and the normal group of 84 subjects.

Table 2 - GDV Screening Analysis

System Mean	Diabetes	Normal	Dia1	Dia2	Dia3
Cardiovasc.	0.061±0.19*	0.001±0.22^	0.062±0.14	0.089±0.12^	0.032±0.27
Respiratory	0.195±0.26	0.141±0.27$	0.156±0.3	0.179±0.25	0.249±0.23$
Endocrine	0.074±0.22**	-0.015±0.28$$,^	0.012±0.25#	0.095±0.19^	0.114±0.22$$,#
Locomotive	0.023±0.27	-0.05±0.34$	-0.019±0.28#	-0.006±0.25£	0.092±0.26$,#,£
Digestive	0.025±0.27*	-0.072±0.28$$$	-0.047±0.32##	0.005±0.2££	0.113±0.24$$$,##,££
Urogenital	0.096±0.31**	-0.042±0.40$$,^^	0.002±0.35#	0.116±0.32^^	0.165±0.27$$,#
Nervous	0.063±0.21	-0.006±0.26$	0.033±0.20	0.048±0.21	0.108±0.21$
Immune	-0.164±0.3*	-0.255±0.34$$,^	-0.263±0.32#,†	-0.139±0.26^,†	-0.094±0.3$$,#

*,$,^, #,†, £ < **0.05**; **,$$,^^, ##, ££ < **0.01**; $$$ < **0.001**

❖ Comparison between

- Normal and Diabetes combined: *
- Normal and Dia3: $
- Normal and Dia2: ^
- Dia1 and Dia3: #
- Dia1 and Dia2: †
- Dia2 and Dia3: £

Table 2 Caption: Table2 presents results of GDV Screening analysis for Diabetes and Control Groups and the three Diabetes subgroups for the eight organ subsystems. In all eight cases, the mean value of controls is lower than the mean value of the overall Diabetes group, for which the 1-Tailed Sign Test significance is p<0.0039. Those subgroups that reached statistical significance individually are printed in bold.

Table 3 - Rankings in Table 2

System Mean	Normal	Dia1	Dia2	Dia3
Cardiovasc.	1	3	4	2
Respiratory	1	2	3	4
Endocrine	1	2	3	4
Locomotive	1	2	3	4
Digestive	1	2	3	4
Urogenital	1	2	3	4
Nervous	1	2	3	4
Immune	2	1	3	4
Sum	9	16	25	30
Mean±SD	1.13±0.35	2.00±0.54	3.13±0.35	3.75±0.71

Table 3 Caption: Table 3 presents the sequence of rankings of Table 2 variables, shows that they are very highly ordered, and that collective trends of all variables are to increase with time. The ranking sequence 1-2-3-4 occurs 6 times, 2-1-3-4 and 1-2-4-3 only once. The probability p against this happening by chance is less than 0.001.

Table 4 - GDV Diagram Analysis

Variables	Diabetes	Normal	Dia1	Dia2	Dia3
Integral area	0.034±0.22**	-0.052±0.25$$	-0.009±0.24	0.033±0.18	0.077±0.22$$
RMS of Integral area	0.368±0.15	0.375±0.16	0.394±0.18	0.363±0.12	0.349±0.15
Integral entropy	1.854±0.14	1.889±0.14σ	1.822±0.15σ	1.857±0.13	1.882±0.12
Right eye	0.099±0.28*	-0.041±0.25$	0.051±0.27#	0.119±0.24	0.126±0.34$,#
Rt ear, Nose, Maxi. sinus	0.050±0.30*	-0.062±0.36$$	-0.010±0.32#	0.055±0.26	0.102±0.32$$,#
Jaw, Teeth right side	-0.003±0.45*	-0.143±0.502$$$	-0.089±0.56##	-0.054±0.49£	0.13±0.54$$$,##,£
Throat, Larynx, Trachea, Thyroid gland	0.241±0.48	0.218±0.44	0.224±0.48	0.175±0.52	0.323±0.42
Jaw, Teeth left side	-0.039±0.42	-0.031±0.42	-0.065±0.45	-0.098±0.43	0.045±0.36
Lt ear, Nose, Maxi. sinus	0.106±0.27	0.061±0.30$	0.134±0.21	0.038±0.29£	0.144±0.28$,£
Left eye	0.265±0.24*	0.194±0.26$$	0.247±0.21#	0.225±0.29	0.322±0.21$$,#
Cerebral zone (cortex)	0.159±0.25	0.13±0.21	0.145±0.17	0.182±0.14	0.149±0.36
Coccyx, Pelvis minor zone	0.309±0.38*	0.161±0.55$$	0.205±0.47##	0.296±0.34£	0.422±0.29$$,##,£
Sacrum mean	0.152±0.36	0.081±0.54	0.056±0.46#	0.134±0.31£	0.262±0.28#,£
Lumbar zone	-0.116±0.39	-0.172±0.41	-0.125±0.38	-0.15±0.4	-0.074±0.38
Thorax zone	-0.168±0.31	-0.232±0.34	-0.16±0.31	-0.196±0.27	-0.149±0.33
Cervical zone	-0.024±0.27	-0.086±0.31	-0.028±0.24	-0.045±0.27	0.000±0.31
Transverse colon	0.044±0.23	0.001±0.22	0.053±0.18	0.078±0.11	0.001±0.33
Cardiovascular system	0.108±0.25**	0.006±0.27^,σσ	0.120±0.24σσ	0.100±0.24^	0.104±0.26
Liver	0.102±0.49*	-0.027±0.51$$	-0.069±0.61##	0.110±0.43	0.257±0.36$$,##
Immune system	-0.118±0.33**	-0.255±0.39$$$	-0.183±0.34#	-0.147±0.35	-0.027±0.28$$$,#
Thorax zone, Resp. system	0.128±0.29*	0.069±0.25$,^	0.098±0.27	0.153±0.19^	0.132±0.37$
Cerebral zone (vessels)	0.057±0.26*	0.004±0.25^^	0.063±0.18	0.106±0.13^^	0.003±0.38

Variables	Diabetes	Normal	Dia1	Dia2	Dia3
Hypothalamus	0.124±0.24	0.066±0.28	0.099±0.26	0.143±0.2	0.13±0.26
Nervous system	-0.137±0.38	-0.173±0.45	-0.162±0.41	-0.13±0.38	-0.12±0.35
Spleen	-0.293±0.48	-0.31±0.50	-0.441±0.53††	-0.191±0.42†	-0.253±0.46
Uro-genital system	0.082±0.37*	-0.050±0.47$^{\$\$,\wedge\wedge}$	-0.077±0.43$^{\dagger\dagger,\#\#}$	0.138±0.35^^,††	0.181±0.27$^{\$\$,\#\#}$
Adrenal	0.121±0.41	0.018±0.48$^{\$}$	0.042±0.5	0.112±0.33$^{£}$	0.205±0.37$^{\$,£}$
Pancreas	0.03±0.36	-0.067±0.40$^{\$}$	-0.049±0.41	0.025±0.37	0.12±0.3$^{\$}$
Thyroid gland	-0.008±0.30*	-0.088±0.33$^{\$}$	-0.029±0.34	-0.007±0.24	0.009±0.31$^{\$}$
Hypophysis	0.063±0.31*	0.007±0.26$^{\$,\wedge}$	0.074±0.25	0.093±0.28^	0.022±0.4$^{\$}$
Epiphysis	0.096±0.25**	0.046±0.21$^{\$\$,\wedge}$	0.105±0.15	0.116±0.19^	0.069±0.37$^{\$\$}$
Mammary glands, Respiratory system	0.215±0.29*	0.137±0.32	0.145±0.37	0.204±0.28	0.293±0.19
Coronary vessels	0.035±0.22*	-0.022±0.22	0.050±0.15	0.05±0.15	0.006±0.32

*,$,^, #,†, £ < **0.05**; **,$^{\$\$}$,^^, ##, ££ < **0.01**; $^{\$\$\$}$ < **0.001**

❖ Comparison between

- Normal and Diabetes combined: *****
- Normal and Dia3: **$**
- Normal and Dia2: **^**
- Dia1 and Dia3: **#**
- Dia1 and Dia2: **†**
- Dia2 and Dia3: **£**

Table 4 Caption: Table 4 presents GDV Diagram data for individual organs, analogous to the organ system data of Table 2. Again the Diabetes group has larger values on average than the control group – 30 out of 33 for which a binomial test gives $p < 0.635 \times 10^{-6}$. 17 reached significance in 't' tests, but none of the 3 reversed. Again the result of the disease is to produce a general increase in the GDV Diagram values for different organs.

Table 5 - Rankings in Table 4

Variables	Normal	Dia1	Dia2	Dia3
Integral area	1	2	3	4
RMS of Integral area	3	4	2	1
Integral entropy	4	1	2	3
Right eye	1	2	3	4
Right ear, Nose, Maxillary sinus	1	2	3	4
Jaw, Teeth right side	1	2	3	4
Throat, Larynx, Trachea, Thy. glnd	2	3	1	4
Jaw, Teeth left side	3	2	1	4
Left ear, Nose, Maxillary sinus	2	3	1	4
Left eye	1	3	2	4
Cerebral zone (cortex)	1	2	4	3
Coccyx, Pelvis minor zone	1	2	3	4
Sacrum mean	2	1	3	4
Lumbar zone	1	3	2	4
Thorax zone	1	3	2	4
Cervical zone	1	3	2	4
Transverse colon	1	3	4	2
Cardiovascular system	1	4	2	3
Liver	1	2	3	4
Immune system	1	2	3	4
Thorax zone, Respiratory system	1	2	4	3
Cerebral zone (vessels)	2	3	4	1
Hypothalamus	1	2	4	3
Nervous system	1	2	3	4
Spleen	2	1	4	3
Urogenital system	2	1	3	4
Adrenal	1	2	3	4
Pancreas	1	2	3	4
Thyroid gland	1	2	3	4
Hypophysis	1	3	4	2
Epiphysis	1	3	4	2
Mammary glands, Resp system	1	2	3	4
Coronary vessels	1	3	4	2
Sum	46	77	95	112
Mean±SD	1.39±0.75	2.33±0.78	2.88±0.93	3.39±0.93

Table 5 Caption: Table 5 presents ranking order for values of individual organs in Table 4. 13 weere in perfect order and 9 only had one pair of adjacent ranks swapped round. 22 out of 33 (2/3) of the organs were therefore well ranked according to increasing duration of diabetes, and we can be certain that for these variables departure from normal definitely increases with time.

Table 6: Comparison of rank ordered data: Freidman test

	Dia1-Normal	Dia2-Normal	Dia3-Normal	Dia2-Dia1	Dia3-Dia1	Dia3-Dia2
Z	-3.734	-4.131	-4.703	-2.027	-3.447	-1.700
p	.000	.000	.000	.043	.001	.089

Table 6 Caption: Table 6 presents Z and p values for the various groups and subgroups in Table 5. It shows normal rank ordering well maintained between groups. The only pair not significantly different was Dia2-Dia3, which still showed a strong trend.

Table 7 - Left-Right Imbalances of Normal and Diabetes Groups
(Differences in Energy Emission between Left and Right Hands)

Variables	Normal	Diabetes
1R-1L	-0.057±0.198	-0.102±0.212
2R-2L	-0.027±0.174	-0.030±0.172
3R-3L	-0.050±0.181	-0.031±0.173
4R-4L	-0.025±0.120	-0.062±0.182*
5R-5L	-0.036±0.199	-0.046±0.173

*p = 0.05

Table 7 Caption: Table 7 presents the left-right imbalances between Normal and Diabetes group. Imbalances are more in Diabetes except for 3L-3R. 4L-4R showed a significant difference between groups.

FIGURES

Figure 1 - Flow chart – study design

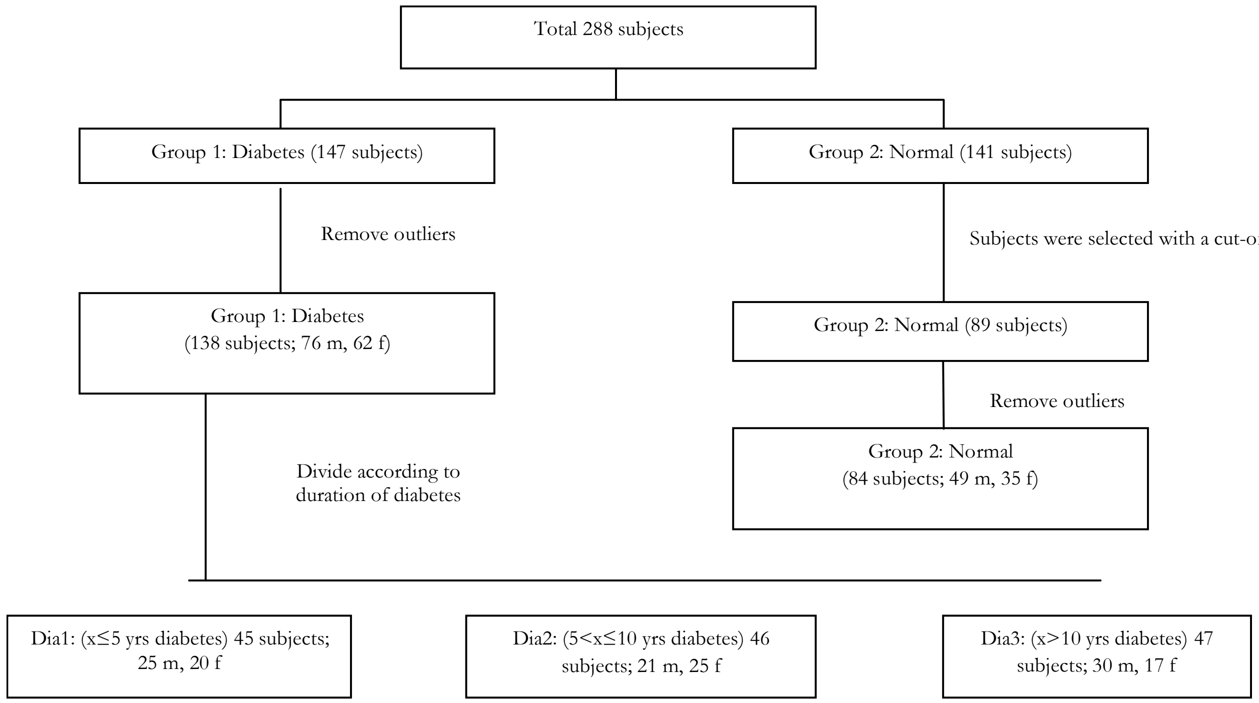

Figure 2 - **GDV Screening Comparison of Normal Group and Diabetes Subgroups**

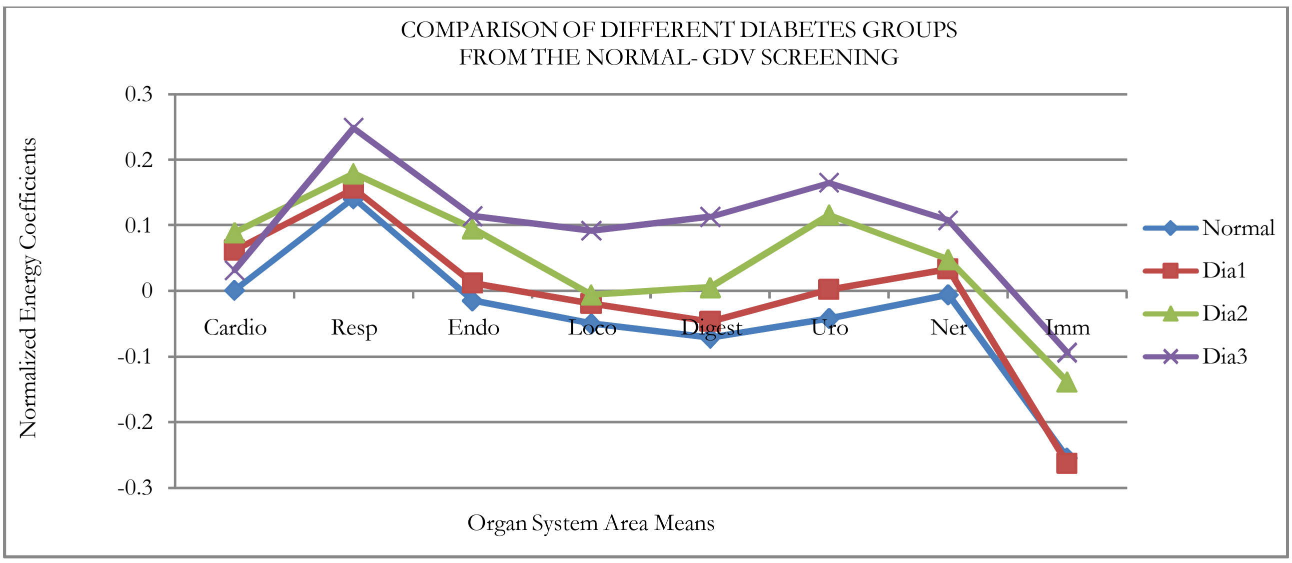

Figure 2 Caption: Figure 2 is a graphic representation of GDV screening analysis between Normal and Diabetes subgroups. Trends are apparent from Normal to Dia3 in increasing order for all organ systems, except the cardiovascular system. This points to increasing deviation from Normal with disease duration.