WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 8, Issue 7, 176-205. Research Article ISSN 2277– 7105

THE METHOD OF INDIVIDUAL ASSESSMENT OF THE ACTION OF INSULIN AND ITS ADEQUATE DOSE IN DIABETES MELLITUS

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Article Received on
01 April 2019,
Revised on 22 April 2019,
Accepted on 13 May 2019
DOI: 10.20959/wjpr20197-15076

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ABSTRACT

Background: One of the main drugs in the treatment of diabetes is insulin. However, the main problem with its use is to adequately selected dose, taking into account the individual characteristics of the organism. The existing methods of invasive control of the effectiveness of its use are quite burdensome for patients, do not always provide an adequate result and reflect the level of glycemia in an already accomplished fact. The purpose of this work was to study the effect of insulin on the level of activity of acupuncture channels (AC) using the Akabane test and their relationship to the glycemia level in type 1 and 2 diabetes mellitus. **Methods:** In the clinic of endocrinology, the Akabane test was performed in 141 patients with type 1 and 84 with type 2 diabetes who received fast and long-acting insulin. In addition to assessing the effect on channels of different doses of both types of insulin, the effects of time after injection, time after food, and level of glycemia are further analyzed. **Results:** A pronounced significant effect of this two groups insulin (short and long acting) on certain AC was determined depending on their dose and injection time. When comparing the effect of insulin with the effect on the AC level of glycemia, it was found that the insulin dose and level glycemia mainly affect the same channels, but with the opposite sign and side of influence. In this case, a properly selected insulin dose levels the presence of asymmetry between the left and right branches of the channel, characteristic of hyperglycemia, and creates harmony at the level of bioenergy. Thus, new theoretical and practical prerequisites for the control of an adequate dose of insulin and the selection of individual drugs based on new non-invasive physical principles appear. This rule applies to other medicinal substances. The patient can exercise such a simple non-invasive control of an adequate dose of insulin by the patient on their own.

KEYWORDS: Glycaemic control; insulin; acupuncture; Akabane test; symmetry and asymmetry in the body,

1. INTRODUCTION

Diabetes is one of the biggest health challenges facing the world that affects millions of people. The International Diabetes Federation (IDF) estimated that in 2017, approximately 425 million people in the 20–79-year age group worldwide (8.8% of the global population) had diabetes.[1] Therefore, even minor innovations relating to improving their condition deserve close attention. The clinical goal in the treatment of diabetes is to achieve good glycaemic control. Traditionally, glycaemic control is assessed by monitoring the levels of glucose, preferably several times a day and periodically level on glycated haemoglobin (HbA_{1c}), providing an average blood glucose (BG) reading from the previous 2–3 months.[2,3] However, all these techniques are invasive, which is burdensome for patients.

Despite active research in the field of adequate selection of insulin dose in diabetes mellitus, this problem is still the most urgent in diabetes. In this regard, studies have been conducted to study the effect of glycemia on the activity of certain acupuncture channels (AC), which revealed opportunities for monitoring diabetes on new physical principles.[8-11] At the same time, significant effects of insulin on AC were revealed.[5,6,8] These dependencies were the subject of this more in-depth study.

2. MATERIALS AND METHODS

Akabane tests were performed on 225 patients, including 120 women and 105 men with type 1 and type 2 diabetes (T1D and T2D) at different times after injecting various doses of insulin for short and long- actions, including in the dynamics of observation.

The diagnosis of diabetes was confirmed on the basis of standard examination methods in a specialised endocrinology hospital. The average age of the patients was 48.71 ± 14.2 years. Patients with polyneuropathy were excluded from the study. For each patient, the effect of a short and long-acting insulin dose on the AC was analyzed separately, as well as the total insulin dose per day, the time after each dose, and the time after meals before the Akabane test. In these patients, the association of AC with glucose from capillary and venous blood was also analyzed.

To quantitatively evaluate a acupuncture channel's activity level in Traditional Chinese Medicine (TCM), the so-called "sacrificial stick" test was used in ancient times in China. This test involved a burning sandal stick that was brought in proximity to points at the tips of every finger and toe until the first sensation of pain. At each point, the pulse rate before pain was first felt, was measured. If the number of pulse beats was lower than the average one for all the channels, it proved the hyperactivity of an acupuncture channel and its corresponding organ. Conversely, when the rate was higher, it represented the inactivity of a channel and its corresponding organ. This test was described by the Japanese doctor Koben Akabane in 1956.[4] Since then, the test has carried his name. From the point of view of modern physiology this test measures the pain thresholds in temperature sensitivity (TS) when heat is applied to the “entrance-exit” points of each channel (LU11, LII1, PC9, TE1, HT9, SI1, SP1, LR1, ST45, GB44, KI1, and BL67) by applying an impulse light-emitting diode (LED) non-coherent infrared radiation (IR)-light onto the skin ($f = 1$ Hz, $\lambda = 920$ nM), recording total energy consumption by the number of heat pulses.[5-7,15-17] Each impulse radiates 0.07 joules of thermal energy. To assess the overall changes in the bioenergy of the organism, 2 additional points GV26 and CV24 were also used.[6,17] TS is our bodies’ basic reactive system; it is as significant as important indicators such as body temperature, as it gives a very clear representation of functional and psycho-physiological profiles.[12]

According TCM and Our Study Results, The Following Channels Have Different Regulatory Functions:

- LU- Lungs Channel, connected with the function of lungs and tissue breathing.
- Li- Large intestine channel, connected with the large intestine function and its microbe flora, it participates in the regulation of arterial pressure, biochemical blood indices.
- PC - Pericardium Channel, connected with the cardiac muscle trophicity and its structure. In addition, it is connected to muscular activity, arterial blood pressure levels and emotions.
- TE- Triple Heater channel, connected to the central and peripheral hemodynamic, and regulates thyroid and hypophysis hormones in the body.

- HT - Heart Channel, regulates the cardiac rhythm, body's physical strength
- Si - Small intestine channel, connected to the electrolytic balance and food digestion.
- SP- Spleen-Pancreas channel is connected to the pancreas and immunity.
- LR- Liver Channel is connected to liver function and central nervous system, stress levels
- St- stomach channel is connected to the digestion function.
- GB- Channel of The Gallbladder is connected to the digestion function and peripheral nervous system.
- Ki- Kidney Channel is connected to the kidney function and the sympathoadrenal system.
- BL- Urinary Bladder Channel is connected to the urogenital system, its functions and its related hormones.

As follows from this short list, each AC can reflect various physiological and biochemical body indicators in addition to basic links with certain organs and physiological systems.

Each channel consists of the left (l) and the right (r) branch between which normal symmetrical activity balance is maintained.

All data are presented as mean ± standard error of the mean (SEM). The profiles of TS were compared using a *t* test for two independent samples and the Mann-Whitney U test. The analysis of the relations between AC was carried out using correlation (Pearson & Spearmen coefficients) and Factor analysis. One-way ANOVA by Scheffe post hoc tests analysed the effect of grouped glucose levels on AC data. To evaluate the dependence channels on glucose multiple regression analysis was used in men and in women. Statistical decisions were made at a significance level of 5% ($p \leq 0.05$). Data analysis was provided using the software package SPSS Inc. V 15 (SPSS Inc., Chicago, IL, USA).

3. RESULTS

The results of the regression analysis of the effect on the AC of a single dose of short and long -acting insulin in patients with type 1 and 2 diabetes and a total dose for 1 day in men and women are presented in Table 1.

Table 1: Regression models of dependencies of thresholds of temperature sensitivity of the AC on insulin dose in male and female with T1D and T2D.

Male T2D	**Short-acting insulin** R-sq = 63.05%, n-22			
AC	***Estimate***	***Error***	***t***	***p***
CONSTANT	4,74	2,31	2,04	0,0555
LRr	-2,28	0,46	-4,96	0,0001
GV	2,56	1,01	2,53	0,0206
SIr	2,09	1,11	1,98	0,0464
LIr	3.58	1.34	2.45	0.0230
Long-acting insulin R-sq = 90.4%, n= 1				
CONSTANT	9,84	9,35	1,05	0,3118
SPr	-12,16	3,13	-3,88	0,0019
LRr	-10,46	2,14	-4,87	0,0003
STr	6,90	1,68	4,09	0,0013
GBl	8,24	2,84	2,89	0,0126
CV	-14,50	3,69	-3,92	0,0017
GV	13,52	3,23	4,17	0,0011
Total insulin R-squared -61,81%, n-38				
CONSTANT	24,40	9,33	2,61	0,0135
LUl	-22,40	6,82	-3,28	0,0025
HTl	11,95	6,20	1,92	0,0628
LRr	-13,28	2,54	-5,21	0,0001
STr	6,21	2,11	2,93	0,0061
GV	22,24	4,78	4,64	0,0001
Female T2D	**Short-acting insulin** R-squared=61,77% n=25			
CONSTANT	2,74	0,97	2,81	0,01
SPr	-1,38	0,54	-2,54	0,02
SPl	0,95	0,51	1,77	0,09

Male T1D	Short-acting insulin R-squared = 51,63%, n=89			
AC	***Estimate***	***Error***	***t***	***p***
CONSTANT	8,04	0,82	9,78	0,0001
LUl	-0,98	0,43	-2,27	0,0256
PCl	1,89	0,54	3,47	0,0008
STl	-1,86	0,23	-7,87	0,0001
SPl	-0.82	0.36	-3.26	0.0003
Long-acting insulin R-sq = 29.8%, n=112				
CONSTANT	7,77	5,64	1,37	0,1714
LUr	6,19	2,42	2,55	0,0120
PCr	8,86	2,87	3,08	0,0026
STl	-6,69	1,40	-4,77	0,0001
BLl	-2,99	1,28	-2,33	0,0217
Total insulin R-sq = 16,17%, n= 142				
CONSTANT	15,94	3,31	4,80	0,0001
LUr	3,83	1,58	2,41	0,0169
LIr	-3,44	1,59	-2,16	0,0317
PCr	4,56	1,93	2,36	0,0189
STl	1,33	0,83	1,59	0,1114
GBl	-3,05	1,38	-2,21	0,0281
KIl	-3,31	1,27	-2,60	0,0098
BLl	-1,95	0,90	-2,15	0,0326
Female T1D	**Short-acting insulin** R-squared =33,24%, n=40			
CONSTANT	0,58	1,27	0,45	0,65
KIr	1,28	0,61	2,09	0,04
BLl	0,83	0,39	2,11	0,04

LRl	-1,09	0,50	-2,16	0,04
STl	0,73	0,34	2,11	0,04
Long-acting insulin R-squared=89,77%, n=24				
CONSTANT	0,66	1,02	0,64	0,5282
LIl	1,98	0,79	2,48	0,0253
TEr	2,43	0,93	2,61	0,0195
TEl	-12,25	1,32	-9,26	0,0001
SIl	6,04	1,17	5,12	0,0001
SPl	-1,48	0,31	-4,69	0,0003
LRr	1,00	0,29	3,42	0,0037
GBl	1,90	0,38	4,93	0,0002
BLl	1,05	0,37	2,77	0,0142
Total insulin R-squared = 30,13%, n=62				
CONSTANT	35,10	3,98	8,81	0,001
HTl	-8,81	2,84	-3,09	0,002
SPl	2,69	1,17	2,29	0,02
GBl	6,62	2,28	2,89	0,004
KIl	-5,98	2,34	-2,54	0,01
CV	-5,94	2,21	-2,68	0,008

Long-acting insulin R-squared = 48,3%, n=43				
TEr	4,71	2,30	2,04	0,04
TEl	-3,85	2,15	-1,78	0,08
GBr	4,70	2,41	1,94	0,05
KIl	-7,25	1,61	-4,48	0,0001
Total insulin R-squared = 12,50%, n=74				
CONSTANT	12,50	2,75	4,53	0,001
LIl	2,49	1,29	1,91	0,05
SPr	1,79	0,84	2,12	0,03
BLr	-2,24	0,74	-3,02	0,002
CV	4,09	1,48	2,76	0,006

Insulin Dose

Men with type 2 diabetes

The most pronounced effect of a **short-acting insulin** dose is noted on the LRr channel with a negative coefficient of interconnection (***p<0.001). This means that the higher the insulin dose, the lower the indices of the right canal of the liver, which corresponds to its stimulation and hyperactivity and a decrease in glycogen accumulation in the liver under the action of insulin. The unpaired channel (GV) is in the second place according to the degree of influence of insulin, through which, according to TCM, the flow of stored energy in the body enters the organs and systems where it is wasted. *At the same time, the term "channel energy" in TCM from the point of view of modern physiology should be understood as the functional activity of the organ or physiological system with which this AC is associated.* There is also a significant effect of insulin (*p<0.05) on the channels of the large intestine, which according to our data stimulates the production of endogenous insulin[6,9,10] and on the canal of the small intestine through which carbohydrates are absorbed. In all paired AC, only their right (Yin) branches entered the model, which accumulate energy from TCM, and the left branches of the channels (Yang), on the contrary, reflect the level of catabolic processes. Thus, the obtained influence model is rather logical from the point of view of modern ideas about the effect of insulin in T2D.

Long-acting insulin in the resulting model with a 90% explanation of the variance of the data has the same effect on LRr, (***p<0.001) in the same way as the dose of short-acting insulin. Further, insulin has the maximum effect on unpaired CV and GV channels with different signs of influence, which reflect the total accumulation and waste of energy in the body. In this case, in proportion to the insulin dose, GV values increase, as in the case of short-acting insulin. At the same time, the CV channel itself stimulates the production of energy in the body from various organs and systems. Of the other AC in the model, it should be noted a significant effect associated with stimulation of the pancreas and liver. The growth of indicators in the right channel of the stomach is also noted, which is adequate to the accumulation of its energy potential.

In many ways, a similar effect on the channels occurs in the linkage model with a **total insulin dose.** In this model, the greatest influence is also noted on LRr (***p<0.001) with the sign (-) and GV (***p<0.001) with the sign (+). The increase in GV reflects the increase in energy consumption in the body under the action of insulin. Among other features of the model, it is possible to note a stimulating effect on the lungs with a decrease in the level of hypoxia, as well as an increase in the body's physical endurance through the heart channel

It should be noted that these 3 models have some differences, because The pathogenesis of T2D varies greatly in different patients, as well as the effect on the body of different types of insulin on their individual response. Therefore, the task of evaluating these models is to find the overall global effects of insulin as a whole. The high values of correlation indices are explained by the small number of observations in this group of patients with type 2 diabetes, for whom insulin injections are usually an auxiliary method of treatment.

Women with type 2 diabetes

In women, the dose of **short-acting insulin** maximally affects the right branch of the pancreatic canal (SPr) with the + sign, which reflects the growth of its hypofunction with a decrease in the production of endogenous insulin.[6,9,10] In addition, there are significant effects on the left branches of the liver canal associated with its hyperactivity and on the right branch of the AC of the stomach, which is quite logical.

The long-acting insulin effect model has a high level of explained dispersion, confidence estimate of the data variance (R-squared = 89.77%). The highest connections are observed with both AC branches with different signs, and the effect on TEl (***p<0.001) is most pronounced. This AC is associated with thyroid function and central hemodynamic. Further, there is a significant relationship with AC- SIl (***p<0.001) - reflecting increased absorption of carbohydrates from the small intestine; GBl (***p<0.001) -connection with the nervous sympathetic system; -SPl (***p<0.001) - connection with the hyper production of the contra-insulin harmonic.[6,9] All these connections take place with the left branches of the channels, which reflect their Yang function associated with the increased activity of their organs and systems and the processes of catabolism enhancement.

However, it is necessary to take into account the sign of influence, which reflects an increase or decrease in the performance of a particular channel with an increase in insulin dose. The higher the value of the AC, the higher the hypofunction of the organ associated with this AC and vice versa, the low AC values reflect the hyperactivity. Thus, the final function of the organ by the AC is affected by 2 factors: the right or left side and the sign of influence, which may have an opposite or friendly vector of influence. The sign of influence (+ or-) is crucial, and the left or right side of influence explains the metabolic processes.

This dependence is especially clearly seen in the model of the effect of the **total dose of insulin,** where all paired channels are represented by left branches with the most pronounced connections in –HTl (**p<0.001); GBl (***p<0.001) ; CV (**p<0.001). In this model, HTl reflects the effect on muscular activity[6,12], GBl- influence on the activity of the sympathetic nervous system, the indicator KIl reflects hyperactivity of the kidneys, reduced energy accumulation in the kidney channel through reduced reserves of perirenal adipose tissue[12], CV- general communication energy from the all channels. This model is also quite logical and it has a generally similar ideology with a model for men, although there are significant features in both cases. These differences can be explained by gender effects[12], and the various effects of the main treatment for T2D in the form of various tablets of sugar-lowering drugs.

T1D men

In the treatment of T1D, insulin is the main drug, therefore its effect on the AC, unlike T2D, can be assessed here in its pure form, without additional external influences.

Short-acting insulin has the greatest impact on the left channel of the Stomach (***p<0.001), which reflects its pronounced stimulation, taking into account also the sign of influence (-). Thus, the higher the insulin dose is, the lower its TS, which corresponds to the hyperactivity of the channel and the stomach itself. The significant effect of insulin (***p<0.001) was also noted on muscle trophism through PCl, stimulation of the lungs through the left branch of the lung canal (-LUl). Separately, it should be noted paradoxical stimulating effect (***p<0.001) on the left branch of the pancreas canal (-SPl) associated with our data with the stimulation of A-cells and the growth of contrainsular harmon. This influence on this model is still difficult to explain and needs further study. One possible explanation is that such an effect is characteristic of those cases when the function of B- cells is completely absent. All connections in this model are also left-sided to Yang function of these organs, associated with their stimulation. As features in T1D, a significant effect (***p<0.001) of short insulin on the reduction of total thresholds of temperature pain sensitivity in all channels during the Akabane test should be noted. This effect can be explained apparently by a general stimulation of the nervous system.

Long –acting insulin in men has the most effect on the left branch of the stomach canal (***p<0.001), which increases the appetite. It affects the increase in trophism in the muscular system (+PCr), the growth of tissue oxygen saturation (+LUr), and also stimulates the hormonal sex through the left Yang bladder channel (-BLl), which increases the potency.[5,6,12]

In addition to the channels already mentioned, the **total dose of insulin** affects the production of endogenous insulin (-LIr), stimulates the nervous system (-GBl), and stimulates kidney function (-KIl).

Women T1D

Short–acting insulin has a significant effect on total energy storage (+ KIr) and the state of sex hormones (+ BLl). However, it should be borne in mind that, in women, the growth of this indicator in the norm is characterized by an increase in male sex hormones and the impossibility of conception.[6] This must be borne in mind when prescribing large doses of short-acting insulin in women of childbearing age.

Long-action insulin has the most significant effect (***$p<0.001$) on the kidney canal (-KIl), which is associated with hyperactivity of the kidneys, thyroid gland (TEr) and the neural system (GBr).

Total insulin most significantly (***$p<0.001$) affects sex hormones (-BLr), reducing its female component and reducing the conditions for conception. Through the channel +CV, it increases the total energy assimilation, as well as stimulates the production of endogenous insulin through the channels + SPr and + LIl.

Thus, under the influence of different types of insulin in the models obtained, in T1D as a whole, its highly significant effect on a number of channels and related physiological systems involved in the formation of key energy processes in the body is traced. Moreover, these effects are well explained in terms of the modern physiology of the organism.

Since the main task of correct treatment of diabetes is to maintain an optimal balance between the level of carbohydrates and sugar-lowering drugs, for example, insulin, then we can consider the scheme of their interaction in the form of a balance between two scales. We examined the effect of insulin on the channels, and now we will consider the connections of the channels with the glycemia level in these patients, analyzed from capillary blood and from a vein.

Table 2: Regression models of dependencies thresholds TS channels from the level of sugar in capillary blood in men and women with T1-T2D.

Male T2D R-squared = 19,59 %; n=38				
AC	***Estimate***	***Error***	***Statistic***	***P-Value***
CONSTANT	10,20	1,35	7,55	0,0001
SIr	2,42	0,92	2,63	0,0095
SIl	-4,95	1,12	-4,39	0,0010
STr	1,33	0,49	2,70	0,0076
KIr	-1,44	0,76	-1,88	0,0519
KIl	2,06	0,57	3,60	0,0004

Male T1D R-squared = 7,81%; n=67				
AC	***Estimate***	***Error***	***Statistic***	***P***
CONSTANT	11,37	1,31	8,65	0,0001
SIr	2,17	0,91	2,37	0,0183
SIl	-2,54	0,99	-2,55	0,0115
GBr	-1,06	0,52	-2,01	0,0452
GBl	1,06	0,52	2,03	0,0431
BLr	0,77	0,50	1,51	0,1307
BLl	-1,03	0,50	-2,04	0,0421

Female T2D R-squared = 12,89; n=46				
CONSTANT	11,39	0,97	11,73	0,0001
LUl	1,36	0,68	2,00	0,0469
TEr	-1,94	0,70	-2,77	0,0062
GBl	0,88	0,38	2,28	0,0233
KIr	-1,53	0,41	-3,65	0,0003

Female T1D R-squared = 9,15%; n=74				
CONSTANT	13,67	1,03	13,24	0,0001
SPr	0,98	0,36	2,67	0,0080
GBr	-1,18	0,56	-2,10	0,0363
BLl	-1,31	0,42	-3,08	0,0023

In general, the obtained regression models of the connections of the TS channels with the level of glycemia in the capillary blood (Table 2) have a low index of explainable dispersions (R-squared less than 20%). This is probably due to the fact that capillary blood contains different types of sugar and therefore the model turns out to be “blurred”, although the AC connections themselves have a pronounced significance.

In men with T2D, the greatest association of the TS channels with the level of sugar from capillary blood is noted in the small intestinal canal (SI), through which carbohydrates are adsorbed. At the same time, the left and right branches of this channel have different signs of the regression coefficients. A similar situation in this model occurs with the kidney channel (KI), where, according to TCM, energy accumulates in the body. Of the other significant links (**p<0.001), the effect of the stomach canal (+ STr) is noted.

In women with T2D, the greatest association of the TS channels with the level of blood sugar is noted with the channel of the kidneys, triple heater, gallbladder and lungs. Their functional relationships with physiological parameters have been discussed previously. Basically, these are the same systems and channels that are influenced by the insulin dose in these patients.

In men with T1D, all significant connections in the model are marked with channels; SI, GB and BL. However, at the same time, both left and right branches with opposite signs of influence are involved in the model, which is quite surprising!

A similar situation in the regulation of various parameters on the basis of laterality was discussed in detail earlier[5-13], and it is well explained on the basis of the TCM influence of Yin and Yang, which acquire real meaning here as a clear regulatory component. Unfortunately, modern science has not yet reached such an understanding of the situation of carbohydrate metabolism at the right / left level, symmetry and desymmetry.

In **women with T1D**, glycemia levels are associated with the sex hormonal system (-BLl), pancreas (+ SPr), and the state of the nervous system (-GBr). Thus, the level of glycemia in T1D mainly depends on the adsorption of carbohydrates through the small intestine, stress and the effect of sex hormones.

Table 3: Regression models of dependencies thresholds TS channels with glucose from a vein in men and women with T1-T2D.

Male T2D R-squared = 63.95%; n=21				
AC	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	7,04	1,81	3,88	0,0011
LUr	4,22	1,14	3,69	0,0017
HTr	-2,72	1,18	-2,30	0,0334
GBr	1,96	0,84	2,31	0,0322
SPl	3,33	1,35	2,45	0,0337
KIr	1,80	0,74	2,41	0,0365
KIl	-5,88	1,27	-4,60	0,0010

Male T1D R-squared = 39,89%; n=40				
AC	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	11,86	3,71	3,19	0,0029
LUl	-9,59	2,51	-3,81	0,0005
HTl	9,01	2,06	4,36	0,0001
GV	2,85	1,17	2,43	0,0199

Female T2D R-squared = 15,85%; n=67				
CONSTANT	8,29	2,41	3,43	0,0011
SPr	1,80	0,83	2,15	0,0348
STl	-1,96	0,88	-2,22	0,0301

Female T1D R-squared = 19,34%; n=74				
CONSTANT	10,41	2,54	4,08	0,0001
SPr	1,39	0,72	1,93	0,0573
LRr	-2,06	0,85	-2,40	0,0190
BLl	1,90	0,92	2,06	0,0430

Tab. 3 shows the results of the regression analysis of the connections of the TS channels with the level of glucose from venous blood. There is a big difference between arterial blood and venous blood due to their connections with the canals as a whole.[6,17] According to this model, in this group of men with T2D, glucose from a vein is most significantly (*p<0.05) associated with the inverter of both branches of the kidney canal, which can be explained both by an increase in body energy (+ KIr) and by the effect of glycosuria, therefore, growth is –Kil leads to a decrease in glycemia due to increased glucosuria. There are also connections to the TS of the canals by the pancreas, the nervous system, physical activity and the level of oxygenation in the tissues.

In women with T2D, typical significant dependence (*p<0.05) of glycemia are found mainly from the pancreatic and gastric channel. At the same time, the higher the glucose value, the higher the TS of the right branch of the AC of the pancreas, which reflects the proportional decrease in the activity of its B- cells. The growth of indicators of the left (Yang) branch of the AC of the stomach usually reflects its enhanced hypermotorics associated with hunger.

In men with T1D, the glucose level from a vein is most significantly associated with physical activity (***p<0.001), which is reflected by communication with TS the heart channel (+HTl). There is also a connection with the level of tissue oxygenation (-LUl) and the GV channel, which reflects the total energy consumption.

In women with T1D, there are significant associations with the activity of the liver, the hormonal system and the pancreas.

A certain check of the involvement of the TS channels in their relationships with insulin can also be obtained from the relationship models with time after the injection of insulin, presented in Table 4. With increasing time after insulin injection, insulin concentration in tissues decreases, which is reflected in the reaction of the TS channels. The more time passes from the moment of injection, the higher or lower are the parameters of the TS of these channels, depending on the sign of the relationship (+ or -). However, the rate of their change also depends on the dose of insulin and the duration of its action. First of all, attention is paid to the high significance of indicators (**p<0.01) in most channels and the high rate of estimation of dispersion by models, which makes this dependence highly informative. Channels such as SPr, PCr, LIl, STl are distinguished in patients with T2D and LIr, HTr, SPr, PCl, LRr, LUr in patients with T1D, which generally corresponds to connections with insulin doses, however, often with the opposite side and sign of influence.

Table 4: Regression models of dependencies thresholds TS channels with time after insulin injection (minutes) in men and women with T1-T2D.

Male T2D R-squared = 70,17%, n=39				
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	143,43	40,73	3,52	0,0013
LUr	-51,27	15,42	-3,32	0,0022
LIl	138,41	31,95	4,33	0,0001
PCr	118,98	27,23	4,36	0,0001
HTl	-78,98	27,89	-2,83	0,0079
SIl	-107,27	31,81	-3,37	0,0020
SPr	-56,77	12,74	-4,45	0,0001
Female T2D R-squared = 39,14%, n=91				
CONSTANT	275,60	33,06	8,33	0,0001
PCl	-46,34	22,03	-2,10	0,0384
LRr	-23,36	8,87	-2,63	0,0101
STl	41,21	13,19	3,12	0,0025
KIr	-27,73	13,52	-2,05	0,0435
GV	-65,09	26,24	-2,48	0,0152

Male T1D R-squared = 15,26%, n=75				
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
CONSTANT	144,35	22,90	6,30	0,0001
LIr	-29,92	13,30	-2,24	0,0257
PCl	-68,09	20,73	-3,28	0,0012
HTr	48,07	18,18	2,64	0,0089

Female T1D R-squared = 25,85%, n=91				
CONSTANT	229,75	26,12	8,79	0,0001
LUr	-45,92	14,18	-3,23	0,0015
SPr	-38,04	10,41	-3,65	0,0003
LRl	42,54	11,59	3,66	0,0003
GBr	-26,92	12,29	-2,18	0,0300

Since insulin is mainly used before meals, another important parameter to test its effect on the AC is time after meals. These regression data are presented in Table 5. In these models, in essence, the result of two opposite effects is evaluated: food and insulin. In general, the set of channels in these models is also similar to those presented in previous tables.

Table 5: Regression models of dependencies thresholds TS channels with time after meal in man and women with T1-T2D.

Male T2D R-squared = 38,48%, n-113				
Parameter	***Estimate***	***Error***	***Statistic***	***P-Value***
CONSTANT	40,66	25,85	1,57	0,1188
LIr	-61,31	17,61	-3,47	0,0007
LIl	42,15	18,21	2,31	0,0226
TEl	-60,03	20,94	-2,86	0,0050
HTr	-43,59	23,84	-1,82	0,0703
SIl	70,31	27,36	2,56	0,0116
LRl	-34,81	10,14	-3,43	0,0009
GV	29,55	12,60	2,34	0,0210

Male T1D R-squared = 70,17%, n-141				
Parameter	***Estimate***	***Error***	***Statistic***	***P-Value***
CONSTANT	60,19	20,72	2,903	0,0043
STr	24,59	10,26	2,39	0,0179
CV	26,15	11,28	2,31	0,0219

Female T2D R-squared = 25,43%, n-79				
CONSTANT	70,67	27,12	2,60	0,0113
LUr	-43,88	18,90	-2,32	0,0232
LIl	-55,45	21,51	-2,57	0,0121
PCl	64,29	27,35	2,35	0,0217
SIl	58,18	24,38	2,38	0,0198
CV	31,75	14,71	2,15	0,0344

Female T1D R-squared = 33,45%, n-111				
CONSTANT	**40,85**	**26,36**	**1,54**	**0,1244**
LIl	45,52	13,59	3,34	0,0011
LRr	23,70	8,78	2,69	0,0082
STr	-55,76	16,16	-3,45	0,0008
STl	-38,72	16,07	-2,40	0,0178
KIr	38,69	12,06	3,20	0,0018
CV	36,41	14,96	2,43	0,0166

Table 6 shows the general pattern of the relationship of the AC with the glycemic level and insulin dose in T1-T2D, which included the AC, which have the most significant effect on these indicators according to regression, correlation analysis, as well as our practical observations of individual patients. From the analysis it follows that in most cases the same channels in opposite metabolic processes are involved with different signs (vectors) of influence or side of the relationship, if the sign is the same. Signs and the side of the channel may also depend on the time after the injection and the gender of the patients, since some channels initially have different signs of influence in men and women.[12,18]

Table 6: The main relationship of the AC with blood sugar levels and insulin doses in diabetes mellitus.

AC	T1D				T2D			
	Male		Female		Male		Female	
	Glucose	Insulin	Glucose	Insulin	Glucose	Insulin	Glucose	Insulin
LU	-LUl**	+LUr	+LUr**	-	-LUl**	+LUl	+LUl	-LUl
LI	+LIr**	-LIr	+LIr**	-LIr	+LIr**	-LIr	-	+LIl
PC	-	+PCr	-PCl	+PCr	-	-	-	-PCl
TE	-	+TEl	+TEr**	+TEl	-	-TEl	-TEr*	-TEl
HT	+HTl**	-HTl	-	+HTl	-HTr**	+HTl	-HTl**	+HTl
SI	+SIr* -SIl*	+SIl	-	+SIr -SIl	+SIr* -SIl*	+SIr	-	+SIl
SP	+SPr**	-SPr	+SPr**	-SPl	+SPr**	-SPr	+SPr**	-SPl
LR	-LRr**	+LRr	-LRr**	+LRr	-LRl**	-LRr	+LRl**	+LRr
ST	+STl*	-STl	-	+STr	+STr*	-STr	-STl**	+STl
GB	-GBr* +GBl*	-GBl	-GBr*	+GBr	+GBr** -GBl**	+GBl	+GBl* -GBl**	-GBr
KI	-	+KIl	-KIr**	+KIr	-KIr*	-KIl	-KIr*	-KIl
BL	+BLr*	-BLl	+BLl**	+BLl	+BLr*	-	-	+BLl
CV/GV	+GV**	-CV	+GV**	-	+GV**	-CV	-	+CV

* Sugar from capillary blood; ** Glucose from the vein

It is known that with hyperglycemia, the asymmetry between the branches of the channels also increases.[6,8,9] In the course of an adequately selected treatment, symmetry is restored at the level of the right and left branches of certain AC. In case of exceeding the dose of insulin above the optimum for a particular patient against the background of hyperglycemia, initially, the time will come when the channels will be symmetrical, but then the symmetry will change to the opposite, which is characteristic of hypoglycemia. For example, high TS values on the right side of the SP channel at T1D will be noted on the left. This situation will mean that the initial hypofunction of B -cells of the pancreas under the action of insulin will first lead to a decrease in the indicators of the left branch of the SP, which corresponds to the hyperactivity of the A -cells. However, in the case of an excessive dose of insulin, the compensatory mechanisms are disrupted and the A-cells also end up in hypofunction with an increase in the TS of the left branch of this channel. At the level of each organ or physiological system, there are similar mechanisms of counterbalances as a result of which the symmetry is maintained and the basic parameters of the organism's vital activity are located in the normal corridors.

Thus, ***"A correctly selected drug at the bioenergy level should selectively affect a specific channel that is asymmetric as a result of the disease, and its dose should eliminate this asymmetry."*** This rule has been used by us since 2001.[6,8,9] This principle allows individual selection of various drugs and their optimal dose by building mathematical models of interaction at the AC level.

Thus, a properly selected drug at the level of bioenergy should selectively act on the channel, which is asymmetrical as a result of the disease, and its dose should eliminate this asymmetry. This principle takes into account the individual selection of various drugs and their optimal dose by constructing mathematical models of interaction at the AC level. This way you can use the rule: «***Any therapeutic agent in the form of a drug or physical influence should be such that it eliminates the effect of the main pathogenic factor at the bioenergy level and restores the principle of symmetry of the left and right branches of those AC associated with this pathology*».**[5,6,8]

In the models under consideration (Table 1-5), the channels associated with insulin and glycemia were not sufficiently symmetrical, because depending on T1 and T2 only group comparisons were made, and in one sample there were different types of insulin, different manufacturers, etc. analyzed in different patients with different disorders of bioenergetics. At the same time, in the course of these comparisons, the main channels were identified by which the effects of insulin and glycemia can be assessed, which is important for a general understanding of the relationship between glycemia and insulin with the body's bioenergy.

More realistic data on the relationship of insulin and glycemia can be obtained on the basis of an example of thermopuncture monitoring in one of our patients: C ... O, 24 years. Suffer T1D 12 years. Receives intensive insulin therapy using basal-bolus regimens with a total insulin dose of 14 to 55 units per day, depending on the situation. During the monitoring, the patient independently, for 25 days at different times of the day, performed 41 test Akabane with simultaneous measurement of sugar on the glucometer. During this period, the blood sugar level ranged from 5.3 to 20.1 mmol / l. In addition, for assessing various factors affecting the glycemic level, during each test she recorded in arbitrary units (from 1 to 10) the amount of food eaten, the level of physical activity, the temperature outside, the time after meals, as well as the day of the menstrual cycle since the beginning of menstruation. Figure 1 presents its averaged scaled TS profile of the patient at the level of 24 AC normalized to the average level of the profile across all channels.

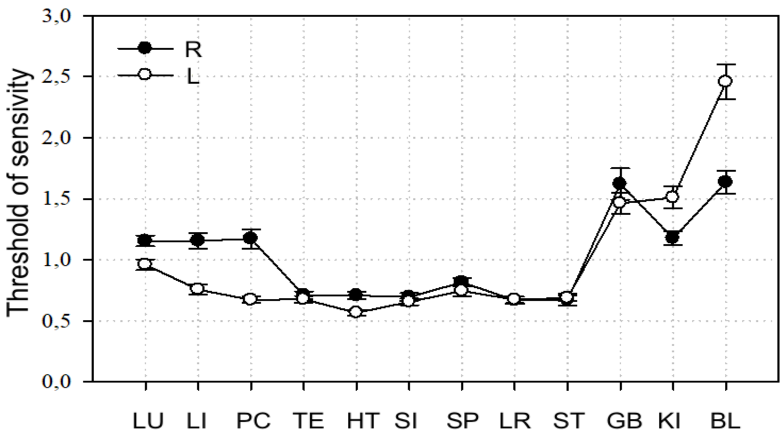

Fig.1: Scaled TS profile 24 channels normalized to the average level of indicators.

As follows from the graph, the greatest asymmetry is observed in the channels –LI, PC, GB, KI, BL which allocates only those AC that actually affect the glycemia level in accordance with the approved methods.[10,11,17] Asymmetry and deviation of indicators in the dynamics of observation in the SP and LR channels are practically absent, which, on the contrary, indicates the absence of the influence of the pancreas and liver on the glycemia level.

To assess the association of AC with glucose and the total insulin dose, regression models were constructed that showed that only the right branch of the gastric canal (STr) was included in these models with different signs of influence. Consequently, the effect of insulin only partially overlaps the effect of glycemia, which explains the high sudden increase in blood sugar.

Insulin = 21,66 + 4,01TEr (*p=,007)* - 6,10LRr(*p=,001)* + 3,47STr(*p=,005)* - 3,49KIr(*p=,002)*

Sugar = 11,02 - 0,28LIr(*p=,034)* - 0,31SPl(*p=,0052)* - 0,74STr(*p=,001)* + 1,01STl(*p=,006)* + 0,25BLr(*p=,002)*

For a more detailed analysis of the links of the AC with the glycemic level, all its values were divided into 4 groups: 1) - <7 (7), 2) - 7-10.9 (15), 3) - 11-16.9 (14), 4) - ≥17 mmol / l (6) (the sizes of the subgroups are shown in brackets). Fig.2 shows the channel profiles depending on the level of glycemia in 4 ranges:

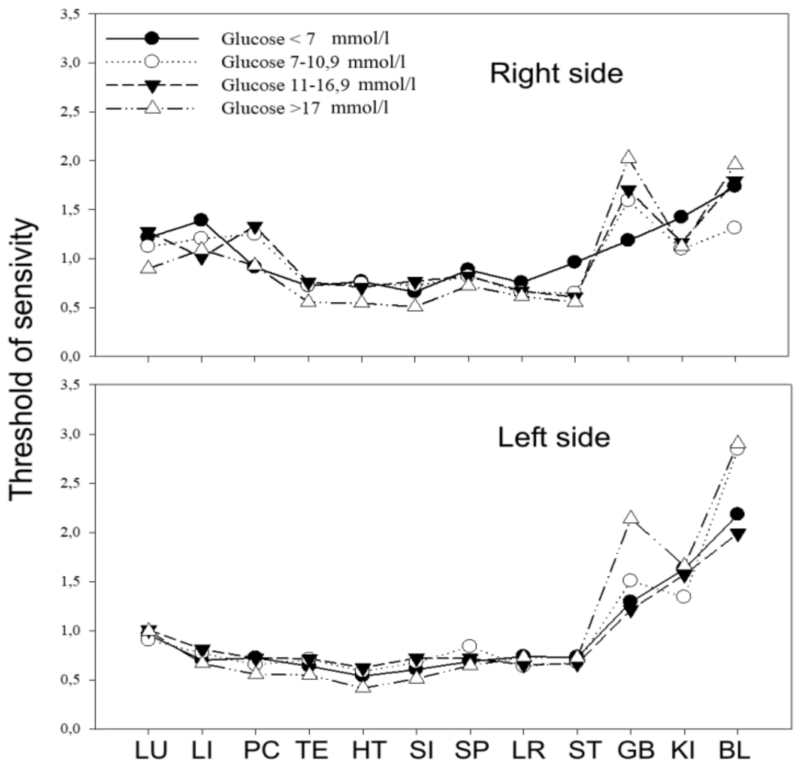

Fig.2. Channel profiles depending on the glycemic level in 4 ranges.

The right Yin branches of the AC associated with anabolic processes[12] generally have a greater variation than the left, especially in the cardiovascular and respiratory systems, as well as in the digestive system. At high sugars more than 17 units there is a sharp rise in the channels GBr+ l, BLl, LUr.

To assess the influence of blood glucose level, factor - glucose level (<7 / 7-10.9 / 11-16.9 / ≥17 units), one-factor analysis of variance ANOVA was performed on the IF values, followed by multiple Scheff comparisons (Scheffe). Significant main effects are obtained for the following IFs: LUr, F (3.41) = 2.9, * p =, 047, SIr, F (3.41) = 2.65, p =, 063 (tendency), STr, F (3.41) = 2.917, * p =, 046, BLr, F (3.41) = 2.58, p =, 068 (tendency), HTl, F (3.41) = 3.05, * p =, 040, SIl, F (3.41) = 2.57, p =, 068 (tendency), GBlm, F (3.41) = 5.6, ** p =, 003, BLl, F (3.41) = 3.22, * p =, 033. Posthokes showed mainly differences between groups with glucose levels of 11-16.9 and more than 17 units for LUr, p =, 058 (tendency), SIr, p =, 077 (tendency) channels and SIl, *p =, 049. For the GBl channel, the data is significantly different in the groups <7 and 11-16.9 units, *p =, 028, in groups 7-10.9 and more than 17 units, p =, 074 (tendency), for BLl between 7-10,9 and 11-16,9, p =, 081 (tendency), as well as for STr, p =, 09 (tendency). Since the subgroups on glucose levels are small, and the data variations are relatively large, in order to preserve essential information, not only significant effects, but also tendencies to significance are given.

Due to the fact that the aggregate of channels is a coherent system, a factor analysis of the relation to the varimax rotation of factors was then carried out to identify the internal structure of the bonds with the glucose level.

As a result, 9 factors were obtained with 78.5% of the variance explained. The level of glucose in the blood with factor load -, 632 entered the factor with AC: STr(,751), KIr (,682) and GBl (-, 417). Thus, high glucose values are accompanied by low STr and KIr channels and high GBl channel values, and vice versa.

To obtain more accurate data, the results of FA were taken as independent variables in the regression analysis for glucose as the dependent variable. As a result, glucose only significantly depends on 1 factor which includes: **-STr, +GBr, -KIr, +GBl**

In contrast to the correlation and regression analysis, only BLr is not included in this factor, since the sex hormones change cyclically and other mathematical analysis is needed to evaluate its effect. The effect of KIr does not give a significant correlation, but it is also essential and the main thing is that it is overlapped by insulin action, since increasing the insulin dose will decrease glycemia through the kidney channel, probably due to glycosuria. Thus, the main triggering factor in glycemic growth in this stress, nervous breakdowns (GB), dietary errors (ST) and the effect of the urogenital system (BL) associated with an irregular monthly cycle are observed.

Consider how the activity of these AC changes after insulin injection (Figure 3). For evaluation using linear regression, we took an interval of 10 minutes, since all the main effects on the AC, according to our observations, occur precisely in this short period of time. The ratio of the right and left branches of these AC was used as an evaluation of the reaction, as a criterion for the presence of symmetry. It should also be borne in mind that prior to the introduction of insulin, these relationships had a large scatter, since they reflected the effects of glycemia from 3 to 22 mmol/l. Therefore, the averaged regression line was used as the resultant for the evaluation of the reaction.

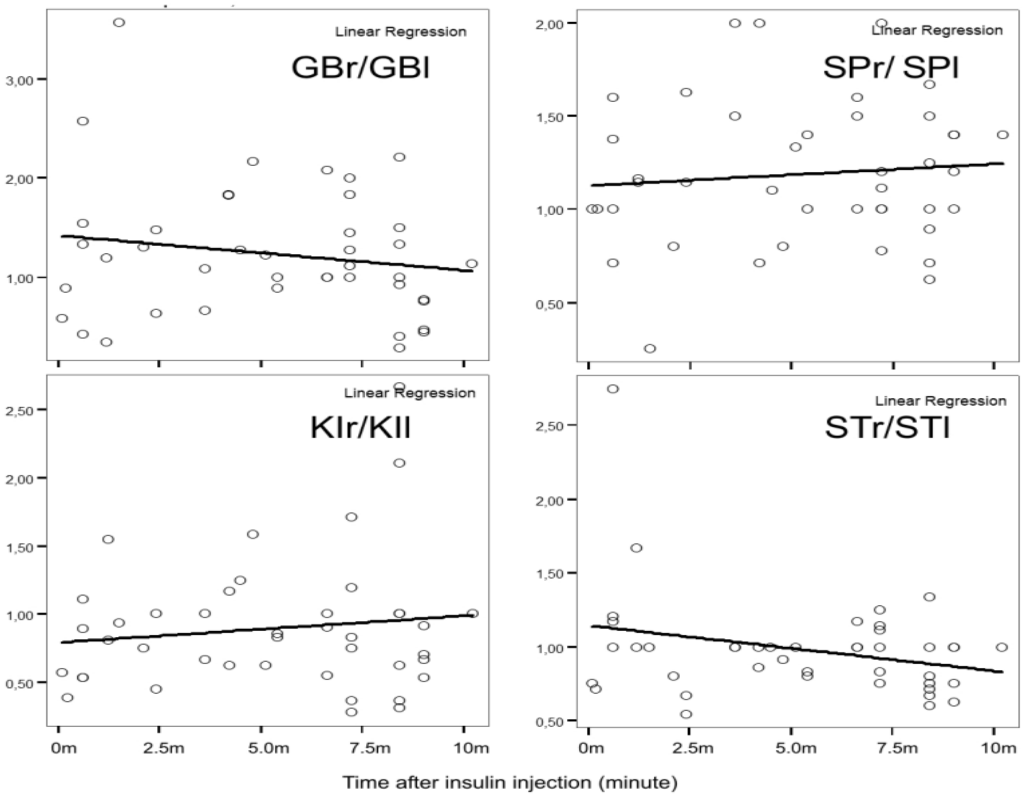

Fig.3. Regression line of the ratio of the right and left branches of the channels GB, KI, SP, ST in the first 10 minutes after insulin injection.

The GB and KI channel as a whole tracks the response, ultimately associated with the restoration of symmetry. On the SP channel, in response to insulin injections, the reaction is increasing, due to an increase in asymmetry due to an increase in the hypofunction of the right branch. Consequently, insulin in this case inhibits the work of its own B-cells. The reaction of the stomach canal (ST) is interesting. Initially, his hypofunction was noted, associated with the asymmetry of the branches, which after 5 minutes passes through the symmetry point (1.0) of both branches, and then its hyperactivity occurs, which is manifested by its hypermotorics and increased secretory function. This reaction can be explained by eating after an insulin injection.

In general, the analysis shows that for effective therapy in this case one insulin is not enough, which does not completely level the effect of hyperglycemia, and in addition it is necessary to take into account other possible factors affecting the body. Therefore, for this patient, an additional correlation analysis was performed, in which the following variables were included: the temperature outside, the amount of food eaten, the level of exercise, the day of the cycle. The results of the analysis are presented in Table 7.

Table 7: The results of the correlation analysis of the links of channels with different effects on the body.

AC	Glucose		After meal		After load		Days of cycle		Had a meal 1-10		Outdoor temperature	
	r	p	r	p	r	p	r	p	r	p	r	p
LUr	-,172	,275	,103	,526	-,336	,060	-,091	,568	-,173	,298	-,030	,866
LIr	-,223	,156	-,107	,512	-,231	,203	-,109	,491	,045	,787	-,025	,889
PCr	-,093	,557	,080	,623	,028	,880	,064	,688	-,068	,685	,203	,251
TEr	-,178	,260	-,052	,749	-,442(*)	,011	-,220	,162	,145	,385	-,229	,192
HTr	-,209	,184	,015	,927	-,316	,078	-,149	,346	,082	,624	-,102	,565
SIr	-,129	,416	,147	,364	-,281	,120	,078	,622	,122	,464	,134	,448
SPr	-,156	,324	-,014	,930	-,121	,510	-,327(*)	,035	-,063	,706	-,334	,053
LRr	-,130	,412	,313(*)	,049	,092	,617	-,174	,270	-,016	,924	-,195	,269
STr	-,348(*)	,024	,203	,208	,262	,147	-,259	,097	-,058	,728	-,187	,289
GBr	,284	,068	-,171	,293	,106	,563	-,058	,715	,029	,862	,118	,505
KIr	-,190	,229	,012	,942	-,040	,829	-,155	,326	,051	,760	-,323	,062
BLr	,323(*)	,037	-,247	,125	-,041	,826	,252	,107	-,003	,986	,267	,126
LUl	,098	,538	,122	,455	,141	,442	-,002	,987	,037	,824	,051	,775
LIl	-,010	,948	,087	,595	-,067	,717	-,328(*)	,034	,205	,217	-,460(**)	,006
PCl	-,124	,433	,050	,761	-,445(*)	,011	-,246	,117	,209	,209	-,416(*)	,014
TEl	-,057	,718	,287	,073	-,279	,121	-,023	,887	,089	,594	-,080	,654
HTl	-,143	,366	,145	,372	-,310	,085	-,031	,845	-,031	,853	,033	,852
SIl	-,051	,749	,048	,768	-,220	,227	-,077	,629	-,123	,462	,026	,886
SPl	-,186	,239	,019	,906	,310	,084	-,035	,827	-,364(*)	,025	,043	,810
LRl	,005	,974	,160	,323	-,075	,682	-,234	,136	,352(*)	,030	-,077	,665
STl	,015	,925	,249	,122	,291	,106	-,216	,170	,064	,705	-,187	,289
GBl	,309(*)	,047	-,115	,479	-,059	,746	,299	,055	,055	,744	,085	,634
KIl	,122	,443	,065	,689	-,055	,763	-,119	,451	,058	,731	-,324	,062
BLl	-,061	,699	-,082	,617	,422(*)	,016	,397(**)	,009	-,141	,399	,343(*)	,047

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

As a result, a significant connection was established between channels with the temperature outside (via LIl, PCl, BLl), on the amount of food (SPl, LRl) and time after food (LRr), physical load (TEr, PCl, BLl) and the day of the cycle that affects on SPr, LIl, BLl. Most of the newly analyzed factors had an effect on the sex hormones through channel BL. The link between SP and LR with the amount of food and time after eating, in our opinion, is related to the functional insufficiency of these systems, which is not observed in healthy people. However, the main factor in the formation of high glycemia is in this case the nervous factor through the GB channel, which in our opinion requires a more specific targeted treatment, rather than treatment according to the "general scheme" without individual circumstances.

The graphs of the dependence of the AC on the glycemic level (Figure 2) revealed the largest bursts of linear parameters of the TS (the higher the TS - the higher the sugar) through the GBr channel, which reflects the state of the peripheral nervous system and the presence of stress reactions. There is a similar linear relationship in the LUr channel, which reflects the level of tissue oxygenation, but this dependence is opposite - the higher the TS, the lower the glycemia. High LUr values are characteristic of high oxygenation of blood and body tissues during physical exertion, for example, when playing sports.[6] It should be noted that such a linear dependence of the AC on various indicators is crucial for reflexotherapy by the method of infrared heating.[14] The positive effect of such address reflexotherapy on a certain branch of the channel according to the established rules on the basis of a diagnostic test may exceed the effect of drug therapy.

Taking into account the analysis carried out, light tranquilizers and hormonal preparations were added to the treatment regimen to normalize the monthly cycle, as well as independent reflex therapy and sports, which allowed increasing the overlap of negative influences in the form of asymmetries for AS which are associated with an increase in glycemia. As a result, substantially normalize blood glucose levels by glycated hemoglobin to –7.12% after 3 months

DISCUSSION

When assessing the AC connections with the glycemic level from the point of view of modern physiology and the theory of nervism, an inexplicable paradox arises: why carbohydrates have absolutely opposite selective significant interaction vectors with different AC branches. For example, the level of sugar from capillary blood from a finger of such channels as SI, GB, BL (Table 2) simultaneously has significant connections with both the left and right branches of the same channels, but with opposite signs. At the same time, the association of AC with venous blood glucose is predominantly unilateral, with the exception of the kidney AC (Table 3). One explanation for this phenomenon is that various optical isomers of sugar - levulose and dextrose, which rotate a different sides.

So, in models with capillary blood, individual glucometers are mainly subjected to the analysis of a mixture of different optical isomers of sugar-levulose and dextrose. Therefore, in these models there are significant connections with both right and left branches of the same channels. In models of communication with blood from a vein, only glucose is predominantly analyzed, which rotates the light beam to the right, being a classic dextrose. Therefore, in the models of relations with it there is a selective influence of one, only the right or left branch of the AC.

The exception for capillary and venous blood sugar is the connection of the glycemia level simultaneously with the left and right branches of the kidney channel, but with different signs of influence due to glycosuria. In models with glucose from a vein (Table 3), in men with T2D, an increase in the left Yang of the kidney canal leads to a significant ($p = 0.001$) decrease in blood glucose due to glucosuria, while an increase in the right (Yin) branch of the kidney canal leads to an increase in glycemia due to cessation of glycosuria.

In models with capillary blood sugar in men with T2D (Table 4), the laterality of the branches of the kidney canal is reversed. This may serve as proof that the left and right branches of the kidney canal selectively interact with the levuloses and dextroses of carbohydrate isomers, depending on their polarization of light. This observation largely confirms the idea that the polarization component of carbohydrates during their metabolism is physically linked to the side of the channel, which selectively affects their metabolism, and the channel itself is a specific signaling system affecting the metabolism of carbohydrates. However, in contrast to, for example, the nervous system, there are completely different principles of regulatory influences based on optical interactions.[19-21] Thus, the AC system is noted in plants and other primitive organisms that have survived to the present day and react mainly to light. During the evolution of living matter, the AC system arose much earlier than, for example, the nervous and humoral system and it was preserved in the human body as a cardiac conduction system, which has no obvious histological differences from the cardiac muscle, but has its own spatial topology.[13]

The difference between the physical properties of acupuncture points was demonstrated using magnetic resonance imaging, infrared imaging, thermography with a liquid crystal display and ultrasound.[22,23] It was found that the network of the connective tissue of the body has a liquid crystal composition and is a high-speed superconducting network for transmitting information throughout the body. For this and other reasons, the “living matrix”, as it is sometimes called, was defined as the primary one corresponding to the Chinese AC system.[24]

In our observations, we recorded an interesting effect when, when stimulating certain points with modulated infrared radiation (F-28Hz, A=920nM), the recording of the treatment process in the video camera noted the appearance of a luminous line in the projection of a certain channel and points on it. In this case, the AC works as an optical fiber.[6,14] This phenomenon also needs further study and may be the key to understanding the work of the AC.

New in this approach is the ability to assess the degree of metabolic disturbances at the level of symmetry loss at the level of the right and left branches of certain channels.[6,13] It should be noted that the problems of symmetry and desymmetry in the body are fundamental and they are still poorly studied in physiology, biochemistry and pharmacology, especially at the level of the influence of drugs on the biochemistry of the body.

According to modern data in the liquid media of which our body consists a violation of symmetry can occur spontaneously due to the action of external and internal factors that act as a trigger regardless of the force of the effect.[22-26] These changes are collective modes or coherent waves responsible for the ordering of molecules in a certain volume of the liquid crystal system of the body or in system areas and organs associated with a particular acupuncture channel.[24]

The triggering ordering does not depend on the strength of the stimulus, but on its synphasicity with possible oscillatory movement of the system components.[25-26] This special phase synchronization acts as a very selective mechanism, protecting it from any noisy background or even strong actions.

Detailed mathematical analysis[25-28] shows that such effects depend on the density of polarization, which does not spread in spherical waves, but remains focused in specific channels, where dynamic self-focused propagation of coherent radiation with its phase synchronization takes place. In such a process, a very important role in the self-organization and functioning of living matter belongs to water, which under certain conditions can form coherent domains.[30]

Energy waves in the connective tissue can “capture” neighboring molecules, cells and biological units into their coherent vibrations. Thus, this optical waveguide can provide a non-dissipative flow of energy and information throughout the body.[29] The shape of the waveguides (channels) is determined by the anatomical properties of the body, the physical properties of the tissue, including the metabolic rate, the water content in the tissues, etc. At the same time, these waveguides are not stationary formations, but rather dynamic channels. For example, after surgical destruction of the pathways on the heart, new ones appear with a different spatial arrangement.[6,13] Channels have some special nodes located at certain points, close to the skin, where the electrical conductivity of the skin and the index of refraction are very different from the environment. The skin has other optical properties, and it acts as a screen. However, there are points on the skin through which you can influence energy channels and information flow, as can be seen from hundreds of years of the practice of reflexology.

The main goal of this study is to show that it is possible to track the effect of any drug on the body based on new physical monitoring principles, through the evaluation of the TS of acupuncture channels, which are a specific signaling system in the body.[5-15] At the same time, in contrast to invasive control of only glycemic level, which in its essence is only a single link in the carbohydrate metabolism chain, using this technique, we monitor the whole chain of metabolic disorders at the level of individual organs and physiological systems involved in the transformation of energy in the body.

In the course of this study, the main effects of two groups of insulin were analyzed in the regression models obtained, without taking into account the characteristics of each of the drugs and its components in each group, and the individual characteristics of the body's response were not taken into account. In the future, when recruiting more statistics, it is possible to conduct a differential analysis of each of the glucose-lowering drugs at the exposure level at the AC, lateral and influence sign, etc. so that on the basis of such a “bioenergy passport” to optimize its impact on a specific patient, taking into account its features in bioenergy. On the other hand, this approach will give new opportunities in the design of new drugs, because a new tool and the principle of assessing their effect on the body has appeared.

A more detailed study of the problem of glycemic control in relation to a specific person revealed a number of additional factors, besides insulin, that actually affect carbohydrate metabolism: this is the level of exercise, external temperature, the day of the cycle for women, volume and calorie content of food eaten, etc. They also need to be considered when choosing an adequate treatment. Moreover, it is much easier and more accurate to do through the assessment of the activity of the AC, rather than, for example, to assess the individual basal metabolism in the body in special chambers, etc.

Usually, in the presence of large jumps in the glycemic level, the attending physicians recommend increasing the insulin dose, which in the given example did not give tangible results. Therefore, mathematical analysis in such cases will help clarify the situation and connect additional targeted treatments. In practice, we usually do correlation and regression analysis and evaluate the channel profile for the presence of variation in indicators for each speaker in the dynamics of observation (deviation). This is usually enough to identify compensatory mechanisms in order to activate them targetedly through the selection of drug therapy, reflexotherapy and lifestyle correction.

The obtained rules of such targeted effects on certain individually calculated points can serve as a basis for further theoretical studies and for improving the devices and methods of monitoring itself, which is carried out using a simple measurement of the frequency converter based on the modified Akabane test, which has a long history.

Disclosure statement

The authors declare that they have no conflicts of interest and no financial interests related to the material of this manuscript.

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