

ABSTRACT:

Previous studies have demonstrated a hormonal increase after effortless exercise, a London University invented motor nerve artificial intelligence method that offers 8 seconds full body contractions simulating strenuous workouts on gym machines. The technology was originally designed and built in London University by the co-inventor of the Pacemaker Gerald Pollock and was upgraded over a period of 40 years empirical research.

In our current study 8 subjects received Treatments with the most recent invention of this technology the Virtual Gym Unique II. Treatments were offered twice weekly for 30 to 45 minutes for a total of three weeks. Blood tests were taken immediately before and after the 6 treatments. The sample consisted of 4 males and 4 female subjects, ages 27-45 years. All subjects were of Chinese descent. BMI, visceral fat, subcutaneous fat and muscle fat varied from subject to subject. All subjects were given 6 Virtual Gym Unique II treatments, 30-45 minutes per treatment twice weekly for 3 weeks.

Results revealed a very high statistically significant decrease in VLDL ($p < 0.001$), the bad cholesterol that carries triglycerides that store energy in cells that is utilized for muscle building and the overall body functioning. Additionally, they revealed a statistically increase in Free T-3 ($p < 0.05$) suggesting an increased metabolic rate. Cortisol levels remained relatively unchanged reflecting some fluctuations from subject to subject that probabilistically did not exceed the level of chance.

HDL, the good cholesterol necessary to avoid cardiovascular disease almost reached statistical significance ($p = 0.25$ / 75% of individuals show an HDL increase). In previous studies where 19 subjects were evaluated after 12 treatments, we found a significant increase of HDL, therefore our current result may simply be an artifact of our small sample and relatively inadequate number of treatments. The same explanation holds for IGF-1 increase that was well above chance ($p = 0.29$ / 71% of individuals show an IGF-1 increase) and DHEA increase that was also above chance ($p = 0.37$ / 63% of the individuals get DHEA increase). None of these variables reached statistical significance. Testosterone for men was statistically insignificant. However, the testosterone for women almost reached significance with a probability level $p = 0.16$ / 84% of female subjects get testosterone increase). All hormones remained within the normal range suggesting that the technology increases metabolism and burns fat to produce energy as suggested by the significant VLDL decrease, without disturbing the body's hormonal balance.

RESULTS

VLDL Cholesterol:

VLDL is considered one of the "bad" forms of **cholesterol**, along with LDL **cholesterol** and triglycerides. This is because high levels **cholesterol** can clog your arteries and lead to a heart attack. The VLDL particles mainly carry **triglycerides** to the cells for energy production. VLDL is similar to **LDL cholesterol**, but LDL mainly carries cholesterol to your tissues instead of triglycerides.

Study results on VLDL Cholesterol:

Results were very highly statistically very significant ($p < 0.001$) where $p = 0.00063$, suggesting that less than 1 in one thousand subjects will not get the VLDL Cholesterol decrease and over 99.9% of the subjects will get a VLDL cholesterol decrease after at least 6 treatments with the Virtual Gym Unique II.

Treatment 1 (X)

$Diff(X - M)$

$Sq. Diff(X - M)_e$

Treatment 2 (X)

$Diff(X - M)$

$Sq. Diff(X - M)_e$

Difference Scores Calculations

Treatment 1

$N_1: 8$

$df_1 = N - 1 = 8 - 1 = 7$

$M_1: 0.97$

$SS_1: 1.28$

$s_{e1} = SS_1 / (N - 1) = 1.28 / (8 - 1) = 0.18$

Treatment 2

$N_2: 8$

$df_2 = N - 1 = 8 - 1 = 7$

$M_2: 0.25$

$SS_2: 0.23$

$s_{e2} = SS_2 / (N - 1) = 0.23 / (8 - 1) = 0.03$

T-value Calculation

$$s_{2,p} = \left[\frac{df_1}{df_1 + df_2} * s_{2,1} \right] + \left[\frac{df_2}{df_2 + df_1} * s_{2,2} \right] = \left[\frac{7}{14} * 0.18 \right] + \left[\frac{7}{14} * 0.03 \right] = 0.11$$

$$s_{2M1} = s_{2,p} / N_1 = 0.11 / 8 = 0.01$$

$$s_{2M2} = s_{2,p} / N_2 = 0.11 / 8 = 0.01$$

$$t = (M_1 - M_2) / \sqrt{s_{2M1} + s_{2M2}} = 0.72 / \sqrt{0.03} = 4.38$$

The p -value is .000623. The result is significant at $p < .001$.

Treatment 1 (X)	Diff(X - M)	Sq. Diff(X - M) ²
1.48	0.51	0.26
1.55	0.58	0.34
0.84	-0.13	0.02
0.53	-0.44	0.19
1.36	0.39	0.15
0.68	-0.29	0.08
0.53	-0.44	0.19
0.77	-0.20	0.04
	M: 0.97	SS: 1.28

Treatment 2 (X)	Diff(X - M)	Sq. Diff(X - M) ²
0.24	-0.01	0.00
0.64	0.39	0.15
0.27	0.02	0.00
0.05	-0.20	0.04
0.24	-0.01	0.00
0.05	-0.20	0.04
0.26	0.01	0.00
0.23	-0.02	0.00
	M: 0.25	SS: 0.23

FREE T-3

Triiodothyronine (T3) is the active thyroid hormone created from the conversion of thyroxine into triiodothyronine. Three different tests measure various aspects of T3. TOTAL, FREE AND REVERSE. **Free T3** is bound to protein and considered the active form of triiodothyronine.

FREE T-3 STUDY RESULTS

Results were statistically significant ($p < 0.05$). T-test indicated significance level at $p = 0.016$ suggesting that around 98.4% will get a Free T-3 increase after at least 6 Virtual Gym Unique II treatments.

Difference Scores Calculations

Treatment 1

N_1 : 8

$$df_1 = N - 1 = 8 - 1 = 7$$

M_1 : 4.28

SS_1 : 0.65

$$s_{21} = SS_1 / (N - 1) = 0.65 / (8 - 1) = 0.09$$

Treatment 2

N_2 : 8

$$df_2 = N - 1 = 8 - 1 = 7$$

M_2 : 4.71

SS_2 : 1.18

$$s_{22} = SS_2 / (N - 1) = 1.18 / (8 - 1) = 0.17$$

T-value Calculation

$$s_{2p} = [(df_1 / (df_1 + df_2)) * s_{21}] + [(df_2 / (df_2 + df_1)) * s_{22}] = [(7 / 14) * 0.09] + [(7 / 14) * 0.17] = 0.13$$

$$s_{2M1} = s_{2p} / N_1 = 0.13 / 8 = 0.02$$

$$s_{2M2} = s_{2p} / N_2 = 0.13 / 8 = 0.02$$

$$t = (M_1 - M_2) / \sqrt{(s_{2M1} + s_{2M2})} = -0.43 / \sqrt{0.03} = -2.38$$

The t -value is -2.37693. The p -value is .016131. The result is significant at $p < .05$.

Treatment 1 (X)

4.29
4.47
4.24
4.09
4.44
4.73
4.27
3.69

Diff($X - M$)

0.01
0.19
-0.04
-0.19
0.16
0.45
-0.01
-0.59
M: 4.28

Sq. Diff($X - M$)²

0.00
0.04
0.00
0.04
0.03
0.20
0.00
0.35
SS: 0.65

Treatment 2 (X)

4.49
4.82
4.47
4.16
4.78
4.82
5.56
4.56

Diff($X - M$)

-0.22
0.11
-0.24
-0.55
0.07
0.11
0.85
-0.15
M: 4.71

Sq. Diff($X - M$)²

0.05
0.01
0.06
0.30
0.01
0.01
0.73
0.02
SS: 1.18

CORTISOL:

Cortisol is a steroid hormone, in the glucocorticoid class of hormones. Cortisol is often called the "stress hormone" because of its connection to the stress response, however, cortisol is much more than just a hormone released during stress. Cortisol can help control blood sugar levels, regulate metabolism, help reduce inflammation, and assist with memory formulation. It has a controlling effect on salt and water balance and helps control blood pressure. In women, cortisol also supports the developing fetus during pregnancy. All of these functions make cortisol a crucial hormone to protect overall health and well-being.

Sometimes tumors on the pituitary or adrenal glands can contribute to a condition known as **Cushing syndrome**, which is characterized by high levels of cortisol in the blood. Individuals with Cushing syndrome will experience rapid weight gain in the face, abdomen, and chest.

Low cortisol levels can cause a condition known as **primary adrenal insufficiency** or Addison disease. While rare, primary adrenal insufficiency is an autoimmune disease that causes damage to the adrenal glands. Symptoms may start slowly, but they can be quite serious. Patients with primary adrenal insufficiency can experience fatigue, muscle loss, weight loss, mood swings, and changes to the skin.

RESULTS:

Results were not significant at the $p < 0.1$ level. Results were equivalent to chance ($p = 0.51$).

suggesting that the virtual gym treatment does not increase cortisol and any cortisol fluctuations may be either due to individual differences, diet or lifestyle.

Difference Scores Calculations

Treatment 1

N : 8

$df = N - 1 = 8 - 1 = 7$

M : 146.88

SS₁: 17946.88

$$s_{21} = SS_1 / (N - 1) = 17946.88 / (8 - 1) = 2563.84$$

Treatment 2

N₂: 8

$$df_2 = N - 1 = 8 - 1 = 7$$

M₂: 167.12

SS₂: 34650.88

$$s_{22} = SS_2 / (N - 1) = 34650.88 / (8 - 1) = 4950.12$$

T-value Calculation

$$s_{2p} = [(df_1 / (df_1 + df_2)) * s_{21}] + [(df_2 / (df_2 + df_1)) * s_{22}] = [(7 / 14) * 2563.84] + [(7 / 14) * 4950.12] = 3756.98$$

$$s_{2M1} = s_{2p} / N_1 = 3756.98 / 8 = 469.62$$

$$s_{2M2} = s_{2p} / N_2 = 3756.98 / 8 = 469.62$$

$t = (M_1 - M_2) / \sqrt{(s_{2M1} + s_{2M2})} = -20.25 / \sqrt{939.25} = -0.66$ The *t* value is -0.66075. The *p* value is .5195. The result is *not* significant at $p < .10$.

Treatment 1 (X)	Diff(X - M)	Sq. Diff(X - M) ²
135	-11.88	141.02
168	21.12	446.27
177	30.12	907.52
135	-11.88	141.02
229	82.12	6744.52
160	13.12	172.27
116	-30.88	953.27
55	-91.88	8441.02
	M: 146.88	SS: 17946.88

Treatment 2 (X)	Diff(X - M)	Sq. Diff(X - M) ²
281.00	113.88	12967.52
163	-4.12	17.02
226.00	58.88	3466.27
149.00	-18.12	328.52
204.00	36.88	1359.77
149.00	-18.12	328.52
113.00	-54.12	2929.52
52.00	-115.12	13253.77
	M: 167.12	SS: 34650.88

HDL Cholesterol:

For **HDL cholesterol**, or "good" **cholesterol**, higher levels are better. High-density lipoprotein (**HDL**) **cholesterol** is known as the "good" **cholesterol** because it helps remove other forms of **cholesterol** from your bloodstream. Higher levels of **HDL cholesterol** are associated with a lower risk of heart disease.

Results

Results were not statistically insignificant (p=0.25). Significance level was well above chance suggesting that around 75% of people will show increased HDL (the good cholesterol) increase immediately after 6 Virtual Gym treatments.

HDL takes time to increase and should be measured after ONE month in order to give a more accurate estimate on whether the HDL increase reached statistical significance after offering the Virtual Gym Unique treatment.

Treatment 1 (X)

$Diff(X - M)$

$Sq. Diff(X - M)_e$

Treatment 2 (X)

$Diff(X - M)$

$Sq. Diff(X - M)_e$

Difference Scores Calculations

Treatment 1

$N_1: 8$

$df_1 = N - 1 = 8 - 1 = 7$

$M_1: 1.46$

$SS_1: 1.44$

$s_{e1} = SS_1 / (N - 1) = 1.44 / (8 - 1) = 0.21$

Treatment 2

$N_2: 8$

$df_2 = N - 1 = 8 - 1 = 7$

$M_2: 1.52$

$SS_2: 1.29$

$s_{e2} = SS_2 / (N - 1) = 1.29 / (8 - 1) = 0.18$

T-value Calculation

$$s_{2p} = \left[\frac{df_1}{df_1 + df_2} * s_{21} \right] + \left[\frac{df_2}{df_1 + df_2} * s_{22} \right] = \left[\frac{7}{14} * 0.21 \right] + \left[\frac{7}{14} * 0.18 \right] = 0.2$$

$$s_{2M1} = s_{2p} / N_1 = 0.2 / 8 = 0.02$$

$$s_{2M2} = s_{2p} / N_2 = 0.2 / 8 = 0.02$$

$$t = (M_1 - M_2) / \sqrt{s_{2M1} + s_{2M2}} = -0.06 / \sqrt{0.05} = -0.25$$

Treatment 1 (X)

0.9
1.03
1.76
1.47
2.09
0.95
1.88
1.6

Diff(X - M)

-0.56
-0.43
0.30
0.01
0.63
-0.51
0.42
0.14
M: 1.46

Sq. Diff(X - M)²

0.31
0.18
0.09
0.00
0.40
0.26
0.18
0.02
SS: 1.44

Treatment 2 (X)

1.04
1.09
2.08
1.66
1.90
1.03
1.91
1.42

Diff(X - M)

-0.48
-0.43
0.56
0.14
0.38
-0.49
0.39
-0.10
M: 1.52

Sq. Diff(X - M)²

0.23
0.18
0.32
0.02
0.15
0.24
0.16
0.01
SS: 1.29

Insulin-like growth factor 1 (IGF-1),

also called **somatomedin C**, is a **hormone** similar in **molecular structure** to **insulin** which plays an important role in childhood growth, and has **anabolic** effects in adults. Excessive IGF-1 leads to the formation of tumors. IGF-1 is currently banned from use by athletes by various sporting bodies.

IGF-1 is a **protein** that in humans is encoded by the *IGF1* **gene**. Rare diseases characterized by inability to make or respond to IGF-1 produce a distinctive type of growth failure. One such disorder, termed **Laron dwarfism** does not respond at all to **growth hormone treatment** due to a lack of GH receptors. **Acromegaly** is a **syndrome** that results when the **anterior pituitary** gland produces excess

Results:

Results were not statistically significant ($p=0.29$)

Results almost reached significance with a significance level higher than chance that around 71% will demonstrate an IGF-1 increase immediately after 6 Virtual Gym treatments.

Difference Scores Calculations

Treatment 1

N_1 : 8

$$df_1 = N - 1 = 9 - 1 = 8$$

M_1 : 25.55

SS_1 : 300.49

$$s_{e1}^2 = SS_1 / (N - 1) = 300.49 / (9 - 1) = 37.56$$

Treatment 2

N_2 : 8

$$df_2 = N - 1 = 8 - 1 = 7$$

M_2 : 24.75

SS_2 : 171.79

$$s_{22} = SS_2 / (N - 1) = 171.79 / (8 - 1) = 24.54$$

T-value Calculation

$$s_{2p} = [(df_1 / (df_1 + df_2)) * s_{21}] + [(df_2 / (df_2 + df_2)) * s_{22}] = [(8 / 15) * 37.56] + [(7 / 15) * 24.54] = 31.49$$

$$s_{2M1} = s_{2p} / N_1 = 31.49 / 9 = 3.5$$

$$s_{2M2} = s_{2p} / N_2 = 31.49 / 8 = 3.94$$

$$t = (M_1 - M_2) / \sqrt{(s_{2M1} + s_{2M2})} = 0.8 / \sqrt{7.43} = 0.29$$

Treatment 1 (X)	Diff(X - M)	Sq. Diff(X - M) ²
25.97	0.42	0.17
28.18	2.63	6.90
21.98	-3.57	12.77
32.33	6.78	45.92
32.27	6.72	45.11
21.14	-4.41	19.48
32.27	6.72	45.11
19.98	-5.57	31.06
15.86	-9.69	93.96
	M: 25.55	SS: 300.49

Treatment 2 (X)	Diff(X - M)	Sq. Diff(X - M) ²
24.71	-0.04	0.00
30.12	5.37	28.84
17.85	-6.90	47.61
29.21	4.46	19.89
20.11	-4.64	21.53
28.52	3.77	14.21
28.08	3.33	11.09
19.40	-5.35	28.62
	M: 24.75	SS: 171.79

DHEA

Dehydroepiandrosterone, also known as androstenolone, is an endogenous steroid hormone. It is important for creating estrogen and androgen sex hormones and contributes to the development of so-called androgenic effects, or masculinization.

DHEA is an immune hormone that has been associated with increased bone density, increased collagen production, improved immunity.

However abnormal levels of DHEA lead to severe symptoms including acne, abnormal hair growth, Breast pain in men, interfering with the function of other hormones such as insulin, estrogen, lowered good cholesterol (HDL) leading to heart disease, liver problems and irritability.

Results:

Results were not statistically significant ($p=0.37$). The DHEA significance level was above chance suggesting that around 63% of people will show a DHEA increase immediately after 6 Virtual Gym treatments.

Difference Scores Calculations

Treatment 1

N_1 : 8

$$df_1 = N - 1 = 8 - 1 = 7$$

M_1 : 6.87

SS_1 : 101.63

$$s_{21} = SS_1 / (N - 1) = 101.63 / (8 - 1) = 14.52$$

Treatment 2

N_2 : 8

$$df_2 = N - 1 = 8 - 1 = 7$$

M_2 : 7.72

SS_2 : 184.25

$$s_{22} = SS_2 / (N - 1) = 184.25 / (8 - 1) = 26.32$$

T-value Calculation

$$s_{2p} = [(df_1 / (df_1 + df_2)) * s_{21}] + [(df_2 / (df_2 + df_1)) * s_{22}] = [(7 / 14) * 14.52] + [(7 / 14) * 26.32] = 20.42$$

$$s_{2M1} = s_{2p} / N_1 = 20.42 / 8 = 2.55$$

$$s_{2M2} = s_{2p} / N_2 = 20.42 / 8 = 2.55$$

$$t = (M_1 - M_2) / \sqrt{(s_{2M1} + s_{2M2})} = -0.85 / \sqrt{5.1} = -0.38$$

TESTOSTERONE:

Men's testosterone result was not statistically significant and testosterone fluctuations from subject to subject appeared to be either due to individual differences or chance

The women's testosterone score was almost statistically significant. It was $p=0.16$ when to reach significance it should be $p<0.1$

The t value is -1.07871 . The p value is $.16108$. The result is *not* significant at $p < .10$.

Treatment 1

N_1 : 4

$$df_1 = N - 1 = 4 - 1 = 3$$

M_1 : 0.43

SS_1 : 0.06

$$s_{21} = SS_1 / (N - 1) = 0.06 / (4 - 1) = 0.02$$

Treatment 2

N_2 : 4

$$df_2 = N - 1 = 4 - 1 = 3$$

M_2 : 0.54

SS_2 : 0.06

$$s_{22} = SS_2 / (N - 1) = 0.06 / (4 - 1) = 0.02$$

T-value Calculation

$$s_{2p} = [(df_1 / (df_1 + df_2)) * s_{21}] + [(df_2 / (df_1 + df_2)) * s_{22}] = [(3/6) * 0.02] + [(3/6) * 0.02] = 0.02$$

$$s_{2M1} = s_{2p} / N_1 = 0.02 / 4 = 0$$

$$s_{2M2} = s_{2p} / N_2 = 0.02 / 4 = 0$$

$$t = (M_1 - M_2) / \sqrt{(s_{2M1} + s_{2M2})} = -0.11 / \sqrt{0.01} = -1.08$$

Discussion:

Study results demonstrated that the Virtual Gym Unique II is very effective in elevating Free T-3, the active metabolite of TSH, the agent in control of the biological action that influences the body's metabolism. The Free T-3 increase remained within the normal range suggesting that the Virtual Gym Unique II treatment increases metabolism but without causing hormonal imbalance.

Additionally, Virtual Gym Unique II Treatments significantly decreased VLDL, the cholesterol type carrying triglycerides which are used by cells in the body for energy production. The results on Triglycerides and LDL were statistically insignificant. This result juxtaposed to the highly significant decrease of VLDL may suggest that the body utilizes only the triglycerides necessary to fulfil the muscle building and optimum body functioning and does not indiscriminately decrease LDL cholesterol and triglycerides, a certain amount of which is necessary in building cells and storing energy. It is expected from the results of previous studies that in subjects with abnormally elevated LDL cholesterol and triglycerides, more treatments and testing a month after treatment may reveal normal levels in these variables.

No significant changes in Cortisol were observed suggesting that the Virtual Gym Unique II does not stress the body. None of the Cortisol fluctuations appeared to reach levels above chance.

There were increases in IGF-1 (75%), DHEA (63%) and HDL(71%), the good cholesterol, that were well above chance, suggesting that most of the subjects demonstrated an increase in these variables, which however did not reach a statistical significance. Again, it is expected that more treatments and additional testing may increase the values of these hormones to statistically significant levels, which however, do not rise above the normal range.

All hormonal levels remained in the normal range with the exception of one subject who showed an abnormal increase in DHEA that may be a temporary biological coping technique to counterbalance the subjects suspected borderline medical conditions. Any

hormone increasing and remaining above the normal range is an undesirable result suggesting hormonal imbalance. In contrast previous research has shown an overall statistically significant hormonal increases that were always within the normal range after Virtual Gym or Ion Magnum (an earlier version of the technology) treatments.

The current study was a pilot experiment with a small sample of subjects receiving about half of the number of treatments (only six) usually recommended, which is around twelve. Additionally, testing immediately after treatment may have been an inadequate interval in showing sustainable hormonal and cholesterol changes.

TSH and T4 were not measured, therefore the metabolic profile was rather incomplete. For diagnostic purposes, a low T3 value accompanied by a high TSH value is considered evidence of hypothyroidism. By contrast, a low TSH value accompanied by a high T3 value is considered evidence of hyperthyroidism.

The sample was heterogeneous in terms of age (27-45 years of age) and therefore hormonal levels, possibly interfering with the significance of the overall hormonal profiles since hormonal behaviour distinctly varies in different ages.

There were also some methodology problems where one of the Virtual Gyms Unique had less channels than the other possibly somewhat compromising treatment results.

More research with a larger sample of at least 12 people receiving at least 12 Virtual Gym treatments is necessary. Hormonal testing should be more thorough and should include both saliva, hair and blood tests for a more accurate assessment. All variables should be tested before treatment, immediately after treatment and one month after treatment.