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The long-term effects of effortless exercise on hormonal balance and health

Abstract

The practice of regular physical activity is recommended worldwide by different public health agencies for primary or secondary prevention of many health problems. Many interrelated biological mechanisms may underlie this association, such as the effect of physical activity on glucose metabolism, liver function, inflammation, immune function, and sex hormones. A previous study investigated the hypothesis that different exercise modalities including effortless exercise initiate anti-inflammatory, reparatory, and detoxification processes reinstating liver function, hormonal balance, visceral fat reduction and increased muscle mass. The current study explored the long-term results of effortless exercise on some of the same hormones previously researched such as Triiodothyronine (T3), testosterone and cortisol, as well as variables associated with optimal hepatic functioning and overall health, such as albumin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transferase (GGT) and bilirubin. Ten overweight individuals with an average BMI of 23.2 and an age range from 39 to 51 years old received six one-hour treatments. Blood tests were taken before the first treatment and after an average of 7 months. Subjects did not comply with the clinic's nutritional recommendations. They maintained a high-caloric diet and an overall inactive lifestyle despite the clinic's warning that their habitual patterns of living would be deleterious to their health. After an average of 7 months, AST and bilirubin remained optimally decreased in 100% of the subjects at a statistical significance level of $p<0.0001$ and $p<0.01$ respectively. GGT remained significantly decreased ($p<0.01$) in 80% of subjects and increased in 10% of subjects who were reported with GGT below the normal range. T3 and testosterone remained significantly increased ($p<0.05$) in 60% of the subjects, while cortisol remained decreased ($p<0.05$) in 70% of the subjects. Basal Metabolic Rate (BMR) and muscle mass remained increased in 80% of subjects at $p<0.01$ and $p<0.05$ respectively. Waist circumference remained significantly decreased ($p<0.01$) in 100% of the subjects after 7 months. Results of this longitudinal study indicate that effortless exercise has several health benefits for the majority of individuals, irrespective of their diet and lifestyle.

Keywords: basal metabolic range, muscle mass, effortless exercise, aerobic exercises, resistance exercises, effortless exercise, Triiodothyronine (T3), testosterone, cortisol, optimal hepatic functioning, liver health, albumin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transferase (GGT), bilirubin, waist circumference reduction

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Abbreviations: T3, triiodothyronine; AST, aspartate aminotransferase; ALT, alanine aminotransferase; GGT, gamma-glutamyl transferase; BMR, basal metabolic rate; VLDL, very low-density lipoproteins; NFLD, non-alcoholic fatty liver disease; CRP, C-reactive protein

Introduction

Lasers have made a valuable contribution in cutting or removing tissue during surgery that is necessary for medical purposes, due to being less invasive, more accurate and better controlling the risk of bleeding and inflammation than traditional surgical methods.[1] Laser or RF lipolysis studies on visceral fat reduction and hormonal regulation are sparse, based on animal models in the case of RF, or a combination of laser technology with exercise, delivering confounding results that may not have been obtained if the subjects underwent laser procedures alone.[2,3] Overall, targeting deeper layers of visceral fat that wrap around and penetrate vital organs with trauma-producing procedures is contraindicated due to the danger of causing irreparable damage to vital organs. Any type of lipolysis, including laser and RF lipolysis involves the release of toxins, including persistent organic pollutants (POS). The cooperative function of the circulatory and lymphatic systems eventually eliminates such toxins through the kidneys, liver, and immune system, but only in individuals with healthy liver, kidneys and immunity, provided that the circulatory system is not blocked by deposits of very low-density lipoproteins (VLDL), triglycerides, and the lymphatic and immune systems are not overwhelmed by excess toxicity and inflammation. Laser and RF technologies do not directly interact with lymphatics or immunity, nor they are designed to enhance liver or kidney function. They rely entirely on the body to perform the detoxification which in turn depends on the level of erythrocyte separation. Detoxification may be significantly compromised in patients with erythrocyte aggregation and poikilocytosis that arises from excess radical oxygen species in the blood. Laser and RF marketing companies incorrectly imply without evidence, that all bodies, including unhealthy bodies, shall perform efficient detoxification after the laser of RF lipolysis.[4,5] Lasers and RF may be appropriate for young healthy adults. However, laser and RF slimming may not be the best choice for those who need to reduce their visceral fat for health reasons: i.e. older individuals with pre-existing, undiagnosed or inconspicuously developing medical disorders with sedentary lifestyles and high caloric diets. The most effective alternative for these individuals is the least popular one: Exercise. The one thing that has become harder with age and for which they may have legitimate reasons to decline, due to career or other responsibilities that allow no time for gym or sports.

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Unlike lasers and RF, all exercise modalities, including effortless exercise, are vital in initiating the detoxification process that ultimately reduces inflammation and facilitates hormonal balance. Earlier research on NFLD (non-alcoholic fatty liver disease) patients who received 15 effortless exercise treatments[6] demonstrated that this type of exercise can initiate reparative processes, as adipocyte-derived mesenchymal stem cells differentiate into hepatocytes that subsequently repair the liver. The study demonstrated a statistically significant optimization of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), C-reactive protein (CRP), triglycerides, creatinine, and bilirubin. Additionally, the study reported a statistically significant decrease in visceral fat, and cortisol and a statistically significant increase in serum testosterone, BMR and skeletal muscle mass. The current study explored the long-term effects of effortless exercise on some of the same variables previously studied.[6]The goal of the study was to assess whether individuals with a sedentary lifestyle and a high-caloric diet can maintain the health benefits provided by their effortless lifestyle treatments without any lifestyle changes. The following variables were tested, which are listed here with accompanying information on their specific or general contribution to an individual's overall health status.

Alanine aminotransferase (ALT)

A number of researchers[7,8] have postulated that ALT is usually elevated in the majority but not all individuals with liver disease. According to a study of 222 individuals, 23% of the subjects had normal ALT.[9] ALT is an enzyme primarily found in the liver, also known as serum glutamic-pyruvic transaminase (SGPT). It often produces jaundice (yellow skin or eyes), nausea, fatigue, light-coloured stool and dark-coloured urine.

Aspartate aminotransferase (AST)

Two clinical trials on a total of 645 subjects reveal that AST is a reliable predictor of fatty liver disease.[10,11] Patients with elevated levels of AST present similar symptoms as those observed in individuals with increased ALT values, which include jaundice, nausea, fatigue, swollen belly, swelling of the ankles, bruises, etc.

Elevated cortisol undermines health status

Elevated cortisol levels have also been associated with liver dysfunction in some studies,[12] but not others.[13] Elevated cortisol is negatively correlated with overall health status, and has been associated with a number of medical conditions.[14] High cortisol induces a number of clinical disorders including infections, depression and premature aging.[15] Excess cortisol has been correlated with cognitive decline, neurodegeneration and Alzheimer's disease.[16] Elevated cortisol levels manifested in Cushing's disease appear to interfere with verbal learning, memory, and visual-spatial ability.[17]

Albumin

Albumin is a plasma protein that regulates colloid osmotic pressure which increases as a result of erythrocyte aggregation. Albumin is crucial in transporting thyroxine, bilirubin, and L-tryptophan which has anti-depressant abilities due to being transformed into serotonin. It also binds with nitric oxide (a gas that increases blood flow by relaxing the vessels) and free fatty acids. Albumin is a core component of pharmacokinetic and toxicokinetic processes, binding to almost all known drugs including halothane anaesthetics.[18,19]

Gamma-glutamyl transferase (GGT)

GGT has been traditionally used to assess fatty liver disease and hepatic inflammation. According to recent research, GGT has been associated with 18% of cardiovascular disorders and has been highly correlated with the risk of coronary heart disease, type 2 diabetes and stroke. Importantly, individuals who generally appear healthy may have high GGT levels, a sign that should be seriously evaluated to prevent an inconspicuous medical condition from insidiously developing underneath the false front of normality.[20,21]

Testosterone

This is a hormone involved in a number of vital functions including healthy libido that can positively affect mood, bone and muscle mass increase, glycolysis, and cholesterol metabolism. Testosterone serves as a protective mechanism against several medical conditions, such as insulin resistance, type 2 diabetes, metabolic syndrome, osteoporosis and cardiovascular disease.[22,23]

The results of exercise

Research has provided both internal and external validity to studies reporting the positive effects of exercise on overall health.[24–26] Several research studies that have used an effortless exercise technology, originally invented at London University, have reported optimal levels of creatinine, bilirubin, C-reactive protein (CRP), cortisol, VLDL (very low-density lipoprotein), HDL (high-density lipoprotein), glucose, insulin, and triglycerides. This line of research has also demonstrated a significant decrease in visceral and subcutaneous fat, and a within-normal-range increase of testosterone, free triiodothyronine (T3), the active part of the thyroid hormone, growth hormones, and a balanced profile of leptin and ghrelin that is necessary to stabilize appetite and eliminate cravings, thus avoiding weight gain rebound.[27–30]

How effortless exercise works

The treatment sends a motor nerve blueprint signal that was developed and upgraded over a period of 47 years, originally invented at London University. This resonates with the nervous system, exciting the sensory nerves which carry the signal to the brain, triggering the secretion of hormones that naturally release the fat contents into the bloodstream which include endogenous stem cells. Adipose tissue contents are used as an energy source to increase muscle mass, and repair vital organs. Simultaneously, the brain synchronizes the motor nerves to induce a full-body coordinated contraction that is experienced as the complex strenuous workout performed in a gym. This process is fundamentally different from electrostimulation which directly depolarizes small clusters of muscle cells, without involving the central nervous system and without causing a full-body coordinated muscle contraction as it happens during regular exercise.

Methodology

Ten overweight Malaysian individuals with an average BMI of 23.2 with an age range from 39 to 51 years received an average of six, one-hour treatments. Blood tests were taken before the first treatment and after an average of 7 months. The BMR, and muscle mass increase were determined by a conductance scale. Waist circumference was documented by a measuring tape. Subjects who consented to participate in the study were treated by the same doctor who had no personal interest in the direction of the results. Blood tests were administered by a professional who was trained in that area and who had no interest in the direction of the results. Subjects that were included in the study did not report any medical or mental disorders during their intake interview.

The clinic made nutritional recommendations and proposed lifestyle changes to all subjects. All subjects were given a food intake

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questionnaire to monitor their eating habits and lifestyle and were warned on how their sedentary habitual patterns could be deleterious to their health. Only subjects that were non-compliant with these instructions were included in the study. All subjects included in the study maintained a high-caloric diet and an overall inactive lifestyle with the effortless exercise treatments being the only exception. Therefore, nutrition and living habits could not have a confounding effect on any health benefits gained by effortless exercise. This clinical trial was based on a small sample. However, it is rather unlikely that selection bias posed a threat to internal validity since neither the author nor the doctors and technicians were involved in subject selection. Subjects' participation depended entirely on the subjects' willingness to finance their treatments and blood tests, as well as consent to being included in the research.

Variables measured

I. Serum Triiodothyronine (T3)

II. Serum Testosterone

III. Serum Cortisol

IV. Albumin

V. Serum aspartate aminotransferase (AST)

VI. Serum alanine aminotransferase (ALT)

VII. Serum Gamma-glutamyl Transferase (GGT)

VIII. Serum Bilirubin

IX. Basal Metabolic Rate (BMR)

X. Muscle Mass (MM)

XI. Waist Circumference

Results

T-tests statistical analyses unveiled the following results:

Triiodothyronine (T3)

After an average of seven months following 6 one-hour effortless exercise treatments, Triiodothyronine (T3) remained **significantly increased** by 12% in 60% of the subjects at the $p<0.05$ statistical significance level.

T3 pmol/L. Normal Range 2-7 pmol/L

Mean: 0.39

$\mu = 0$

$S2 = SS/df = 1.01/(7-1) = 0.17$

$S2M = S2/N = 0.17/7 = 0.02$

$SM = \sqrt{S2M} = \sqrt{0.02} = 0.15$

$t = (M - \mu)/SM = (0.39 - 0)/0.15 = 2.49$

The value of t is 2.48907. The value of p is .04722. The result is significant at p <0.05.

Testosterone

After an average of seven months following 6 one-hour effortless exercise treatments, testosterone remained **significantly increased** at the $p>0.1$ level of statistical significance in 60% of the subjects. Testosterone increased by 37.9% in the female subjects and 166.3% in the male subject.

Testosterone: Normal Range Females: 0.5-2.4 nmol/L. Males: 10-35 nmol/L

Difference Scores Calculations

Mean:$0.22\mu = 0$

$S2 = SS/df = 0.11/(5-1) = 0.03$

$S2M = S2/N = 0.03/5 = 0.01$

$SM = \sqrt{S2M} = \sqrt{0.01} = 0.07$

T-Value Calculation

$t = (M - \mu)/SM = (0.22-0)/0.07 = 2.99$

The value of t is 2.993821. The value of p is .04019. The result is significant at p <0.05

Cortisol

After an average of seven months following 6 one-hour effortless exercise treatments, Cortisol remained **significantly decreased** at the $p>0.05$ level of statistical significance in 70% of the subjects.

Cortisol was **below the normal range** in 10% of the subjects. Cortisol was optimally elevated to enter the normal range for this 10% of subjects.

Overall 80% of subjects had a lasting health benefit 7 months after 6 one-hour treatments. This percentage included 70% of subjects with **elevated cortisol** who manifested a **long-term cortisol decrease** and 10% of subjects with **low cortisol** below the normal range, whose cortisol remained **optimally increased** to be within the normal range, 7 months after 6 one-hour treatments. **Cortisol taken only during the AM: Normal Range 140-690-nmol/L**

Difference Scores Calculations

Mean: -22.29

$\mu = 0$

$S^2 = SS/df = 657.43/(7-1) = 109.57$

$S^2_M = S^2/N = 109.57/7 = 15.65$

$S_M = \sqrt{S^2_M} = \sqrt{15.65} = 3.96$

T-value Calculation

$t = (M - \mu)/S_M = (-22.29 - 0)/3.96 = -5.63.$

The value of t is -5.632834. The value of p is .00134. The result is significant at p < 0.01.

Albumin

After an average of seven months following 6 one-hour effortless exercise treatments, Albumin remained significantly increased in 30% of the subjects. This number of subjects was too small to calculate the significance value. 70% of subjects showed no significant increase in albumin after seven months. However, the albumin values in 70% of individuals were already optimally elevated so further elevation could push albumin above the normal range.

Albumin Normal Range: 34-54 G/L

Aspartate Aminotransferase (AST)

After an average of seven months following 6 one-hour effortless exercise treatments, Aspartate Aminotransferase (AST) remained significantly decreased by

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-18% in 100% of the subjects at the p<0.0001 statistical significance level**.**

Aspartate Aminotransferase (AST): Normal Range: Males 14-20 U/L Females 10-36 U/L

Difference Scores Calculations

Mean: -1.89

$\mu = 0$

$S^2 = SS/df = 4.89/(9-1) = 0.61$

$S^2_M = S^2/N = 0.61/9 = 0.07$

$S_M = \sqrt{S^2_M} = \sqrt{0.07} = 0.26$

T-value Calculation

$t = (M - \mu)/S_M = (-1.89 - 0)/0.26 = -7.25$

The value of *t* is -7.248824. The value of *p* is .00009. The result is significant at p<0.0001

Alanine Aminotransferase (ALT)

After an average of seven months following an average of 6 one-hour effortless exercise treatments, Alanine Aminotransferase (ALT) remained **significantly decreased** by

-23% in 40% of the subjects with elevated ALT.

40% of the subjects with ALT **below the normal range** had a +35% **optimal increase** of ALT. Both samples were too small to calculate statistical significance. 20% of the subjects did not show any fluctuations related to ALT.

Alanine Aminotransferase (ALT) Normal Range: Males 19-25 U/L Females 29-33 U/L

Gamma-glutamyl Transferase (GGT)

After an average of seven months following 6 one-hour effortless exercise treatments, Gamma-glutamyl Transferase (GGT) remained **significantly decreased** by -10.4% in eight out of 10 subjects (80%) subjects at the p<0.01 statistical significance level**.** 10% of the subjects had GGT values **below the normal range**. These subjects' low GGT was **optimally elevated** to be within the normal range.

Gamma-glutamyl Transferase (GGT): Normal Range: Males 14-20 U/L Females 10-36 U/L

Difference Scores Calculations

Mean: -1.12

$\mu = 0$

$S^2 = SS/df = 2.88/(8-1) = 0.41$

$S^2_M = S^2/N = 0.41/8 = 0.05$

$S_M = \sqrt{S^2_M} = \sqrt{0.05} = 0.23$

T-value Calculation

$t = (M - \mu)/S_M = (-1.12 - 0)/0.23 = -4.97$

The value of t is -4.965096. The value of p is .00163. The result is significant at p < 0.01

Bilirubin

After an average of seven months following 6 one-hour effortless exercise treatments, Bilirubin remained **significantly decreased** in 100% of the subjects at the p<0.01 statistical significance level**.**

Bilirubin: Normal Range: Males 14-20 U/L Females 10-36 U/L Difference Scores Calculations

Mean: -1.67

$\mu = 0$

$S^2 = SS/df = 14/(9-1) = 1.75$

$S^2_M = S^2/N = 1.75/9 = 0.19$

$S_M = \sqrt{S^2_M} = \sqrt{0.19} = 0.44$

T-value Calculation

$t = (M - \mu)/S_M = (-1.67 - 0)/0.44 = -3.78$

The value of t is -3.779645. The value of p is .00539. The result is significant at p < 0.01.

Basal metabolic rate (BMR)

After an average of seven months following 6 one-hour effortless exercise treatments, Basal Metabolic Rate (BMR) remained **significantly increased** in 80% of the subjects at the p<0.01 level of statistical significance.

Difference Scores Calculations

Mean: 46

$\mu = 0$

$S^2 = SS/df = 8914/(8-1) = 1273.43$

$S^2_M = S^2/N = 1273.43/8 = 159.18$

$S_M = \sqrt{S^2_M} = \sqrt{159.18} = 12.62$

T-value Calculation

$t = (M - \mu)/S_M = (46 - 0)/12.62 = 3.65$

The value of t is 3.64599. The value of p is .00822. The result is significant at p < 0.01.

Waist circumference

After an average of seven months following 6 one-hour effortless exercise treatments, Waist Circumference remained **significantly decreased** in 100% of the subject at the p<0.01 level of statistical significance

Difference Scores Calculations

Mean: -1.55

$\mu = 0$

$S^2 = SS/df = 17.23/(10-1) = 1.91$

$S^2_M = S^2/N = 1.91/10 = 0.19$

$S_M = \sqrt{S^2_M} = \sqrt{0.19} = 0.44$

T-value Calculation

$t = (M - \mu)/S_M = (-1.55 - 0)/0.44 = -3.54$

The value of t is -3.543018. The value of p is .00628. The result is significant at p < 0.01.

Muscle mass

After an average of seven months following 6 one-hour effortless exercise treatments, Muscle Mass remained **significantly increased** in 80% of the subject at the p<0.05 level of statistical significance**.**

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Difference Scores Calculations

Mean: 1.3

$\mu = 0$

$S^2 = SS/df = 10.42/(7-1) = 1.74$

$S^2_M = S^2/N = 1.74/7 = 0.25$

$S_M = \sqrt{S^2_M} = \sqrt{0.25} = 0.5$

T-value Calculation

$t = (M - \mu)/S_M = (1.3 - 0)/0.5 = 2.61$

The value of t is 2.609962. The value of p is .02006. The result is significant at $p < 0.05$.

Discussion

One of the most important aspects of blood analysis is paying attention to whether results unfold towards two opposite directions, some being above the normal range and others being below the normal range. Health is signified by results that are within the normal range. Results above or below the normal range are pathological. In our sample, 40% of the subjects with high ALT showed an optimal ALT decrease after the 6 treatments. 40% of subjects with low ALT that was below or at the borderline of the normal range, exhibited an increase in ALT. In other words, a total of 80% of subjects gained a health benefit as a result of the 6 effortless exercise sessions. ALT was optimized in 80% of the subjects. This result included 40% of subjects with high ALT who manifested a significant decrease in ALT, and 40% of subjects with low ALT that demonstrated an ALT increase after the six treatments. As previously noted, increased ALT blood levels indicate liver disease. On the other hand, low ALT levels are correlated with frailty and an increased risk of mortality.[32] A total of 80% of the subjects showed health benefits related to cortisol. Cortisol was decreased in 70% of the subjects with high cortisol and increased in 10% of the subjects whose cortisol was below the normal range. High cortisol is associated with Cushing's disease, while low cortisol is correlated with a hypothalamic-pituitary-adrenal deficit reflected in fibromyalgia and Addison's disease.[33,34]

GGT had a similar pattern of results with 80% of the subjects having a statistically significant long-term decrease in their GGT levels and 10% of subjects whose GGT was below the normal range getting a long-term increase, totalling 90% of the subjects that had a long term health benefit in this variable. AST and Bilirubin remained consistently reduced in 100% of the subjects, seven months after initiating treatments at a high level of statistical significance of $p<0.001$ and $p<0.01$ respectively. AST and bilirubin presented the most robust consistent effects of effortless exercise on this particular population. Lifestyle is a crucial aspect of health maintenance. Our subjects did not follow nutritional recommendations and were non-compliant with lifestyle changes. Still, after only six sessions of effortless exercise, the majority of subjects had long-term health benefits that lasted for seven months after treatments were initiated. There was a statistically significant increase in BMR and muscle mass in 80% of the subjects. Presumably, results were compromised in 20% of the subjects due to their high-caloric diet and inactive habitual patterns of living. Obviously, nutrition and lifestyle are important which is why 20% of the high-calorie eating, inactive subjects did not get the health benefits.

Sixty per cent (60%) of the subjects showed significant health benefits in terms of T3 and testosterone. Importantly, the level of testosterone increase in 60% of the subjects was quite robust, with females showing a 37.9% increase and males demonstrating a 166.3% testosterone increase that was maintained for seven months after treatments' onset. On the other hand, 40% of the subjects did not present any optimal fluctuations in T3 and testosterone. Eating habits and inactivity may have a greater effect on T3 and testosterone. An unhealthy lifestyle results in exacerbated inflammation, and toxicity that compromise hormonal balance and accelerate ageing by increasing metabolic age to surpass chronological age.[31]

Conclusion

Results of this longitudinal study indicate that effortless exercise has several health benefits for the majority of individuals, irrespective of their diet and lifestyle. These findings support the conclusions of previous short-term studies that used the same effortless exercise modality, verifying the hypothesis that effortless exercise has lasting health benefits for the majority of individuals despite their non-compliance with nutritional recommendations and optimal lifestyle changes. It should be noted that the sample size was small and more research is warranted with larger samples from different ethnicities. Additionally, it would be interesting to compare and contrast the results of individuals who are compliant with nutritional and lifestyle recommendations with those who are not, like the subjects in the current study, to better assess the importance of nutrition and lifestyle on health status.

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Conflicts of interest

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