The Nasal Application of Homeopathic Medicines

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Abstract

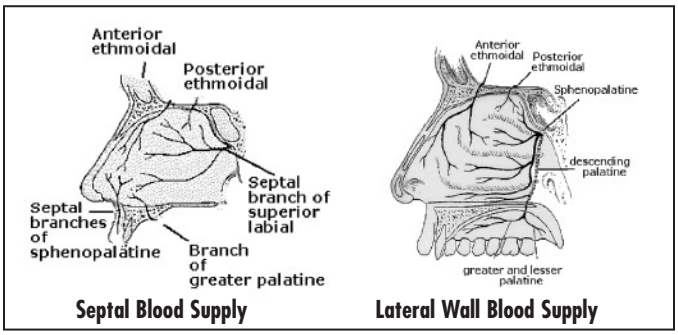
The purpose of this study is to show that, when compared to placebo, the intranasal administration of a combination homeopathic medicine is effective to control the symptoms of rhinoconjunctivitis. 42 unmedicated patients with allergic rhinoconjunctivitis were recruited. After appropriate informed consent, 7 patients were treated with a placebo of Aloe-glycerin gel without the homeopathic remedies four times a day for 1 week. 30 patients were treated with active nasal swabs as needed up to four times a day for 1 week. Those in the placebo group were then (crossed-over) treated for an additional week with the active homeopathic nasal gel swabs. 5 additional patients were treated with a sublingual mist of the same homeopathic remedy as needed up to four times a day for 1 week. Results showed a statistically significant improvement in all outcomes parameters when the active homeopathic nasal gel formula is compared to placebo. On average, Nasal symptoms improved 48%, placebo 17%. Eye symptoms improved 69%, placebo 14%. Sleep symptoms improved 48%, placebo 12%. Other symptoms improved 44%, placebo 12%. Activity impairment improved 50%, placebo 24%, and physical exam findings improved 51%, placebo 23%. Onset of effect after nasal administration of the active medication averaged 11.2 minutes. Average duration of effect of a single dose was 8.4 hours. The placebo group was compared to the active nasal swab group results using the following statistical parameters: NPar Tests, Wilcoxon Signed Ranks Test, T-Test. The Paired Samples Test results at 95% confidence level p<0.007.

Introduction

One of the earliest references to the nasal application of medicine was in the 1800's; when the first attempts at making a vaccine for the prevention of smallpox involved grinding the "scabs" from a small pox victim's skin into a powder and administering it to the nose via blowing the powder through a tube. Even then, it was recognized that people absorb things through their mucus membranes. Mucus membranes line the respiratory, digestive and urinary tracts and all medicines that aren't injected must pass through one or another. Most medications are, of course, eaten and pass through the digestive tract mucus membranes. The problem is that, if people have poor digestion, it affects their ability to absorb the medication through their membranes. Absorption of vitamin B 12 is a good example of a nutrient that can not be absorbed through digestive mucus membranes without adequate stomach acid and gastric intrinsic factor. It makes sense to look for an alternate route of medication delivery and the nose is perfectly suited for this purpose. It absorbs medication well because of its mucus membranes, nerve network, and excellent blood-supply.

Nasal Blood Supply

The nose, like the rest of the face, has an abundant blood supply. The arterial supply to the nose may be principally divided into[1] branches from the internal carotid,[2] branches from the external carotid. Veins in the nose essentially follow the arterial pattern. They are significant for their direct communication with the cavernous sinus and for their lack of valves; these features potentiate intracranial absorption.



Nasal Gel Characteristics

Nasal mucus membranes have been used to administer immunizations and allergy antigens.[1-9] It is known that the primary mechanism of allergic sensitization to inhalants is through dryness of the nasal mucosa. Repeated use of nasal sprays is irritating to the nose and solutions tend to run out of the nose or be swallowed before they can be absorbed well. It makes sense that a gel would serve to help correct the mucosal barrier defect caused by dryness. A gel also keeps any medication on the membrane longer than liquids. Aloe vera is thick and mucoid and when mixed with glycerine makes an excellent vehicle for the administration of medications to the nasal mucosa. Nasal administration of Aloe vera has been studied and showed to help allergic rhinitis. In a study by Yu, et al, ovalbumin sensitized white rats were used as animal models of allergic rhinitis. They were treated intranasally with Aloe vera. At the end of treatment the changes in the nasal mucosa were studied. Results showed that inflammatory reactions in the experimental group's nasal mucosa were remarkably relieved. It was concluded that Aloe vera is involved in the differentiation of CD4+ lymphocytes, by means of regulating the expression of Th1 and Th2 cytokines. The results suggest that intranasal Aloe vera treatment was an effective method to treat allergic rhinitis.[14]

Nasal Gel Absorption

Since homeopathic medicines are too dilute to be measured in human blood, hydroxocobalamin (vitamin B12) has been used to test the absorption of nasal gels. Van Asselt, et al, recruited 10 elderly healthy adults to study the nasal absorption of hydroxocobalamin. Blood samples were collected before administration and at 10, 20, 30, 40, 60, 120, 180 and 240 minutes after administration of either 750 or 1500 mcg of hydrocobalamin delivered via nasal spray. The maximal plasma concentration of 1900 pmol was reached in 35 minutes after 750 mcg hydroxocobalamin administration. The maximal concentration of 3500 pmol was reached at 28 minutes post-administration of 1500 mcg of hydroxocobalamin.[12]

In a study by Slot, et al, 6 patients with plasma cobalamin concentrations of < 200 ng/L were given single doses of 1500 mcg of hydroxocobalamin intranasally at days 0, 14, and 21. Plasma cobalamin concentrations were determined one hour after administration and on days 7, 21, 28 and 35. All patients showed substantial (8 fold over baseline) increases in cobalamin concentration one hour after administration. All patients showed a sustained increase 1 week after prior application.[10]

Homeopathic Medicines

Homeopathic medicines are drug products made by homeopathic pharmacies in accordance with the processes described in the ***Homeopathic Pharmacopoeia of the United States*** the official manufacturing manual recognized by the FDA. A plant substance, for example, is mixed in alcohol to obtain a tincture. One drop of the tincture is mixed with 99 drops of alcohol (to achieve a ratio of 1:100) and the mixture is strongly shaken. This shaking process is known as succussion. The final bottle is labeled as "1C." One drop of this 1C is then mixed with 100 drops of alcohol and the process is repeated to make a 2C. By the time the 3C is reached, the dilution is 1 part in 1 million! The liquid dilution is then added to distilled water or small lactose globules. The liquid or globules constitute the homeopathic medicine. Homeopathic nasal gels have not been studied.

Homeopathy and Allergies

A randomised, double blind, placebo controlled, parallel group, multi-center trial of homoeopathy versus placebo in perennial allergic was published by Taylor, et al, to test the hypothesis that homoeopathy is a placebo by examining its effect in patients with allergic rhinitis. 51 patients with perennial allergic rhinitis were recruited from four general practices and a hospital ear, nose, and throat outpatient department.

They were randomized and assigned to an oral 30c homoeopathic preparation of inhalant allergen or to placebo. Changes from baseline in nasal inspiratory peak flow and symptom scale score over third and fourth weeks after randomisation. The homoeopathy group had a significant objective improvement in nasal airflow compared with the placebo group (mean difference 19.8 l/min, 95% confidence interval 10.4 to 29.1, P=0.0001). Both groups reported improvement in symptoms, with patients taking homoeopathy reporting more improvement in all but one of the centers. On average no significant difference between the groups was seen on symptom scale scores. Initial aggravations of rhinitis symptoms were more common with homoeopathy than placebo (7 (30%) v 2 (7%), P=0.04). Addition of these results to those of three previous trials (n=253) showed a mean symptom reduction on symptom scores of 28% (10.9 mm) for homoeopathy compared with 3% (1.1 mm) for placebo (95% confidence interval 4.2 to 15.4, P=0.0007). It was concluded that the objective results reinforce earlier evidence that homoeopathic dilutions differ from placebo.[11]

Hypotheses

Nasal gel administration of homeopathic medications will ameliorate symptoms of rhinoconjunctivitis better than placebo.

Onset and duration of effect will be better than placebo.

Effect of the nasal gel will be comparable to sublingual spray of the same formula.

Research Objectives

To show that nasal gel administration of homeopathic medicines is effective at ameliorating the symptoms of rhinoconjunctivitis when compared to placebo.

To show that a combination homeopathic remedy is effective at ameliorating the symptoms of rhinoconjunctivitis when compared to placebo.

To show that nasal gel administration of the homeopathic remedy is comparable to sublingual administration of the same substance.

Materials and Methods

Entry Criteria and Treatment Protocol

42 unmedicated patients with allergic rhinoconjunctivitis were recruited. After appropriate informed consent, 7 patients were treated with a placebo of Aloe-glycerin gel without the homeopathic remedies four times a day for 1 week. 30 patients were treated with active nasal swabs as needed up to four times a day for 1 week. Those in the placebo group were then (crossed-over) treated for an additional week with the active homeopathic nasal gel swabs. 5 additional patients were treated with a sublingual mist of the same homeopathic remedy as needed up to four times a day for 1 week.

Subjective Data

The Rhinoconjunctivitis Quality of Life (RQLQ) Scale and the Work Productivity and Activity Impairment (WPAI) scales were administered before and after treatment to all participants.

Objective Data

A visual examination of nasal turbinates and transillumination of frontal and maxillary sinuses were performed pre- and post-treatment. Findings were graded as follows:

Turbinates were assigned one grade per nostril. Normal = 0, Mild Swelling = 1, Severe Swelling = 2. Maximum score = 4

Maxillary and Frontal Sinuses were assigned a grade of Normal = 0, Transillumination Deficit = 1 Maximum Score = 4

All examinations were performed by a single examiner.

Medications

All materials were prepared by Dolisos and packaged by Western Research Laboratory. The homeopathics were prepared in glycerin at Dolisos and delivered to Western Research Laboratories. The formula (see below) was mixed with Aloe vera gel and Q-tip swabs were used to administer the solution to the nasal mucosa. The placebo was prepared by Western Research Laboratories and was exactly like the active formula without the addition of the homeopathic remedy mixture. The sublingual mist was made from the undiluted Dolisos preparation packaged in a spray container. The homeopathic mixture was constructed from the highest indications for remedies listed in the reperatory and other homeopathic texts for rhinoconjunctivitis symptoms.

Homeopathic Rhinoconjunctivitis Formula

Arnica 6X, inflammation of mucus membranes
Histamine 100C antihistamine effects, allergies, asthma
Luffa officinalis 12X rhinitis, nasal inflammation
Euphorbium officinarium 4X dry, inflamed mucus membranes, sinus pressure
Hepar sulphuricum 12X burning pain in the nose, coryza
Bryonia 12X dry mucus membranes, dry cough
Mercurius iodatus flavus 12X sinus pressure and infections
Mucosa nasalis 8X nasal mucosal problems
Sabadilla 6X sneezing, congestion, watery eyes
Lemna minor 4X snoring, nasal obstruction, dryness of naso-pharynx
Lachesis 12X dry, tickling cough, breathing almost stops on falling asleep

Results

Results showed a statistically significant improvement in all outcomes parameters when the active homeopathic nasal gel formula is compared to placebo. Onset of effect after nasal administration of the active medication averaged 11.2 minutes *(Figure2)*. Average duration of effect of a single dose was 8.4 hours *(Figure3)*. On average Nasal symptoms improved 48%, placebo 17% *(Figure 4)*. Eye symptoms improved 69%, placebo 14% *(Figure 5)*. Sleep symptoms improved 48%, placebo 12% . Other symptoms improved 44%, placebo 12% *(Figure 6)*. Activity impairment improved 50%, placebo 24% *(Figure 7)*, and physical exam findings improved 51%, placebo 23% *(Figure 8)*. The placebo group was compared to the active nasal swab group results using the following statistical parameters: NPar Tests, Wilcoxon Signed Ranks Test, T-Test. The Paired Samples Test results at 95% confidence level $p<0.007$.

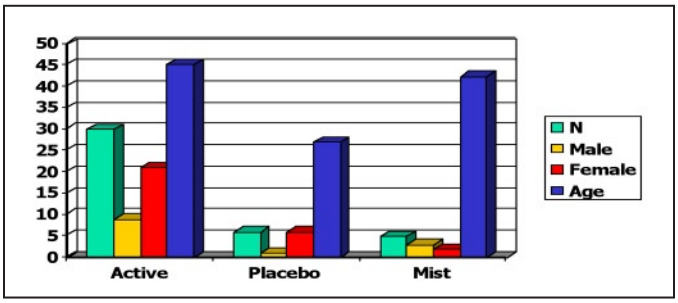


Figure 1: Demographics

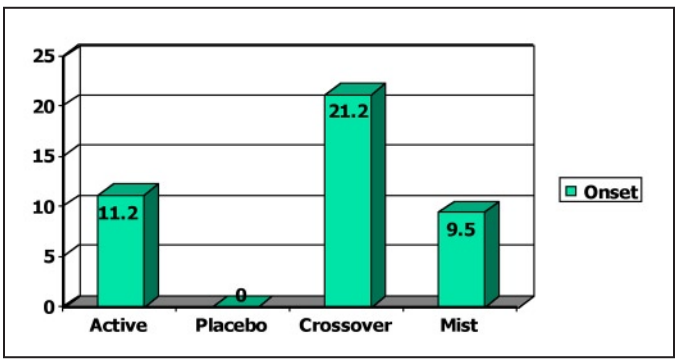


Figure 2: Pharmacokinetics onset (minutes)

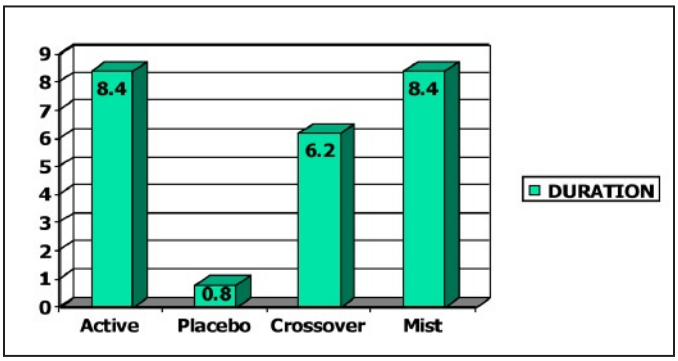


Figure 3: Pharmacokinetics duration (hours)

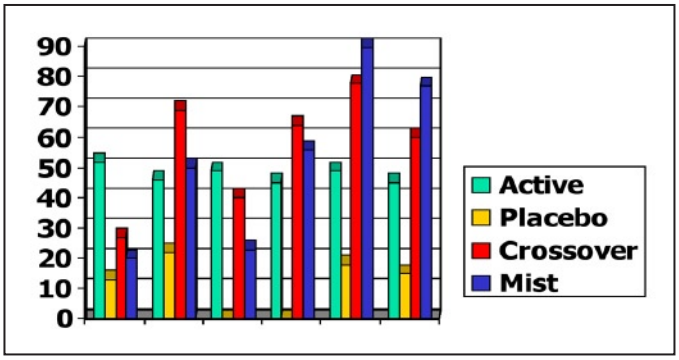


Figure 4: Nasal symptoms (% change)

Toxicity

36% of participants had mild adverse events with aggravation of symptoms (a common consequence of homeopathic treatment) affecting 14%, nasal tingling and nosebleed were also noted *(Figure 9)*.

Statistics

The placebo group was compared to the active nasal swab group results using the following statistical parameters: NPar Tests, Wilcoxon Signed Ranks Test and Student's T-Test,. The Paired Samples Test results at 95% confidence level p<0.007.

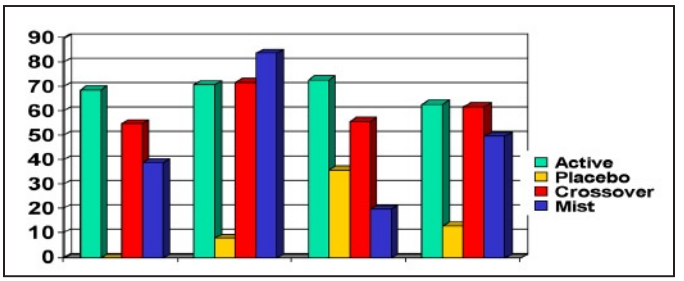


Figure 5: Eye symptoms (% change)

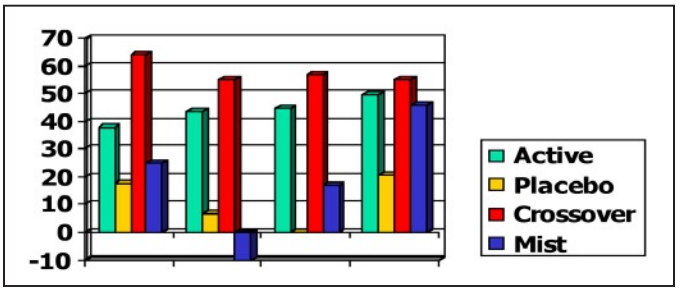


Figure 6: Other symptoms (% change)

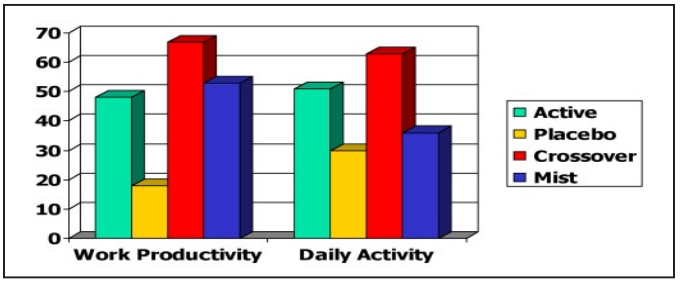


Figure 7: Activity impairment (% change)

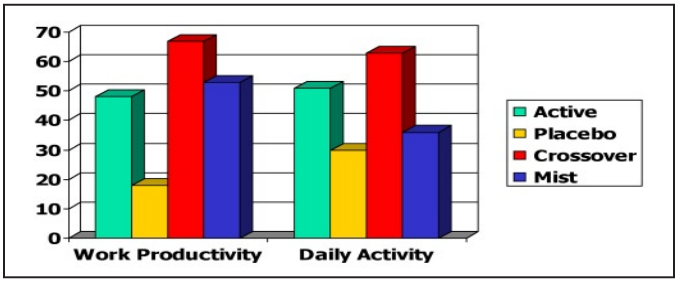


Figure 8: Physical exam changes (% change)

Nasal tingling	14%
Aggravation	14%
Nosebleed	4%
None	64%

Figure 9: Adverse effects

Conclusions

A combination homeopathic remedy is effective at ameliorating the symptoms of rhinoconjunctivitis when compared to placebo.

Nasal gel administration of homeopathic medicines is effective at ameliorating the symptoms of rhinoconjunctivitis when compared to placebo.

Nasal gel administration of the homeopathic remedy is comparable to sublingual administration of the same substance.

Toxicity is minimal, the treatment is well tolerated. The placebo had some activity due to the Aloe constituent.

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Managing Subclinical Hypothyroid Using Resting Metabolic Rate and Brachioradialis Reflexometry

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Abstract

Objective

This study looks at the risks associated with subclinical hypothyroidism and a new management paradigm that optimizes thyroid function based on Resting Metabolic Rate (RMR) and Brachioradialis Reflexometry (BR).

Design

In 563 patient interactions, volunteers were evaluated by measuring:

Thyroid symptoms, age, gender, height, weight, body mass index, calculated RMR, measured RMR, measured brachioradialis reflex intervals, and serum measurements of: TSH, T3U, T4, T7, cholesterol, LDL, HDL, and triglycerides. Some patients also had free T3, free T4, Microsomal (TPO) autoantibody, thyroglobulin autoantibody, ACTH and prolactin measurements.

Patients that were on thyroid medication received a dosage increase of the same medication. People on no medications were given a choice of thyroid treatments. All patients were evaluated at 30 day intervals and dosages were increased until the BR parameter of: Fire Interval – Pre-fire Interval < 66 was achieved.

Results

RMR calculated by the Kail Waters equation was more accurate than RMR calculated using the Harris-Benedict equation when compared to measured RMR p=0.0015 at 95% confidence level. Fire-Prefire reflex interval correlated to RMR p=0.15 at 95% confidence interval. Volunteers became functionally normal and thyroid symptoms resolved when their medication doses were titrated using RMR and BR as the primary endpoints. Only 14 of over 800 patient interactions (1.7%) noted symptoms of nervousness, tachycardia, palpitations or insomnia although TSH levels became <0.01mU/L

Key Words: *Subclinical Hypothyroid, Brachioradialis Reflex, Management, Thyroid Medication Dosage*

Introduction

Subclinical Hypothyroid and Risk Literature reviews from searches done on MedLine revealed:

Cardiovascular Risk

Several investigators have shown an increase in dyslipidemia, homocysteine, C-reactive protein, coronary artery disease, hypertension, and ischemic heart disease in people with subclinical hypothyroid.[1-11]

Several investigators have also found hypercoaguability, endothelial dysfunction, and peripheral arterial disease.[12-16] Ripoli measured decreased cardiac preload and increased afterload resulting in decreased stroke volume and cardiac output.[17]

Diabetes Risk

McCluskey showed that disruption of GLP-1 signalling affected corticosteroid and thyroid responses to stress in mice. Schultes demonstrated that in humans hypoglycemic episodes caused a decrease in TSH, free T3 and free T4 which lasted over eighteen hours after the hypoglycemia. Dessein showed that HOMA score and Triglyceride/HDL ratios increased and that subclinical hypothyroidism was associated with insulin resistance. Dimitriadis, et al showed that in hyperthyroid states post-absorptive plasma glucose and insulin increased, plasma insulin responses increased, insulin receptor binding increased due to increased receptor affinity, insulin clearance increased and maximal insulin induced glucose uptake and oxidation increased.[18-22] Risk of dysglycemia seems to be reduced with slightly hyper-thyroid function.

Arthritis and Inflammatory Risk

Dessein showed that in rheumatoid arthritis patients, subclinical hypothyroid patients had dysfunctions of glucose metabolism and insulin resistance. Innocencio showed that 52% of systemic sclerosis and 32% of rheumatoid arthritis patients also had anti-thyroglobulin and/or anti-thyroperoxidase antibodies. This finding of silent autoimmune thyroiditis may contribute to the euthyroid sick syndrome seen in people with autoimmune diseases.[20, 23]

Neurological Risk

Klein showed that Hoffman's syndrome (increased muscle mass, stiffness and weakness) was associated with hypothyroidism. Cakir showed that there was an increased frequency of Dupuytren's contracture, carpal tunnel syndrome and decreased joint mobility in people who were sub-clinically hypothyroid. Madriaga showed a polymyositis-like syndrome in hypothyroid patients. Tandeter showed an increased incidence of subclinical hypothyroidism in Parkinson's patients. Brucker-Davis showed increased hearing loss in thyroid resistant patients. Dolu showed abnormal EEG in subclinical hypothyroid patients with lower skin conductance, lower fluctuation rates and prolonged onset latencies. Several investigators have shown an association between anxiety and depression and subclinical hypothyroidism. Valpato demonstrated that in 628 women older than 65 years there was a 1.97 relative risk of cognitive decline in subclinical hypothyroid women.[24, 25 {Finsterer, 1999 #49, 26-29}30-34]

Bone

Engler showed that in subclinical hyperthyroidism there were increases in bone resorption and bone formation parameters and an increased frequency of higher urinary pyridinoline and deoxypyrodinoline excretion. Meier, et al demonstrated that in subclinical hypothyroid patients who were given L-thyroxine to restore serum thyroid measurements to the euthyroid range, there was an increase in bone resorption. Kisakol showed that in subclinical hypothyroidism there was no disturbance in calcium metabolism, but in subclinical hyperthyroidism there was increased urinary calcium excretion, increased serum osteocalcin, and increased urinary deoxypyridinoline.[35, 36]

Pregnancy

Casey recently reported a three fold increase in placenta previa and a two fold increase in premature delivery in pregnant women with subclinical hypothyroidism.[96]

Factors Affecting Thyroid Function

Peripheral Conversion of T4 to T3

Thyroid hormones are metabolized in peripheral tissues by deiodination, conjugation, deamination and decarboxylation enzyme reactions. Hepatic and renal pathology as well as stress states impact peripheral enzyme pathways. Toxic metals, chemical poisons, several drugs and nutrients may impact peripheral conversion. Vondra showed that there was a relationship between thyroid function and enzymes involved in glycolysis and cytoplasmic H2 transport from NADH2.[37]

Mitochondrial Proton Leakage

Porter showed that mitochondrial proton leakage was related to uncoupling protein 3 (UCP3). de LP, et al showed that UCP3 is regulated by T3 and causes mitochondrial uncoupling affecting RMR. Reitman showed that free fatty acids appear to regulate UCP3 expression. Yu demonstrated that in Euthyroid Sick Syndrome there is a decrease in activity of type 1 iodothyronine-5'-deiodinase (5'D-I) hepatic enzyme conversion of T4 to T3. This is believed to be a competitive inhibition by cytokines (IL-1 and IL-6). Hoch demonstrated that thyroid states regulate each cardiolipin property, and are permissive, via the proton antenna, for proton leaks. Slow leakage in liposomes may be due to insufficient cardiolipin proton antennas.[38-42]

Stressed States and Euthyroid Sick Syndrome

Schultes found that after a single episode of hypoglycemia, free T3 and free T4 were diminished and TSH increased up to 18 hours. Several investigators have found that in the Euthyroid Sick Syndrome and other stress states, that thyroid function is severely decreased.[22, 43-48]

Cytokines

Yu demonstrated that Interleukins 1 and 6 competitively inhibit the T3 induction of 5'deiodinase RNA and enzyme activity in rat hepatocytes. Nagaya, et al showed that activation of NF-kappa-B by TNF-alpha (which is elaborated in stress states) impairs T3 dependent induction of 5'deiodinase gene expression, which contributes to the Euthyroid Sick Syndrome. Rasmussen demonstrated that IL-1 alpha/beta in moderate and high concentrations reversibly inhibit thyroid cell function; while iL-1 beta in small doses stimulates thyroid cell function. This may contribute to the Euthyroid Sick Syndrome and/or autoimmune disease. The earliest stages involve antigen presenting cells interacting with the thyroid. In the later stages antigen specific and non-antigen specific immune cells are recruited to the thyroid and an inflammatory infiltrate is built. During this process cytokines, free nitric and oxygen radicals are released. Ren showed that Leukemia inhibitory factor (LIF), a neuroimmune pleiotropic cytokine is produced in the thyroid gland. TSH, IL-6, and glucocorticoid influence thyroid cell LIF expression. Kimur showed that IL-6 and IL-10 significantly correlated with TSH in acute MI patients that developed Euthyroid Sick Syndrome. Bagriacik demonstrated that serum T3 and T4 levels are sharply and transiently reduced during the first 24 hrs following systemic antigen exposure. These findings suggest that during the early phase of antigen exposure the immune system directly participates in the regulatory control of thyroid hormone activity.[49-55]

Nutrients

Barrows showed that very low carbohydrate diets caused decreases in RMR, T3, and RT3 without affecting T4. Mathieson found that although dietary carbohydrate content had an influence on the magnitude of fall of serum T3, RMR declined similarly in both high and low CHO diets. Poehlman showed that there was a slight, but insignificant decline in T3 in vegetarians versus non-vegetarians. Dubois and Goldman could demonstrate no effect of hypothyroid on gastric secretion and emptying. Poehlman showed that acute exercise and caffeine ingestion had no effect on thyroid function.

Berger, et al showed that selenium supplementation had moderate effects on thyroid function with a quicker recovery in Euthyroid Sick patients although zinc and alpha tocopherol had no effect. Iron supplementation seems to increase RMR and thyroxine levels, as does zinc in iron/zinc deficient individuals but had no effect in iron/zinc sufficient. Clark showed that administration of kelp caused a significant and dose related increase in TSH and decrease in T3 and T4. Other sources of iodine performed similarly. In iodine deficient populations, supplementation of iodine improved thyroid function, but it reduces thyroid function in people who have adequate iodine. Benvenga showed that l-carnitine decreases thyroid function by preventing its entry into the nucleus of cells, which improves bone resorption in hyperthyroid individuals.[11, 56-66]

Environmental Toxins

Rat studies by several investigators showed that PCB exposure resulted in severely decreased serum T4 and moderate decreases in serum T3. Tomasi showed that in rats exposed to fungicides there was a decrease in thyroid hormone and that there was a corresponding increase in T3 turn-over. Pelletier proposed that organochlorine pesticide residues residing in adipose tissue would be released and cause a decrease in thyroid function in obese individuals during weight loss programs. Garry studied pesticide applicators and found subclinical hypothyroidism in 5/144. Guven found that 31.8% of patients who had been poisoned by organochlorines had Euthyroid Sick Syndrome.[67-75]

Medications

Several authors have shown that seizure medications and lithium reduce thyroid function. Amiodorone has been implicated in thyroid dysfunction. Wang showed that a single dose of salsalate caused a decrease of T3 and T4 as well as an increase in reverse T3 which lasted up to 96 hrs. It was concluded that there was an acute release of T4 and T3 from circulatory transport proteins induced by an inhibitor of binding. This resulted in a large and rapid redistribution of T4 and T3 into tissue compartments associated with transiently reduced peripheral tissue 5'monodeiodination and deranged TSH regulation.[76]

Physiological Measurements Related to Thyroid Function

Many investigators have used either estimations of resting energy expenditure such as the Harris-Benedict equation or direct measurements of resting metabolic rate to look at energy expenditure and energy requirements in a variety of populations. Many authors have demonstrated decrease in RMR with age and decreased thyroid function. Vondra showed the relationship between thyroid function and enzymes involved in glycolysis and hydrogen transport from NADH2, correlating achilles tendon reflexes and thyroid function. Khurana, Carel, Goodman and others have demonstrated statistically significant correlations between achilles tendon reflexes and thyroid function. Goulis demonstrated a similar effect using stapedial reflex. Findings have been consistent in a slowing of the firing interval of the reflex with decrease in thyroid function and a corresponding return to normal with treatment by thyroid medication. Body mass index and other physical markers seem to correlate. Being female and increasing age have shown correlations with thyroid dysfunction.[40, 77-87]

Serum Thyroid Tests

Scobbo showed great variability in serum TSH depending on time of day samples were drawn and if the subject was fasted. Stockigt, et al showed that there was no current methodology that accurately reflects the free T4 in undiluted serum.[88-90]

Risk Associated with Hyperthyroidism

Gussakoo found no correlation between plasma thyrotropin or free thyroxine in elderly patients with depression or cognitive dysfunction, but found that increased thyrotropin was correlated with increased longevity. Kisakol and others found that subclinical ***hyperthyroidism*** was associated with increased bone resorption, increased quality of life, increased lean body mass, increased functionality and increased longevity.[91, 92]

Materials and Methods

After suitable informed consent, volunteers were evaluated for thyroid status using:

A standardized Thyroid Symptom Questionnaire

- Height and weight were measured on a standard clinic scale.
- RMR was predicted using the Harris-Benedict Equation.
- RMR was measured using the MedGem oxygen consumption device, which compared favorably to the Douglas Bag in clinical trials.[93-95]

Brachioradialis reflex was measured using a prototype reflexometer designed by Noraxon Corporation, manufacturers of electromyogram equipment. The device was interfaced with a standard IBM compatible PC and proprietary software produced by Noraxon. *(Figure 1).*

Figure 1: Brachioradialis Reflexometer

Reflex measurements included: Pre-Firing Interval defined as the number of milliseconds from hammer strike to initiation of the reflex response; Firing Interval defined as the number of milliseconds from initiation of the reflex firing until return to baseline; and Fire-PreFire which is the difference in milliseconds between those intervals *(Figure 2)*.

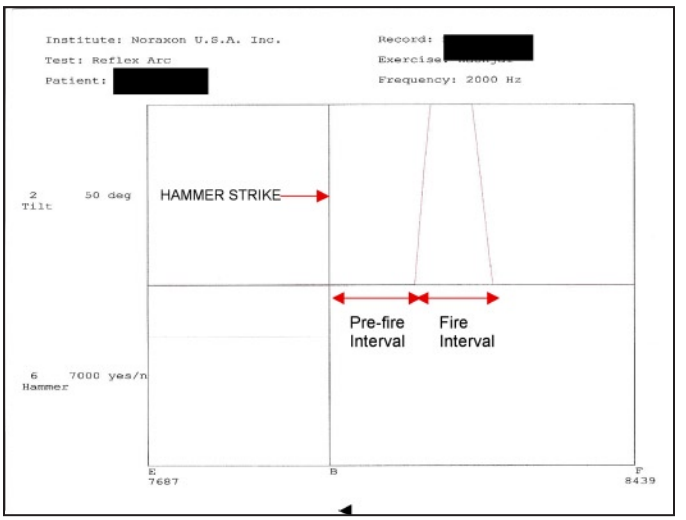

Figure 2: Brachioradialis Reflex Recording

Fasting serum specimens were collected for TSH, T3U, T4, T7 Cholesterol, LDL, HDL, and Triglycerides. Some volunteers received free T3, free T4, RT3, TRH, Thyroid Microsomal (TPO) auto-antibody, Thyroglobulin auto-antibody, ACTH and Prolactin measurements. All serum measurements were collected in our clinic and processed at Sonora-Quest laboratories. All serum measurements reflect their technique and norms.

All measurements were made at baseline and 30 day intervals. Volunteers already on thyroid medication continued it. Volunteers on no medication were given the choice between :

- Homeopathic Thyroid Formula
- Thyroid nutritional co-factors without tissue
- Thyroid Tissue OTC
- Prescription natural thyroid (Armour, Westhroid, Naturethroid)
- Prescription Synthetic Thyroid (Cytomel, Liothyronine, L-thyroxine, Synthroid)

Doses of thyroid medication were increased until the reflex parameter of: ***Fire –PreFire < 66 was achieved.***

Results

Focusing on which factors are the best predictors of the dependent variable Resting Metabolic Rate (RMR), a step-wise Multiple Linear Regression Analysis (MLRA) was the analytical method used on a population of 563 patient encounters (N=563). After analysis of the independent variables with MLRA, it was determined that Patient Height (CM), Patient Weight (KG), Body Mass Index (BMI), PREFIRE, FIRE, and FIRE-PREFI (Fire minus Prefire) were the best predictors of the dependent variable (RMR). Note: Refer to text on how PREFIRE and FIRE was computed.

In *Table 1*, an acceptable Multiple R value indicates approximated 65% of all variation is accounted for with the predictive equation being:

RMR = 2307.62 + [-7.53(CM)] + [27.09(KG)] + [-42.59(BMI)] + [-45.47(PREFIRE)] + [45.85(FIRE)] + [-46.27(FIRE-PREFI)]

***Table 1:* Regression Summary Table**

Dependent Variable: RMR (N=563)

Multiple R=.6523, Std. Err. Est.=316.87, F=68.62

Ind Var	B Coef	Std Err(B)	t-value	Prob.
CM	-7.53	5.51	-1.37	.1722
KG	27.09	5.59	4.85	<.0001
BMI	-42.59	15.92	-2.67	.0077
PREFIRE	-45.47	31.88	-1.43	.1544
FIRE	45.85	31.85	1.44	.1506
FIRE-PREFI	-46.27	31.84	-1.45	.15

Constant: 2307.62

Verification of the predictability of the equation was checked by computing a CRMR (Computed RMR) with the equation for all patient encounters, and statistically comparing CRMR with RMR using a Student t-test with a pooled variance.

Ho: u1 = u2 and Ha: u1 ≠ u2

Based on the t-value in *Table 2*, the Ho is accepted with u1 = u2 or the mean of CRMR is statistically the same as the mean of RMR with a non-significant 2-tailed probability of p = .9985 giving relatively high credibility to the predictive equation.

***Table 2:* Student t-test**

Separate Group Statistics		
Group:	RMR	CRMR
Size: (N)	563	563
Mean:	1913.87	1913.83
SD:	413.80	270.55
St. Err:	17.44	11.40
Group Mean Differences		
Mean Diff:	0.04	
St. Err of Diff	20.84	
Lower 95% CI	-40.85	
Upper 95% CI	40.93	
Test of Equality of Means		
t-value:	.0019	
df:	969.67	
2-tailed Prob:	.9985	

Analysis of Thyroid Stimulating Hormone (TSH) with RMR, PREFIRE, FIRE, FIRE-PREFIRE

A common medical practice is to use quantitative serum TSH levels as a basis for the treatment of thyroid pathologies. This supposition may not be correct. Using a Factor Analysis (Principal Components Analysis), it appears that TSH may not be as closely associated with RMR as might be expected. The following data suggest that TSH has relatively independent variation compared to the other selected variables in this study. *(Figure 3)*

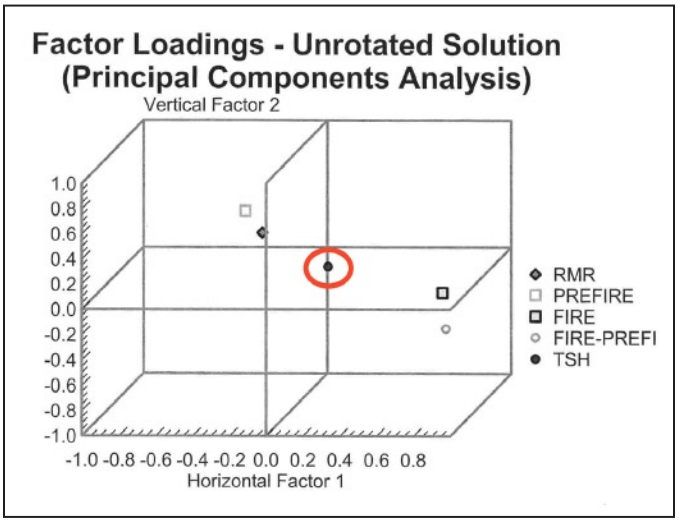

Figure 3

Response to Treatment

Symptoms and Physiologic Measurements

Thyroid symptoms decreased as thyroid function improved. Physiologic measurements responded to treatment as expected. BMI decreased, BBT increased as thyroid function improved. All therapeutic regimens raised RMR, except the preparation containing kelp. *(Figure 4)* All therapeutic regimens improved BR measurements showing that as thyroid function improved, the PREFIRE interval became longer and the FIRE interval and PREFIRE-FIRE became shorter. BR treatment target was FIRE-PREFIRE @ 66 milliseconds. *(Figure 5)*

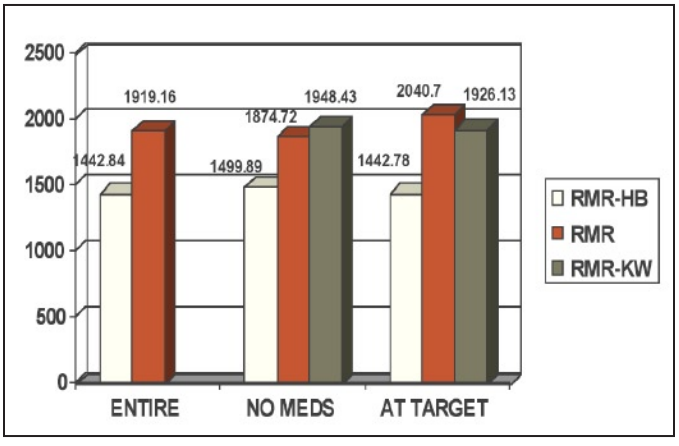

Figure 4: Predicted vs Measured RMR

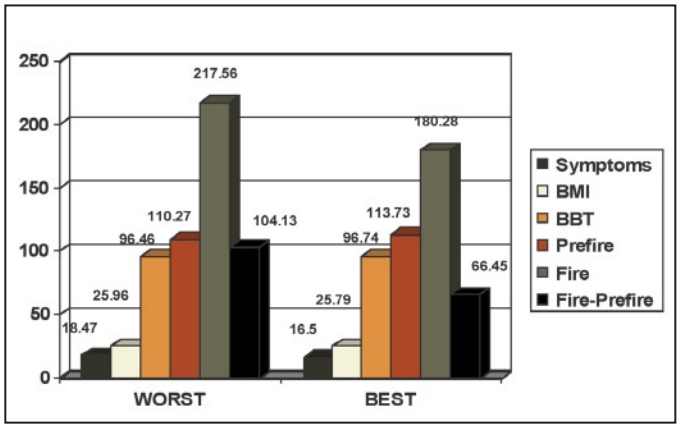

Figure 5: Worst to Best

Serum Measurements

TSH became small (<0.3 mU/L), when RMR increased only 183 calories. Symptoms normalized when BR reached target level (FIRE-PREFIRE < 66 msecs). At that point RMR was >355 kcal above baseline *(Figure 6)*. Free T3 became high, but other serum thyroid measurements remained normal. *(Figures 7, 8)* Serum cholesterol, LDL, and triglycerides were reduced by treatment with thyroid medication compared to baseline values. HDL increased. *(Figure 9)*

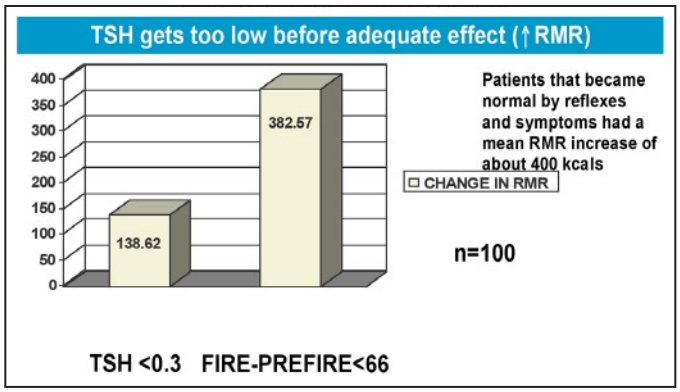

Figure 6: Why TSH does not identify those at risk!!

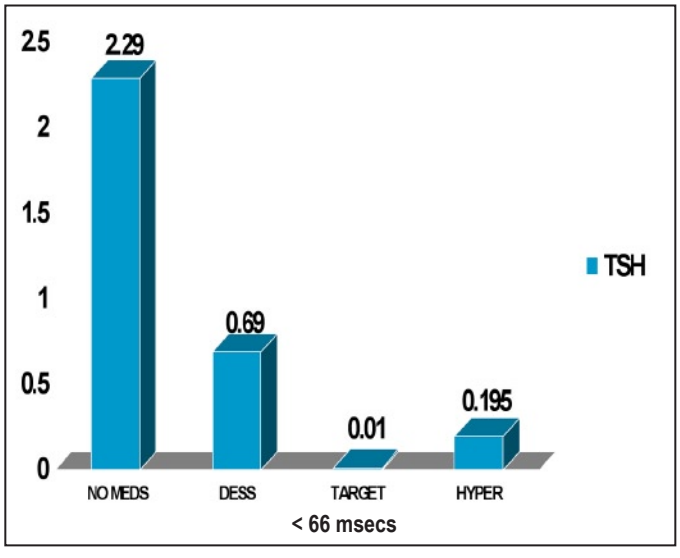

Figure 7: TSH

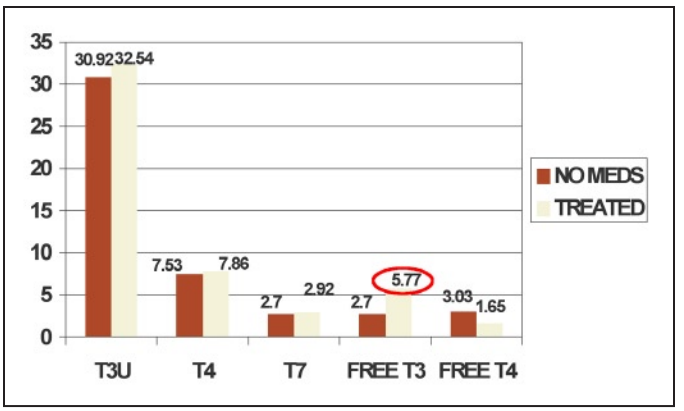

Figure 8: At Target (Fire-Prefire < 66)

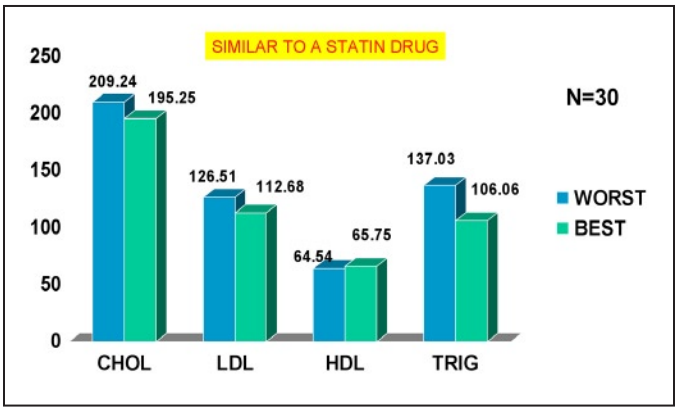

Figure 9: Thyroid effects on serum lipids

Discussion

Clinical investigators have long recognized that there was a discrepancy in reconciling patient's symptoms and serum measurements of thyroid function. We started this case series to find out which parameters were the best clinical markers to use in identifying and managing subclinically hypothyroid patients. Our hypothesis was that physiological measurements of thyroid function were better indicators of functional status than serum measurements, and that many subclinically hypothyroid patients were not receiving adequate treatment. Statistics on the collected data support the hypothesis. We believe that the unaccounted variance comes from stress events that occurred between measurement intervals that affected thyroid function.

Results:

RMR calculated by the Kail Waters equation was more accurate than RMR calculated using the Harris-Benedict equation when compared to measured RMR p=0.0015 at 95% confidence level. Fire-Prefire reflex interval correlated to RMR p=0.15 at 95% confidence interval. Volunteers became functionally normal and thyroid symptoms resolved when their medication doses were titrated using RMR and BR as the primary endpoints. Only 14 of over 800 patient interactions (1.7%) noted symptoms of nervousness, tachycardia, palpitations or insomnia although TSH levels became <0.01mU/L.

Conclusions

Subclinical Hypothyroidism appears to greatly affect the patient's health risk of many chronic degenerative diseases. We believe that it is essential to treat this syndrome. In this population, the evidence supports the hypothesis that physiologic measurements of thyroid function are more accurate at identifying the subclinical hypothyroid state than serum measurements. Volunteers became functionally normal and thyroid symptoms resolved when their medication doses were titrated using RMR and BR as the primary endpoints. Only 14 of over 800 patient interactions (1.7%) noted symptoms of nervousness, tachycardia, palpitations or insomnia although TSH levels became <0.01mU/L. *(Figure 9)*

Authors' Contributions

Dr. Kail designed and carried out the clinical trial. The data was statistically evaluated and reported by Dr. Waters.

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The Correlation of Electrodermal Conductance of Acupuncture Points to Thyroid Function and Hashimoto's Disease

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Abstract

The purpose of this study is to show that, electrodermal measurements of conductance at acupuncture (Voll) points TW2 and Al1b correlate to thyroid function and Hashimoto's disease. 110 patients with thyroid dysfunction were recruited. After appropriate informed consent, a thyroid symptom survey was administered as well as measurements of axillary basal temperatures (BBT) and body mass index (BMI). Conductance measurements were made of points Tw2 and Al3a. Serum measurements of TSH, T3U, T4, T7, Free T3 and FreeT4 were made as well as TPO antibodies and Thyroglobulin antibodies in anyone suspected of having Hashimoto's Disease. Brachioradialis reflex was measured using a Thyroflex™ device and resting metabolic rate was calculated using the Kail-Waters equation RMR = 2307.62 + [-7.53(CM)] + [27.09(KG)] + [-42.59 (BMI)] + [-45.47(PREFIRE)] + [45.85(FIRE)] + [-46.27(FIRE-PREFIRE)]. Volunteers that were hypothyroid by symptoms and reflexes were treated with dessicated thyroid starting at 1 grain (65 mg) per day with re-evaluations and dosage adjustment every 30 days until reflexes and symptoms normalized. People found to have Hashimoto's had their medication switched from dessicated to synthetic or visa versa.

Results

Comparing unmedicated volunteers to themselves after treatment; parameters changed as expected. Peak values of TW2 and Al3a didn't change much. Indicator drops changed from abnormal (>2) to normal (≤2) p<0.001. Symptoms and reflexes were better indicators of thyroid dysfunction and Hashimoto's than TSH values p=0.25. People that were treated for their Hashimoto's (medication switch) showed increasing thyroid function by RMR, reflexes and TSH within 30 days; although, antibody levels would still be elevated. This would indicate that the antibody could not "recognize" the new medication and did not complex with it, allowing more hormone to reach the receptor site.

Introduction

The conductance (1/Ω) of acupuncture points varies and correlates with physiological/pathogenic changes in the body. The fact that change in the electrical field precedes morphologic change, and manipulation of the electrical field can affect the change, may shed light on the diagnosis and treatment of many diseases.[1] In the 1950s, electrodermal screening methodologies were developed by acupuncturists in various countries in an effort to find inexpensive objective measurement of the changes observed in patients receiving acupuncture therapies. Electroacupuncture according to Voll (EAV) is the most versatile, precise, codified, and studied of the methods developed. Dr. Voll and others have gathered clinical data suggesting that electrical conductance measurements taken at low resistance points on the body can be correlated to the bio-energetic functional status of specific organs and tissue systems.[4] Many of the low resistance measurement points correlate with classical acupuncture points. It has been observed that pathological disturbances of organ function established by conventional medical diagnostic procedures are frequently reflected by disturbed skin conduction values at corresponding points suggested by acupuncture theory.[5, 6, 7] An abnormal measurement at a point should therefore be suggestive of a functional disturbance associated with its corresponding organ or system.

The electrodermal screening device (EDSD) is an ohmmeter designed to deliver approximately 10-12 µa (microampere) DC at 1-1.25 v, through a probe or electromagnetic coil. The signal is below the level of human sensation. On the majority of devices the meter is calibrated to read from 0-100 1/Ω (conductance units), such that the standard skin resistance of 100 mΩ reads 50 1/Ω. The minimum value of zero represents infinite resistance (no electrical conductivity), and the maximum value of 100 µa, zero resistance at the given voltage and current.[8]

A reading taken with the EDSD is usually described using two values, the initial reading (peak) and the indicator drop (ID). A peak reading of about 50 µa with ID<2 is considered to be balanced. When an indicator drop is present, it is considered the most significant part of the reading. The peak reading is primarily an expression of energy, while the ID and its manipulation through medicine testing is primarily an expression of bio-information.

Peak readings are normal from 50- 65 and indicator drops are significant if > 2.

Molecular configurations (electromagnetic spectrum) can be captured as an analog signal, then digitalized and stored in a computer through use of an analog-to-digital converter. That molecular configuration can then be stored and later recalled in its analog form and put out through the EDSD probe as a challenge to a specific acupuncture point to generate a response that can be read by the device. When a substance, such as a medicine sample, is put on the aluminum plate in the EDSD circuit, the electron waves passing through the plate will be phase-modulated. When the waves later pass through the patient's body, a given signal is transported to the proper organ or tissue by resonant absorption. The signal waves mix with the local electron waves resident in organs or tissues according to the principle of superposition. Both the phase-modulated electron waves emitted by the EDSD and the electron-distribution waves existing within the body must have similar and approximately equal phase spectra, excluding their DC component.[10]

This is quasi-phase matching between two electron wave groups. It is impossible to find a medicine which has a phase characteristic spectrum identical to the disease, only similar ones. This principle holds true for all types of medicine: botanical, nutritional, chemical, natural, or synthetic. The basis has been established for a challenge mechanism where specific substances can be tested against specific acupuncture points. The challenge will elicit findings to show that the energy of some substances will balance the energy of the acupuncture point (therapeutic), and the energy of other substances will imbalance the energy of the acupuncture point (adverse).

Eisenberg's survey found that 3.4% of Americans have used homeopathy.[14] The scientific literature on homeopathy is still not conclusive, showing positive and negative evidence in meta-analysis of clinical trials.[16, 17] Reviews of placebo-controlled trials demonstrate that the majority are positive studies,[18, 19] and to have more effect when compared to placebo and conventional treatments.[15] Benveniste provided potential evidence supporting biological activity of diluted remedies in controversial studies showing inhibition of basophil degranulation with *Apis mellifica*[20] and peritoneal macrophage activity with high dilutions of silica.[21] Later studies showed more conclusive evidence supporting homeopathic remedies using a similar model of basophil degranulation,[22, 23] lung histamine ,[22] and histamine.[24, 25]

Electrical conductance models of "imprinting" remedies on computers have been reported,[26, 27] and transatlantic transfer of digitized antigen signals by internet link was shown to mimic the activity of the source molecule by Aissa in 1997.[28] Non-diluted samples (actual substances) have been shown to be digitally transferred suggesting that electromagnetic molecular signals can be recorded and generate a biological response.[29, 30] Benveniste's experiments with guinea pig hearts and water that has been "imprinted" using amplifier and electric currents (histamine and ovalbumin) showed increasing coronary flow.[31, 32, 33, 34] Voll's approach to assessment and treatment demonstrate its potential use in health care.[38, 39, 40]

A schematic of a typical EDS configuration is shown in *Figure 1*.

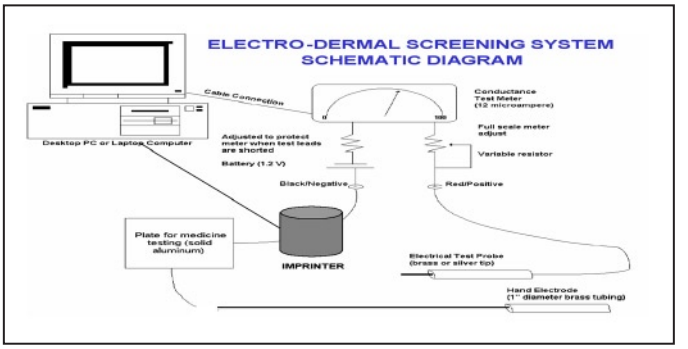

Figure 1

Hypotheses

Conductance measurements of acupoint TW2 correlate with thyroid function.

Conductance measurements of acupoint Al3a correlate with Hashimoto's disease.

Research Objectives

To demonstrate that thyroid dysfunction and presence of Hashimoto's disease can be accurately diagnosed by electrodermal conductance measurement of acupoints TW2 and AL3a.

Materials and Methods

Entry Criteria and Treatment Protocol

Adults on no medication with high (≥12) thyroid symptom scores and low (<97.5° axillary) BBT's.

Subjective Data

The Thyroid Symptom Survey was used to track hypo – and hyperthyroid symptoms. A score of 8-12 on the hypothyroid scale is borderline while scores ≥ 12 are suggestive of hypothyroid status. Any hyperthyroid symptoms are significant.

Objective Data

All conductance measurements were made by a single operator on a single EDMED™ electrodermal screening device. All reflex measurements and calculations of resting metabolic rate were performed on a single Thyroflex™ device. Normal ranges for reflex intervals are Prefire: 70.43-155.87 msecs; Fire: 152.96-273.56 msecs; Fire-Prefire: 51.61-148.55.The Fire-Prefire correlates best with resting metabolic rate (RMR) and thyroid function. Serum thyroid tests were all performed by Sonora Quest Labs and reflect their norms.

Medications

Naturethroid™,a dessicated thyroid product manufactured by Western Research Laboratories, was used to treat patients that were determined to be hypothyroid by symptoms and reflexes. This agent contains exactly the constituency of hormones as Armour thyroid™ without additives and excipients. People found to have Hashimoto's disease had their thyroid medication switched at equivalent dose from dessicated to synthetic or visa versa.

Results

Comparing unmedicated volunteers to themselves before and after treatment; parameters changed as expected. Peak values of TW2 and Al3a didn't change much. Indicator drops changed from abnormal (>2) to normal (≤2). Symptoms and reflexes were better indicators of thyroid dysfunction and Hashimoto's than TSH values. People that were normal by TSH showed a persistent indicator drop on TW2.

People that were treated for their Hashimoto's (medication switch) showed increasing thyroid function by RMR, reflexes and TSH within 30 days; although, antibody levels would still be elevated. This would indicate that the antibody could not "recognize" the new medication and did not complex with it, allowing more hormone to reach the receptor site.

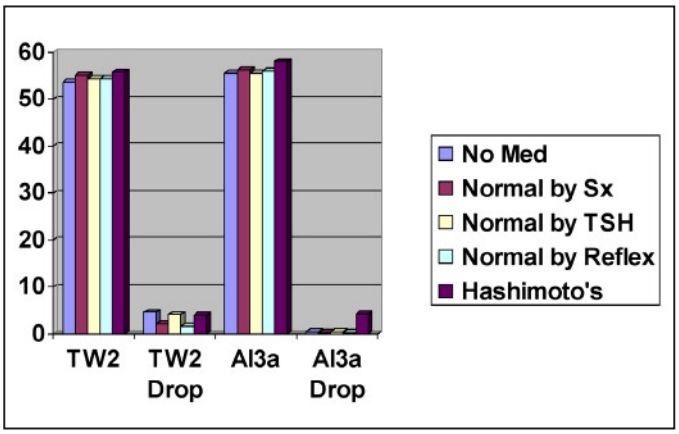

Figure 2

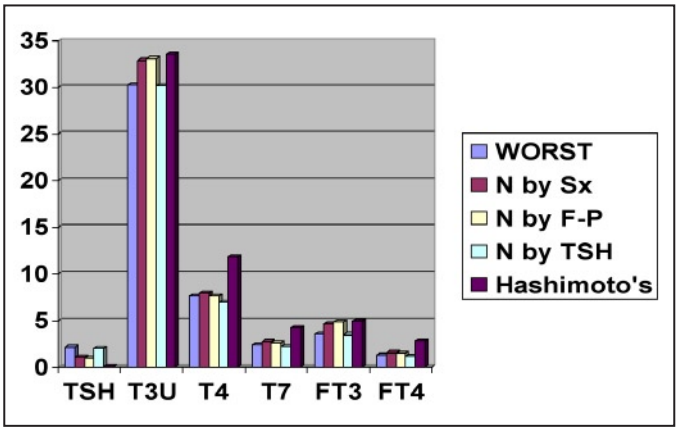

Figure 3

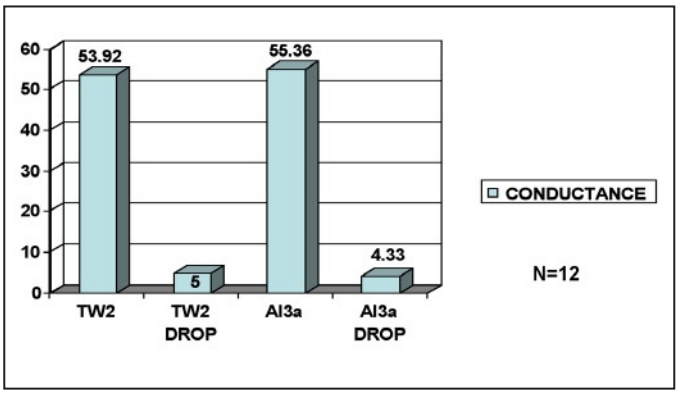

Figure 4: Point conductance and Hashimoto's

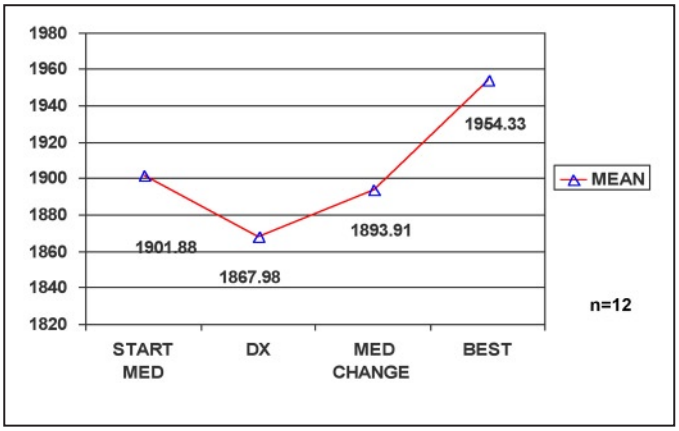

Figure 5: Hashimoto's and RMR

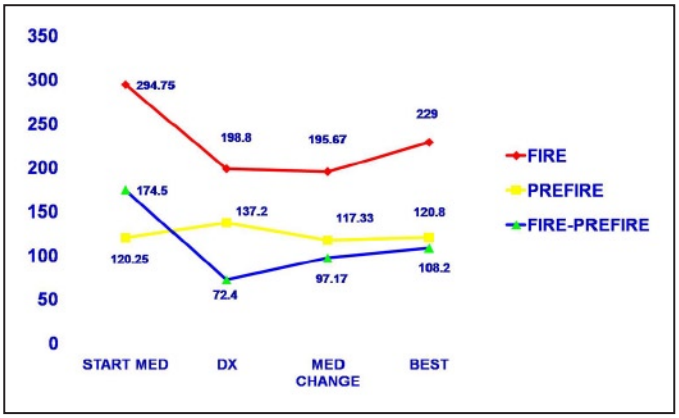

Figure 6: Reflexes and Hashimoto's

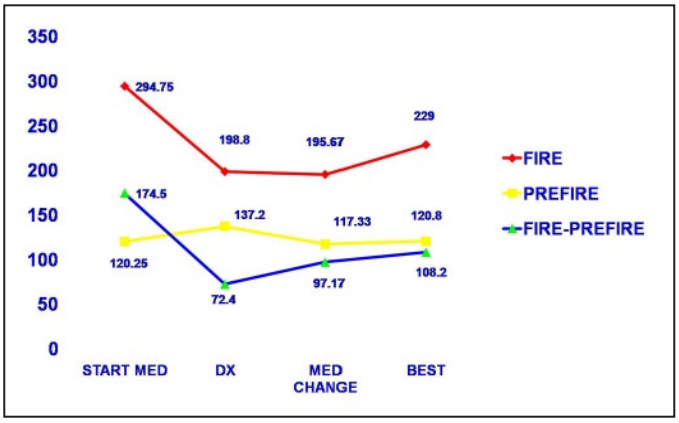

Figure 7: Hashimoto's and TSH

Statistics

Unpaired Student's T-Test was performed on the data. At the 95% confidence level comparing patient data before treatment to after in the same patient showed: that Peak TW2 values p=0.042; TW2 indicator drop levels p<0.0001; peak Al3a levels p=0.0002; Al3a indicator drop levels p=0.053; Prefire reflex interval p=0.009; Fire reflex interval p<0.0001; Fire–Prefire p<0.0001; RMR-KW p=0.31 TSH p<0.0001; and TSH correlated with Fire-Prefire reflex interval.p<0.001.

In volunteers with Hashimoto's the Unpaired Student's T Test at the 95% confidence level before and after treatment showed that TSH was not a good indicator of Hashimoto's p=0.25, Fire-Prefire reflex interval was significant p=0.023; TPO antibody correlated to AL3a peak point conductance measurement p=0.031; and TPO antibody to Al3a indicator drop p=0.007; TBG antibody correlated to peak AL3a conductance measurement p=0.54 and to Al3a indicator drop p= 0.16.

Conclusions

Conductance measurement of Voll Acupoints Al3a and TW2 are an accurate and reproducible method of diagnosing hypothyroid conditions and Hashimoto's Disease.

Conductance measurement of Voll acupoints TW2 and Al3a correlated very well with thyroid function as assessed by serum or physiological parameters. Energy changes first in a pathological process. This may introduce a confounder in that changes measured by energy may not have advanced far enough to be measured by biochemical means. This did not seem to interfere with correlations of serum to energy.

In Hashimoto's patients Al3a conductance Indicator drop correlated the best with antibodies. We did find that physiological measurements (symptoms, BBT, RMR and reflexes) correlated better than serum tests of thyroid function in Hashimoto's patients.

Acknowledgements

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