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**THYROID DYSFUNCTION
AND
CONSERVATIVE TREATMENT OPTIONS**

A LITERATURE REVIEW

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ABSTRACT

Objective:

The purpose of this paper is to review literature published on thyroid dysfunction, pathophysiology, diagnosis, and treatment options of the dysfunction. The difficulty that arises with treatment of thyroid disorders is frequently removal of the thyroid gland, necessitating subsequent pharmaceutical thyroid hormone replacement. Although removal of the thyroid gland may be indicated in malignant conditions, there are likewise non-malignant conditions that may benefit from alternative treatment options of chiropractic adjustments and care, immune system strengthening, accupuncture, accupressure, reflexology, self hypnotic relaxation exercises, and nutrition as alternatives to traditional surgery and pharmacologic hormone replacement therapy, thereby eliminating the cause of the dysfunction. The status of the immune system will be improved and thus the condition of the thyroid gland.

Data Source:

The searches for this literature review were obtained in part from the *Medline Data Base*, and in the chiropractic data base in the Logan College Library. In addition, the *Medline Data Base* of Washington University Medical Library was researched.

Many searches were performed with the key words of thyroid gland, exercise, immune system, hyperthyroid and hypothyroid, stress and the thyroid, thyroid, endocrine, detoxification, thyroid cyst, thyroid nodule, acupuncture, accupressure, reflexology, and healing.

With the assistance of Logan's Learning Research Center's director, Bob Snyders, the many literature searches for relevant articles published in the past ten to fifteen years in English language medical journals, review of selected articles published before this time period, and review of textbooks was undertaken. There were studies that included autopsy findings, ultrasonographic studies and reports on nonpalpable

findings, the natural history of thyroid nodules and malignancy in cases of irradiated thyroid glands reviewed. Thyroid-pituitary-axis and the immune system was also researched.

Conclusion:

Following review of the current literature for treatment of thyroid dysfunction through surgical intervention and pharmacological supplementation of thyroid medications, it is apparent that the underlying cause of the thyroid dysfunction was not specifically addressed. It is imperative that the body's immune system and its health become a primary defense and prevention of the dysfunction, in an attempt to pursue the healing of the body through its own innate ability.

Introduction

The most common cause of thyroid disorders worldwide is iodine deficiency leading to goiter formation and hyperthyroidism. In areas not deficient in iodine, autoimmune processes are believed to be the basis for most cases of thyroid diseases ranging from hyperthyroidism to hypothyroidism.

Numerous people, particularly older women in any community have asymptomatic autoimmune thyroiditis on the evidence of circulating thyroid antibodies with normal thyroid function.(27)

Early criteria of a goiter allowed for a normal visible thyroid, but the most widely adopted criteria are those of Perez and associates who defined a goiter as "a thyroid whose lateral lobe have a volume greater than the terminal phalanges of the thumb of the person being examined." (22) A palpable and visible thyroid is almost always defined as a goiter.

The normal thyroid gland is a bilobed structure, usually with a connective isthmus, with right lobe frequently larger than the left. The thyroid capsule contains sizable venous channels that became strikingly visible when vascularity is increased. "The normal gland is soft and yellowish red, and the cut surfaces are glistening and translucent because of the colloid contained within. Normal weight of the thyroid varies with normal limits between 10g to 60g with an average weight of 10-20g.(27)

The function unit of the thyroid is the follicle, an oval or round sac lined with low cuboidal epithelium and the follicular lumen contains colloid composed of glycoprotein thyroglobulin. The follicle averages 200um in diameter and the thyroid lobule can consist of 20 to 40 follicles bound together by a thin sheath of connective tissue supplied by a lobular artery (15).

It has been noted that "the thyroglossal tract extends in the midline from the foramen cecum at the base of the tongue to the isthmus of the normal gland. The tract consists of connective tissue, the thyroglossal duct, lymphoid tissue and thyroid follicles; it is attached to and may extend through the center of the hyoid bone and is intimately related to the surrounding skeletal muscle." (27)

Since the thyroglossal duct is typically a "discontinuous tube lined with ciliated pseudo stratified columnar epithelium," if the duct becomes traumatized or infected, the epithelium may then be transitional or squamous type or be lost and replaced by fibrous tissue (27). An inflammation may result and if fluid accumulates in part of the thyroglossal duct, a thyroglossal cyst may develop, reaching an extremely large size if neglected. These are usually found in children and adolescents but may also be seen in adults. Due to the extent of the thyroglossal tract, if surgery is chosen to remove the thyroglossal cyst, the entire tract from the base of the tongue to the isthmus of the gland must be removed (27).

HYPERPLASIA

Any mechanism that causes excess thyrotropin to reach the thyroid gland or any substance that activates the same cellular sites as thyrotropin is termed Hyperplasia. This can be accomplished by primary pituitary disorders, errors of thyroid hormone metabolism, or iodine deficiency. Grave's disease is synonymous with primary hyperthyroidism and toxic diffuse goiter. This causes an increase in size, number and cell activity, as well as increased follicular size with loss of colloid.(27)

THYROIDITIS

Autoimmune Thyroiditis is a common disorder in women that encompasses symptoms of moderate hyperthyroidism to severe hypothyroidism, from a large goiter to an atrophic gland from infiltrating lymphocytes and reduced colloid, or it may have no signs and symptoms. Other forms of thyroiditis include acute suppurative, granulomatous thyroiditis, and painless thyroiditis which can be suspect for neoplasm.(14)

GOITER

Goiter refers to a thyroid gland enlarged as a result of a benign process, a process of unknown origin or a malignant process. A deficiency in iodine in the diet is

the most common cause for a deficiency in thyroid hormone output. In addition, there may be errors in thyroid metabolism.

There are three stages of simple non-toxic goiter: 1) Hyperplasia, 2) colloid accumulation, and 3) Nodularity. The initial stage of hyperplasia is the response of the thyroid to decreased thyroid hormone. In the initial stage, iodine deficiency alone is usually not sufficient to produce as marked hyperplasia as inborn errors of metabolism do (27). With the process continuing, the second stage develops where many of the follicles undergo involution and accumulate colloid. When the follicles become much larger than normal, are filled with colloid and undergo epithelium changes "exhaustion atrophy" has taken place. Although the gland is still not nodular, it is soft, filled with colloid and considered non-toxic colloid goiter. As fibrosis and degeneration take place and hyperplasia continues nodularity takes place. This is known as nodular goiter or adenomatous goiter. These changes explain the course of thyroid disorders accompanied by inadequate circulating thyroid hormone (27).

Due to factors such as replication of follicular cells responding to outside stimuli, and rate of growth, the groups of cells that are hyperfunctional or autonomous are termed "hot" nodules. These "hot" nodules substitute for the rest of the gland function and cause hyperthyroidism (27,12). Studies with radioactive iodine administered prior to surgery have not demonstrated consistently the relation between morphology of a nodule and its iodine metabolism (27).

NEOPLASMS

All benign neoplasms arise from follicular cells. This includes adenomas as described above under "hot" nodules and teratoma of the tissue adjacent to the thyroid, occurring most frequently in infants. Malignant neoplasms may result from overexposure to carcinogenic chemicals, drugs, and ionizing radiation. The most common malignant neoplasms of the thyroid are of follicular epithelial origin, papillary carcinoma and follicular carcinoma.(27,9,14)

Discussion

Malfunction of the thyroid can encompass hyperplasia, a hyper functioning of thyroid hormone secretion, generally thought to be thyroid nodules or tumors, ovarian disorders or pituitary problems; or hypoplasia, goiter, and thyroid nodular disease can be associated with iodine deficiency, liver abnormalities, dysregulation of the immune system, and food allergies. Medullary carcinoma of the thyroid is uncommon but can present as a thyroid nodule having high serum calcitonin levels used as a tumor marker. Papillary and follicular cancers also begin as thyroid nodules but are not as deadly as medullary carcinoma (9).

DIAGNOSIS:

Exam of the thyroid gland involves palpating the gland. Ultrasonography clearly visualizes the thyroid gland and nodules, and can provide information about location, number, size and consistency of the nodules.(5) However, it is not considered a routine test since current cost-effective evaluation of nodules does not include scanning or ultrasonography. The routine initial procedure for differentiating benign from malignant nodules is fine-needle aspiration biopsy.(6,25) "Cytologic diagnosis is inexpensive, reliable, and results in a better selection of patients for surgery." Lab test results are usually normal, but serum thyrotropin may identify "hot" nodules while plasma calcitonin may help diagnose medullary thyroid carcinoma (12).

TREATMENT:

Treatment of thyroid nodules is controversial since reports doubt the efficiency of suppression doses of levothyrocine for benign colloid nodules. In addition, it is not acceptable to select patients for surgery on the basis of suppressive therapy. And still further, suppressive therapy may be associated with significant bone and cardiac side effects, especially in post menopausal women and in elderly patients. "Hot" nodules can be treated with radioiodine, surgery, or percutaneous ethanol injection (12).

Thus, it is the intent of this research paper to pursue alternative treatments using chiropractic care, acupuncture, acupressure, foot zone reflexology, nutrition, exercise, self hypnotic relaxation exercises, and the healing power of intimacy to achieve a more balanced immune system and healthful state of the body as a whole.

After summarizing the conditions of the thyroid, it is now imperative to review the data available on the thyroid-immune interactions, and analysis of the possible integration between pituitary-thyroid hormones and immune factors that favor the development and maintenance of both thymic and peripheral immune efficiency.

Hormones and neurotransmitters regulate various target tissues in the body, reach lymph organs and cells through the circulation of blood, or direct autonomic nervous system connection between nervous tissue and lymph system organs.(4) "The neuroendocrine-immune interaction, supported by circulating humoral mediators, is mainly due to and mediated by the hypothalamus-pituitary axis which may influence the immune system by releasing various hormones and neuropeptides into the blood with direct modulatory action on the immune effectors, or by regulating the hormonal secretion of peripheral endocrine glands, which also exert an immunomodulating action." (10)

Data from experiments on humans with hyperthyroid or hypothyroid situations and also in animals with experimentally induced hyperthyroidism and hypothyroidism, provide information on the interaction between pituitary-thyroid hormones and the immune system through the existence of receptors for thyrotropic and thyroid hormones on lymphocytes or the frequent immune alteration in both physiological and pathological fluctuation of thyroid hormones. (10, 21,17)

Fabris et al studied modulation of T3, the thyroid hormone Triiodothyronine, as it related to thymus endocrine activity. "The in vitro addition to the culture medium of T3 causes a complete recovery within a few hours culture." (10,11) Further, "A positive correlation was found between thymalin concentration and T3 but not Thyroxine (T4) levels, suggesting that T3 rather than T4 may represent the thyroid hormone acting on the thymus gland." (11)

It is noted that "experimental hyperthyroidism provoked by T4 administration is associated with an increase in the size of lymph nodes and in an enhanced output of small and large lymphocytes from the lymph nodes themselves." (10,11) However, contradictory data also exists on the proliferative response of T and B lymphocytes in human immunity.

In function studies on the effect of TSH, Thyrotropin, on immune efficiency, it was demonstrated that TSH acts on immune functioning as a potentiating factor. "Thus, it has been shown that TSH enhances the in vitro antibody response to both T cell-dependent and T cell-independent antigens." (11) Other studies on human lymphocytes investigated the effects of TSH on the proliferative capacity on the NK cell activity, demonstrating "that TSH exerts its immunomodulating action determining a primary effect on lymphocyte response to Interleukin-2." (11-16) Thus, "several experimental and clinical pieces of evidence have demonstrated that the neuroendocrine system does not only act as a modulator of the immune system, but also as a target for signals generated within the immune network. Examples of such interactions are the alterations that can be induced in the neuroendocrine balance either by removal of relevant lymphoid organs such as the thymus or by the functioning of the immune system itself, such as reactions to immunogenic or tolerogenic doses of antigens." (3-23) Additionally, the alterations in hormone release from the hypothalamus or from the pituitary induced by in vivo or in vitro administration of thymic peptides or lymphokines have given further support to the direct influence of the immune system on the neuroendocrine network. (1-11)

Deterioration of the immune system at the central or peripheral level does not represent an irreversible event but is dependent on the age-related defect of the microenvironmental factors in which the pituitary-thyroid hormones play a role. Endocrine, nutritional intervention, enkephalins, lysine, arginine, and zinc salts all emphasize the reversibility of age-related immune deficiency. (11,18)

The trace mineral, zinc, is involved in immunocompetence in man and in animals. Its deficiency causes, in humans, "hypoplasia of the thymus, spleen,

lymphnodes, Peyer's patches, and alterations in lymphocyte population including reduced helper T lymphocyte function, reduced natural killer activity, and number of T lymphocytes with increased B lymphocytes".(4,11) In animals studies, "thymic and lymph node atrophy and impaired cell-mediated cutaneous hypersensitivity reactions." (10,11)

It has been shown that both zinc absorption and loss through urine and feces are reduced in old age even though the cause for the progressive reduction of zinc turnover in aging is unknown.(11) Diets deficient in zinc cause alterations in the immune system, neurohormone and neurotransmitter levels, and in the balance of thymic peptides. "Thus, reduction of plasma levels of growth hormone, of thyrotropic hormone, of thyroid hormones, as well as of enkephalins has been reported to occur in the course of zinc depletion; all these humoral factors positively influence various immune parameters. In addition, zinc deficiency causes increased plasma level of glucocorticoids, epinephrine, and norepinephrine, which, on the contrary, have an immunosuppressive effect."(11)

Zinc supplementation trials have shown increased skin sensitivity to antigen antibody response to tetanus toxoid(11) , increased wound healing, and improved thymic endocrine activity.(11) Fabris noted an abnormally high TSH with normal levels of T3 and T4 and decreased levels of rT3 appear to be frequently associated with Down's Syndrome, but after zinc supplementation the abnormal levels of both TSH and rT3 could be corrected.(11) In addition, Fabris found that zinc supplementation could recover abnormally low serum levels of T3 hormone levels "Due to the strict interaction existing between the nervous, the neuroendocrine, and the immune system during the whole life of the organism, it is the disruption of such interactions in old age which is responsible for most of the age-associated dysfunctions";(11) abnormal stressor events have also disrupted these three homeostatic functions.(11)

NUTRITION

A balanced diet is essential to ensure proper thyroid functioning.(1)

Zinc, vitamin E and vitamin A function in the manufacture of thyroid hormone as do the amino acids arginine, lysine, tyrosine in addition to iodine.(18,19) As mentioned earlier, a deficiency in any of these nutrients results in low levels of active thyroid hormone, and in the aged, hypothyroidism. "Vitamin C and the B vitamins riboflavin (B2), niacin (B3), and pyridoxine (B6) are also necessary for the manufacture of normal thymic hormone."(19)

In addition to nutritional supplementation and the avoidance of goitrogen foods such as cabbage, "Exercise stimulates thyroid gland secretion and increases tissue sensitivity to thyroid function," (19) increasing the body's immune system through improved thyroid function.(19)

CHIROPRACTIC

Chiropractic care assists the body to maintain it's optimum state of well-being through spinal adjustments that allow the nervous system to function at it's best. In-between each of the bony vertebrae of the spine, nerves are protectively encased. It is the nervous system that feeds every gland, cell, tissue, bone, organ, and system of the body. Thus, through chiropractic adjustments, the chiropractor can relieve the altered biomechanics by a manipulative thrust, thereby maintaining correct bony alignment, joint stability, muscle balance and proper nervous system function.(2) Returning the biomechanics to a balanced state allows nutrients from the synovial and spinal fluids to bathe the body. The body is thus provided with the optimal opportunity to heal utilizing its own innate ability.. This in turn strengthens resistance and promotes healing.

ACUPUNCTURE

"Acupuncture is a therapeutic modality used in China as early as the late stoneage. Throughout Chinese history both acupuncture theory and practice has steadily evolved into an increasingly rich and complex system, eventually offering treatments for virtually every form of medical condition." (26) Traditional Chinese

Doctors attributed an obstruction of Ch'i energy, (a life force equal to that which flows through the whole universe, runs along meridians and can be stimulated and unblocked at these points) at the front base of the neck, to a condition of an enlarged throid gland congealed with blood. It may begin with an infection, a congenital anomaly, or from worry or fright. Acupuncture points in the treatment of the thyroid condition, goiter, may begin with insertion of a needle into the meridian of the Governing vessel, GV-20 and 22 on top of the skull(midline). The next points on the bladder meridian are B-1 and 2 the inside corner of the eye and brow; St-2 is just below the eye on the stomach meridian; H-7 on the heart meridian is inside of the wrist on the little finger side and TW-10 on the triple warmer meridian is on the outer surface of medial aspect of the elbow. Other points for thyroid dysfunction include ST-9 by the carotid sinus, Conception vessel CV-22 below the larynx(midline), GV-15 directly over the second cervical vertebra in the posterior midline, gall bladder meridian GB-12 behind each mastoid process of the skull, GV-14 directly over the 7th cervical vertebra posteriorly, and ST-27 lower abdomen left and right of midline, three finger widths below the umbilicus.(8)

"According to traditional Chinese medicine, a form of bodily energy called Ch'i is generated in internal organs and systems. This energy combines with breath and circulates throughout the body, forming paths called meridians. The meridians form a complex, multilevel network which connects the various areas of the body, including the surfaces with the internal. All of the various meridian systems work together to assure the flow and distribution of Ch'i throughout the body, thus controlling all bodily functions. The interwoven meridian systems and the possibilities for diagnosis and treatment they offer, are called meridian theory. When an organ or system is not balanced, related acupuncture points may become tender or red, allowing for diagnosis. For treatment, a point on the skin is stimulated through pressure, suction, heat, or needle insertion, affecting the circulation of Ch'i, which in turn affects related internal organs and systems." (26)

"An organ, by its physical existence and functioning, releases energy (Ch'i) and creates an electro-magnetic field. This energy contains information about the organ and its' activity, so both the physical structure and the functioning of the organ effect the quality and strength of the energy and information that are created. This is the source of the meridians. An imbalance in one meridian often brings about imbalances in others, and other factors, including emotions, can effect individual meridians and the meridian network as a whole." (26)

ACUPRESSURE

Acupressure is the massage of acupuncture points. (8) First, the pressure points are located, and before treating the points it should be determined whether pain is elicited on shallow or deep pressure, and if pressure on the point causes pain to be felt in another point. If the pain becomes more prominent at a point "removed from the point you have just pressed the new point of pain is the true control point." (8) This oriental technique provides information through the use of reflex. Pressure is then applied in the amount that would be applied to the eyeball without discomfort, using rotary motion with the thumb or third finger until the pain diminishes or disappears. (8)

REFLEXOLOGY

Reflexology is an ancient therapy based on the premise that our organs have corresponding reflex points on other parts of the body, some of the most sensitive points being those on the feet. There are many places on the body that contain all the reflex points for the entire body. Dr. Ralph Alan Dale, director of the acupuncture education center in Florida, calls these "Micro- acupuncture systems" (2) where energy pathways of the body converge and nerve fibers of all organs are directly or indirectly represented in the anatomy of the human fetus. (2,7) "The known areas of the body having all the reflex points are the wrist, (making Asian pulse diagnosis possible) the foot, hand, ear, neck, abdomen, face, head, arms, legs, nose, the iris of the eye, (making iris diagnosis possible) and the tongue." (tongue diagnosis) (2)

Our feet are such strong energy poles of the body, linking energy emanating from the earth, grass, sand and snow. They are constantly under wear and tear due to the force of gravity and they accumulate large deposits of lactic acids and tensions that affect our entire being. Hardening from tissue degeneration can be felt, seen, and treated. Because feet are frequently covered with shoes and socks, the reflex points are very sensitive and can remain quite tender. "Reflex treatments can release up to 80% of the lactic acid residues in the body, allowing it to flow back to the liver to be recycled as glycogen or energy." (2)

Reflex points are similar to acupuncture loci except that they are on reflex zones and points on meridian pathways. The thyroid zone is located on the large pad of the foot below the great toe, while the pituitary point is in the center of the posterior great toe pad. Pressing reflex points can be performed through massage or gentle rubbing the general area of the reflex point, by inching the thumb bit by bit in specific areas, or by keeping the thumb on one contact but rubbing back and forth gently. The breath is also used. Both practitioner and patient inhale and control the breath to a specific spot. Next, the practitioner guides the patient to exchange good elements in the breath to replace degenerating cells in the organ, exchanging health for disease. Finally, on exchange, both parties command the organ to heal and relax, healing negativity.(2,7)

"Muscles store repressed psychological inhibitions and tensions, which, when pressure points are stimulated, mechanically release the psychological stress that prevents both bodily and emotional balance"(2) Integrated reflexology combines diet, exercise, and the use of healing visualization and affirmation to provide the art of integrated treatment of physical, mental, and spiritual points of view.(2)

SELF-INDUCED HYPNOTIC RELAXATION

In his book, *Hypnosis-My Times and You Life*, Dr. Max Zebelman relates that "relaxation is a major part of hypnosis"(28) He states people can be trained to experience the rewards of a relaxed nervous system, thereby relieving anxiety.

Progressive relaxation technique is the basis for other techniques and is one of many techniques that he encourages, which may include focused relaxation, internal focused breathing, candle blowing exercise, yoga 4-8-4-breathing exercise, nature exercise and cloud relaxation, to mention additional methods of self-hypnotic relaxation exercises.(28) In this way a person can actively participate in his/her own healing process, taking responsibility for their bodies and minds, as it is within our power to maintain a vibrant, healthy balanced body.

Following progressive relaxation of all areas of the body, and a self induced state of hypnotic relaxation, Zebelman Ph.D., encourages one to " drain all unwanted feelings, pain, depression, unhappiness...into the outside world, away from you, fill up with good feelings, confidence, courage. Your mood will elevate. You have the power. You will use it effectively." (28) A person can put oneself into deep relaxation as frequently as every hour if they desire. Zebelman relates it is not only the way we look at things that are so distressing but " it's the self-talk we do about these events" that can influence the state of our wellness.

(28)

HEALING POWER OF INTIMACY

"Most Physicians are not trained to deal with suffering as a doorway or as a catalyst for transformation. Pain is a messenger. Curing is when the physical disease gets measurably better. Healing is a process of becoming whole."(20) Dean Ornish M.D., contends, anything that promotes a sense of isolation leads to illness and suffering, and anything that promotes a sense of love and intimacy, connection and community is healing. He relates "When people begin to be real with their feelings, things happen in their body's physiology that encourages healing."(20)

The emotions originate as a field that flows all around and through brain, glands, immune system, heart and intestines making up a complete informational system. (4,20)

The emotions modulate the mechanisms in immune systems that help create our very body network. Our healing mechanisms are truly governed by these emotions and it can all shut down.(20) In Eastern systems, the central part of what mediates the emotions is the heart. Through studies performed both on women with breast carcinoma and men and women with heart disease, the men and women who are part of psychological support groups have a statistically longer life span than men and women with comparable diseases who are not in such groups. (4,20) "What makes the support group so powerful is that people begin to realize they're not alone. They try to create a safe environment that gives them permission to talk about what they are really feeling- 'Here's what's really going on in my life' and to encourage people to listen with empathy and compassion without judging them, rejecting them, abandoning them, or trying to fix them." (20)

It is through rediscovering inner sources of peace, joy, and well being that we open ourselves to the "interconnectedness of life, love, intimacy, and meaning."(20) They are extremely powerful.

Conclusion

There are many ways that we have to help heal ourselves. It is possible to proceed from the external manifestations of signs of dysfunction, illness, and disease, whereby we may employ all methods of physical technique, procedures, medications, and surgeries, as we deem necessary for that moment in time.

It is also possible to proceed from within our very internal being, in search of total inner peace, a total willingness to be at peace within ourselves, open to love, open to embrace, open to intimacy and connectedness for every moment in time.

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