

SOME COMMON TYPES OF HYPOSECRETION OF THE THYROID

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It is the object of this paper to present a few types of what I consider hypothyroidism, or symptoms of sub-thyroid secretion. Many of these conditions are not recognized, and patients suffering from disturbed physiology of this gland drift from physician to physician, and are improved only after the diagnosis has been made and the proper treatment inaugurated. Unquestionably, many of these patients are psychopathic and may improve by mental treatment. The thyroid gland is peculiarly susceptible to mental stimulation and to mental depression, and anything that quiets mental excitation will diminish a hyperthyroid secretion of the gland, and anything that removes mental depression will increase a subnormal secretion of the gland.

Some instances of disturbed secretion of the thyroid, a few of which I shall relate, look like pure hysteria, or that disturbed nervous state which we call neurotic, but for the pathology of which we are still searching. Therefore, many will ascribe the favorable results obtained by treatment of the thyroid as simple instances of mental impression.

The physiologic activities which a normal thyroid is expected to furnish may be summed up as follows: It is a necessary stimulant to growth in childhood, both bodily and mentally; it is always a stimulant to mental activity and to proper cerebration; it takes active part in the deposition and distribution of fat; it takes an unknown but important part in nitrogen metabolism, and many times it is an active opponent to nitrogen poisoning; without its activity proper genital development is impossible, and the secretion of the genital organs is imperfect. It takes an active part in the function of menstruation and in the development of the fetus in pregnancy. During the repeated periods of menstruation and during pregnancy it normally furnishes an extra amount of secretion. If it does not do so, the menstrual function is imperfect, the woman during pregnancy is abnormal, and parturition is likely to develop eclampsia and the child is likely to be born a cretin.

The thyroid gland, while present in the young infant, reaches its full development only at puberty, and after 45 begins slowly but progressively to furnish a diminished secretion; the gland gradually atrophies in old age. This atrophy or diminished secretion seems to allow an increased connective tissue development in various parts of the body, notably in many organs; in other words, its atrophy allows sclerosis, and its early atrophy or early insufficiency causes early sclerosis.

The gland has a good deal to do with the condition of the blood. This, however, is not well understood. At times, too much of its secretion causes hemorrhage. At other times, an insufficiency of its secretion allows or causes hemorrhage. This difference in action is perhaps due to the facts that too much secretion dilates the blood-vessels (the gland furnishes a secretion which is a vasodilator), which may allow or cause hemorrhages from mucous membranes, as from the nose or from the uterus, and that subsecretion must sometimes allow a condition of the blood to occur which is not dissimilar to that of hemophilia or to that condition which occurs in patients with hemorrhagic diathesis; in other words, a very

aplastic condition of the blood, perhaps a diminished calcium content. It seems, at times, to have something to do with stimulating or encouraging the production of red blood-corpuscles, as in the condition of chlorosis it is not properly functioning.

When it is considered how little secretion the thyroid furnishes per hour or per day, and that this secretion is picked up by the blood as it passes through the normal thyroid, it is not surprising, when there is an enlarged thyroid from normal hypertrophy, such as occurs in Graves' disease, and especially when the blood-vessels are dilated as seen in many such cases, that the blood, acquiring so much more thyroid secretion in a given time, must of necessity produce the intoxication that we see in this disease. An enlarged thyroid with large, dilated vessels, has been estimated to allow the whole blood of the body to pass through the gland at least once an hour. When it is remembered that thyroid feeding may produce prostration and dangerous symptoms, it is easily understood why, in Graves' disease, the blood thus loaded with thyroid secretion causes such serious and sometimes dire symptoms.

As above stated, various mental conditions stimulate or depress the thyroid. This is true of some functions, foods and drugs which act on the thyroid. The stimulants to thyroid secretion are great sorrow, great joy and nervous tension; sexual excitement, genital disturbances, especially uterine, and pregnancy; cerebral stimulants, such as coffee, tea and alcohol; and such drugs as arsenic, iodids, phosphorus, salicylic acid, pilocarpin and, of course, thyroid extract. The idiosyncrasy of some patients to iodids I believe to be due to an extra susceptibility of the thyroid. Depressants to thyroid secretion are: quiet, seclusion and absolute rest; absence of all sexual excitement and all genital irritation; a milk or milk and cereal diet; lime, perhaps in almost any form but especially as the glycerophosphate; most hypnotics, especially bromids and chloral; opium as a quieter of all glandular activity, possibly by quieting the mental activity and stupefying it; and ergot.

I can only express once more my hope that the physiologic chemists will soon be able to differentiate the various elements of activity of the thyroid gland. Histologically, the thyroid may be perfectly normal, and yet it may be furnishing a secretion that is disturbed, i. e., the relation of the different elements to each other is abnormal, and yet, as a whole, the gland will be neither oversecreting nor undersecreting. Such a differentiation would explain the varying symptoms caused by subsecretion and would account for the fact that such symptoms are not improved when the whole gland is fed.

When the very active part that the thyroid gland takes in the life of the female is recognized, it is not to be wondered at that thyroid instability so frequently occurs in women, and that the normal activity of the gland is so often increased at times when it should not be increased, or, on the other hand, that, having been so many times normally hypersecreting during the woman's life and so many times not returning quickly to normal when such hypersecretion is not needed, the gland becomes overworked and finally hypofunctionates. This thyroid instability, at times hypersecreting, at others hyposecreting, can account, as no other one etiologic factor can, for the so-called neurotic women who have at one time an asthma, at another time an urticaria, then an eczema, then a diarrhea, then perhaps joint pains, then unexplainable vomiting, then headaches, then tachycardia; each condition when present

urgently calls for treatment, while improvement is followed by another abnormal condition.

As I propose to offer a few clinical histories of patients who have hyposecretion of the thyroid, I will first present a list of the conditions for which I think subsecretion of the thyroid may be responsible. These are: cretinism, slow growth in children, some types of eczema, some forms of asthma, infantile obesity, chlorosis, amenorrhea, some digestive disturbances, some forms of epilepsy, some forms of gout, depressant hysteria, sometimes the vomiting of pregnancy, some forms of eclampsia, some forms of melancholia, adiposis dolorosa, lipomatosis, myxedema, senility and perhaps Raynaud's disease.

The following case shows the improvement caused by the feeding of thyroid to a defective child:

CASE 1.—History.—The patient, a girl, was first seen when she was 3 years old. She was the mother's first child, and though not a cretin, was fat, rather large for her age, very backward about talking, and did not walk until she was $2\frac{1}{2}$ years old. She had four teeth when she was 5 months old, and twenty when 18 months old. She was cross-eyed and pot-bellied, a large eater, and the bowels tended to be loose. She did not tell when she desired to urinate, and could not control the bladder. Adenoids had been removed, but the patient drooled a great deal, and could say but two or three words, and there had been no improvement in this line for three months. She was very nervous and did not sleep well; cried a great deal; and would not play by herself. There was no history of any sickness; she never had had any eruptions or a convulsion. The father and mother were both perfectly well. Physical examination was negative, except as above stated.

Treatment and Course.—The patient was given 1 grain of thyroid substance twice a day for some time, and then once a day for many months. In two months there was marked improvement; she slept well, cried less and grew taller; the abdomen became normal and the disposition improved; she told when she desired to urinate and began to talk more. When first seen she walked incoordinately; this also improved, and in two months the patient fell but very infrequently. In about two years she began kindergarten work and continuously improved in all lines.

I had this child under observation for about three years. The mother of this child, aged about 30, became pregnant two years ago, and lest she should give birth to another child who had subthyroid secretion, I gave her 3 grains of thyroid a day during the last three months of her pregnancy. She gave birth to a male child which weighed $14\frac{1}{2}$ pounds and was fine and perfect in every way.

The types of eczema which are improved by thyroid treatment are those which occur in babyhood and childhood around the orifices of the body and as fissures in the skin. The dry scaly eczemas and the itchings of old age are also benefited by thyroid. Patients with dry skin, with or without powdery desquamation, in all grades up to real ichthyosis, lasting often a lifetime, show improvement after thyroid. The following two cases show the value of thyroid in these conditions:

CASE 2.—History.—The patient, a young unmarried woman aged 26, was first seen four years ago. Her skin, especially of the hands, abdomen and legs, since childhood had always been rough, harsh and almost like a mild ichthyosis. The epidermis peeled off in clouds and showers of dust every time she removed her clothing. She had never perspired normally, and was always very cold in winter.

Treatment and Course.—After a month or two of thyroid treatment the skin became softer; the patient said that the epidermic scaling was less than it had been since she could

remember. The following winter she felt the cold less than she ever had. Her general health also improved. She was given thyroid on an average of 2.5 grains a day, sometimes more and sometimes less, for a year.

CASE 3.—The patient, a man aged 61, had had more or less general eczema for two years. He suffered terribly from burning sensations and from itching, and always felt the cold greatly. He had received all kinds of treatments. He was put on thyroid, and almost immediately there was less itching; the skin felt better and he did not feel the cold, and in a month there was great improvement. He was then not seen for several months, when the same symptoms were beginning to return. He was put on thyroid treatment and again improved.

Sometimes the etiologic factor in asthma is, as all know, very difficult to determine. Without enumerating the many causes, suffice it to say that occasionally a disturbed thyroid secretion is the cause, and that the securing of an increase in the secretion of the thyroid cures the patient. The following is an example:

CASE 4.—History.—The patient, a married woman aged 42, had suffered from a cough, off and on, for eight years; for the last two months before I saw her she had had it steadily. She raised both mucus and pus, but never any blood. The menstruation was regular, but had been scanty for a year. She never had had any severe illness. She had had six children; the youngest was 3 years of age. The family history was negative. She was wheezing with a typical asthmatic condition, and had great dyspnea on the least exertion. She had had a bad asthma attack six months before, the first one she had ever had. She had lost 20 pounds within a short period. The present attack of asthma had lasted two weeks. The sputum was negative as to tubercle bacilli. The thyroid was small. The diagnosis was asthma due to impaired thyroid secretion.

Treatment and Course.—To activate the thyroid the patient was given 3 grains of sodium iodid three times a day; she began to improve immediately; the asthma and cough disappeared and she gained 2 pounds in four days. The iodid was then reduced to twice a day, and in another week she had gained 6 pounds, and was feeling well in every way. The iodid was then reduced to 3 grains once a day, and in a week she considered herself cured. The successful action of this small dose of iodid was as an activator of the thyroid gland.

The next case shows an interesting story of various subthyroid disturbances.

CASE 5.—History.—The patient, an unmarried woman aged 40, came to me complaining of abdominal distention, which she had had for three years, and which had become worse during the last six months. All kinds of diagnoses had been made of various intestinal indigestions, disturbed circulation, etc., for which she had been treated. The bowels moved three times a day; this had been a habit for years, and she did not call it a diarrhea. Menstruation was regular. She had some palpitation and some little dyspnea, and at times she thought she had an asthma; she could not sleep well at night on account of it. She had had a slight cough for a good many years, frequently raising mucopus; she was subject to hay-fever and asthma in the summer. She felt weak all the time, and said that her feet and legs occasionally swelled at night. She had lost weight. The pulse was slow, down to 54. The lungs were asthmatic; heart normal; abdomen negative, except that it was tympanitic. The urine was negative. Diagnosis, hyposecretion of the thyroid.

Treatment and Course.—The principal treatment was thyroid, at first 5 grains a day, then $2\frac{1}{2}$ grains a day, then $2\frac{1}{2}$ grains every other day; ten days from the time she started the treatment the patient stated that she had not been as well in every respect for three years.

The following case is interesting as showing a combination of asthma and eczema.

CASE 6.—History.—The patient, a girl aged 6, was subject to recurrent colds, with asthma. She had somewhat enlarged tonsils, was pale, a poor eater, and had a more or less constant peculiar skin eruption; it was not eczema and not itch, although the first appearance looked like scabies. The child never perspired. The diagnosis was insufficient thyroid secretion.

Treatment and Course.—The patient was given 1 grain of thyroid a day for some weeks. Very soon the eruption and asthma disappeared and the child improved and became well. I did not see her again for one and one-half years, when she again had an asthma. At this time I gave her 3 grains of sodium iodid three times a day to activate the thyroid gland. She did not improve. The asthma was no better. I gave her 1.5 grains of thyroid once a day, and the asthma quickly disappeared. I did not see her again for two more years, when she had the same recurrence of asthma. Thinking that she was old enough now for the iodid to stimulate the thyroid, I gave her 3 grains of iodid three times a day. This acted as I expected, and the asthma quickly disappeared.

Amenorrhea is very successfully treated with thyroid; chlorosis will often improve as rapidly with thyroid as with iron or arsenic. In fact I know of no emmenagogue which acts as well as thyroid. Whether in large doses it could cause abortion, I do not know, but certainly in delayed menstruation in young girls and in amenorrhea at almost any age, especially if there are other symptoms of insufficient thyroid secretion, as putting on of weight or drying of the skin, thyroid is almost a specific.

It is rarely recognized that a number of digestive disturbances can be due to insufficient thyroid secretion. It is recognized, however, that hypersecretion of the thyroid can cause such disturbances. These disturbances are mostly diarrheas. The exact reason that insufficient thyroid secretion causes indigestion, and especially intestinal indigestion, is at present difficult to understand. The following is a very interesting instance of the successful use of thyroid:

CASE 7.—History.—The patient, a boy aged 8, was brought to me two years ago with the history that three and one-half years before he had had an acute intestinal attack of some kind with which he was seriously ill for months. Since that time, off and on, at intervals, he had had these intestinal upsets, with bad diarrhea, and at this time frequent involuntary movements. He also at these times had albuminuria. There was a peculiar pigmentation on the hands and neck, and a little on the face; also there were some leukodermic spots on different parts of the body, especially the neck and hands. He had also some of this dark pigmentation on his thighs and lower abdomen. All sorts of diagnoses had been made and all sorts of treatments had been instituted, all more or less unsuccessfully, although sometimes these diarrheal attacks seemed to become better under some treatment, only to recur again. The heart, lungs, abdomen and urine were negative. A few of the cervical glands were palpable.

Treatment and Course.—The patient was given thyroid, and electric treatment to the imperfect anal sphincter. The sphincter soon became competent, and the boy improved in every way; the diarrheal attacks entirely disappeared, and after having been for years on a rigid diet, he was now allowed all kinds of assorted food. The pigmentations and leukodermic spots gradually disappeared, and the patient became well. The thyroid treatment in small doses was continued for some months and then stopped, and in April, 1911, a year after I had first seen him, the patient began to have a little trouble again in the way of diarrhea, followed by constipation; also there were some abdominal pains, and puffing and swelling in different parts of the body, especially under the eyes. He had little irregular temperature attacks; sometimes palpitation of the heart. He was again given thyroid, and again he improved, and the pigmentations, which had more or less returned again, faded. The boy, with slight

disturbances, is constantly improving, growing and doing finely. The last time I saw him was in December, 1911.

If epileptic attacks occur at the menstrual periods, or at regular four or five-week intervals during amenorrhea, or develop at the menopause, disturbance of the thyroid is often the active or exciting cause, and the disturbance is generally a subsecretion. The reason that thyroid has been used unsuccessfully so many times in epilepsy is that the cases have not been properly selected. When thyroid is properly administered in the above-described class of cases, many times improvement and sometimes absolute cures take place, and any treatment that is successful without the use of enormous doses of bromids is certainly good treatment. The following is a case of great interest to me:

CASE 8.—History.—The patient, a girl aged 17, first came to me in April, 1904, with the history that from July, 1903, she had had peculiar sleeping attacks in which she would be almost in a comatose condition for two or three days. These attacks kept increasing in frequency, averaging at first once a month and now twice a month. In the last attack or two she had shown some stiffening, but had never had any convulsive movements, although she had made slight noises and had a little frothy mucus appear at the mouth. In the last attack she slept but twelve hours. After these sleeping attacks she could not hear for several days, and could not see well for two or three days, at times being almost blind; she did not recognize her family for several days. She lost her voice for nearly a week, and during these days did not recognize her own clothing, jewelry, etc. In some of these sleeping periods she did not appear even to breathe; she took no nourishment and no liquid, and at times passed no urine for from two to three days. Menstruation began when the patient was 14 and was slightly irregular, generally occurred every five weeks, and lasted four or five days. The sleeping attacks had generally occurred just before the period. Physical examination was negative in every respect, except that there was a slightly movable right kidney, and the thyroid gland seemed enlarged, though evidently subsecreting. A diagnosis of epilepsy and catalepsy was made, and the fact that these attacks occurred just before the menstrual period and were worse if the period was delayed, gave the indication for treatment, viz., to hurry menstruation and to antagonize whatever toxins might be in the blood at that time. Thyroid is an antitoxin, probably, of protein poisons.

Treatment and Course.—The patient was given thyroid from April, 1904, and she never had another one of the sleeping attacks. In June, she had a typical slight epileptic attack. In January, 1905, she was still doing finely, but had had two attacks of losing herself for from two to ten minutes after slight injuries; in other words, *petit mal* attacks. In May, 1905, having stopped the thyroid for some months, she again had several epileptic attacks in one day, followed by a prolonged sleep. Thyroid again stopped this. She married in August, 1905, and was not seen from that time until November, 1910, during which time she had had no recurrence of fits or sleeping attacks, but she now complained of hot flashes, fainting periods and some irregular swellings. She was again given thyroid, with small doses of iodid, and I have not seen her since, but I feel sure that she would have come to me had there been any recurrence of the trouble.

CASE 9.—Five years ago the mother of this patient, aged at that time 44, had an attack of what was called rheumatism, and was sick for a number of weeks in a New York hospital. The rheumatism was located in the legs, and there were peculiar hemorrhagic spots all over both legs. She also, while in the hospital, had recurrent bleedings from the kidneys. She had been given the usual treatments, but receiving no relief, she came to me, hardly able to travel. Knowing the history of the daughter and the tendency of thyroid disturbances to run in families, I decided to give her thyroid. The bleeding ceased within two days, and the petechiae rapidly

disappeared, as well as the rheumatic symptoms, and a number of years after there had been no recurrence.

The exact relation of thyroid secretion to the normal plastic condition of the blood is not known. Ordinarily, feeding thyroid will stimulate bleeding possibly by causing a dilatation of the blood-vessels, particularly of the uterus and nose, but instances not infrequently occur when the feeding of thyroid in hemophilia stops the bleeding. An interesting instance of its action was in an overweight woman at the menopause who, in spite of all the ordinary treatments, including calcium, epinephrin, ergot, atropin, digitalis, etc., etc., bled profusely from the nose, gums, ears, stomach, intestines and bladder; the urine passed seemed almost pure blood. The woman was nearly exsanguinated. This was four or five years ago, and rabbit- or horse-serum injections were not tried. From the history of having put on a good deal of weight and of sleepiness, I advised the administration of thyroid. The patient was given large doses of thyroid, and in twenty-four hours the bleeding ceased and did not recur until a week later, when, the thyroid having been stopped for two days, there was a slight recurrence. On the readministration of the thyroid, the bleeding again ceased.

Subsecretion of the thyroid can cause mental depression to all intensities, from simple apathy and indifference through depressant hysteria to actual melancholia. Administration of thyroid to such patients always causes improvement. Activation of the thyroid with small doses of iodid in cases of mild subsecretion of the thyroid causes cerebral stimulation and satisfactory improvement. The obverse of this is well known, viz., that the administration of either thyroid or iodid in Graves' disease will always increase the disturbance.

The most frequent of all hypothyroidism instances are those associated with added weight. These symptoms grade from the simple putting on of flesh after 40, especially in women after the menopause, to adipositas dolorosa, lipomatosis and myxedema. The symptoms of typical hypothyroidism are scanty or absent menstruation, fat deposits on the breasts, upper arms, at the clavicles, hips, and upper part of the thighs, and, at times, the abdominal apron which may hang over the pubis. Other associated symptoms are drowsiness, slow pulse, dry skin, puffiness of parts of the body at various times and, perhaps, slow mentality. Instances of this type of patient are so frequent that it is hardly necessary to present clinical histories. Other symptoms of subthyroid secretion are puffing under the eyes and of the hands and feet, without kidney or cardiac lesion. This puffiness is not a real edema and may occur asymmetrically or symmetrically and at irregular times of the day; it is often worse in the morning. The skin is likely to be dry in these cases. Sometimes a glycosuria is due to insufficient thyroid secretion, as it may also occur in hypersecretion.

The following case is unique:

CASE 10.—History.—The patient, a young girl, aged 16, was seen by me in consultation in 1905. The family history was negative. The patient had had convulsions when she was teething; was backward in school; began to menstruate when she was 14, but had not menstruated during the last year. She had attacks of fever, which had begun about a year before at the time the menstruation ceased. They lasted about nine days, to recur again in about three weeks. At the onset she had chills, headache, loss of appetite, pain in the abdomen, loose bowels and insomnia. She had been treated for typhoid fever, for intestinal tuberculosis, malarial fever and hysteria. During these fever attacks the temperature went above 103,

the pulse sometimes up to 130, and the respirations up to about 30. A diagnosis had also been made, on account of enlarged glands in the neck and enlarged spleen, of Hodgkin's disease, and the patient had been given repeatedly long-continued doses of Fowler's solution.

Examination.—It was during one of her fever attacks that I saw her. The glands of both sides of the neck, and also in the axillae and groins, were somewhat enlarged; the pupils reacted slowly; the conjunctival reflexes were present; the heart and lungs were negative; the spleen was enlarged almost to the umbilical line and tender on palpation; the liver was apparently normal in size; the ovaries were not tender; the knee-jerks were exaggerated. The urine and the blood were negative. Just preceding one of these attacks of fever the mother said that the girl was listless, but still restless, and she (the mother) would know that a fever attack was about to begin. With this history and the repeated improvements and the continued recurrences it was impossible to make a definite diagnosis. On the other hand, the very fact of the periodicity and of occurrence about the time of the expected periods and that there was amenorrhea suggested the possibility that if the patient menstruated regularly, she would not have these attacks of what was apparently a toxemia.

Treatment and Course.—The patient was given 5 grains of thyroid twice a day. In ten days she began to menstruate and was feeling well. The next month she menstruated again. Under thyroid medication, given intermittently, she menstruated every month until April, 1906, when she ceased to menstruate. Then in May, when I saw her again in consultation, she again had a temperature of 102; abdomen was tense; spleen was enlarged; glands of the neck tender. She was given thyroid, and in a few days began to improve. In a few days the spleen and the glands were less tender and smaller, the temperature disappeared, and she became apparently well, and menstruated normally in June. This was in 1906. Her physician tells me that she was well until July, 1907, when, following a tonsillitis, the spleen again became enlarged and she had slight recurrence of the above symptoms. She was given thyroid, and in two or three days was again normal. She was well when last heard from, in March, 1911.

Lest I seem to advise the frequent and careless use of thyroid, please let me urge that, when it is needed, but small doses be used, as it is potent for harm. When given to patients who should not receive it, it will make their symptoms worse, and sometimes but a little of it will push a wavering thyroid gland to hypersecretion and Graves' disease.

It should be added to the list of poisons, and the laity should not be able to obtain it without a physician's prescription. Though much of the thyroid substance on the market is not active, a little coincidentally administered iodine, as an iodid, will render it active.

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Cancer Not Necessarily Painful.—The symptom which more prominently characterizes the early stages of cancer of the cervix is bleeding, bleeding between the periods, or some discharge containing blood in between the periods. At that time there is no pain whatever in cases of cervical cancer. Remember that, because the public mind associates pain with cancer, and the patient is apt to think because she has no pain that therefore, no matter what the trouble is, it is not likely to be cancer. But there is no more dangerous fallacy. For a long period, in fact, as long as the disease remains limited to the cervix itself, the patient has no pain at all. It is not until the disease begins to spread beyond the limits of the cervix that you begin to find the patient has pain. So do not be misled. Any unexplained bleeding, any bleeding, occurring between the periods—if we take a patient during menstrual life, or still more definitely, any bleeding occurring after a definite menopause has been established—is extremely suggestive of cancer.—Arthur H. N. Lewers in *Clin. Jour.*