PSYCHOSIS ASSOCIATED WITH MYXŒDEMA.*

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HISTORY AND LITERATURE.

GULL, in 1873, presented a paper before the Clinical Society of London entitled "On a cretinoid state supervening in adult life in women," in which the chief symptoms of myxœdema were given. ORD, in 1877, presented material from observations collected since 1861 to the Royal Medico-Chirurgical Society of London entitled, "On myxœdema, a term proposed to be applied to an essential condition of 'cretinoid' affection occasionally observed in middle-aged women." A committee was appointed in 1883 by the Clinical Society of London to study the subject of myxœdema. Their report¹⁴, a most interesting document, included a complete bibliography; it was published in 1888 and gave an analysis of all known clinical cases up to that time. Very little has been added since then to the purely clinical features and the elaborate tables of clinical data in 109 cases they were able to find. They summarized the intellectual changes, with notes pertaining thereto, as follows:

Slowness (report of 60 cases).—Absent in three. More or less marked in 56, doubtful in one. Of the intellectual changes, slowness in apprehension, thought, and action is most constant, its absence being noted in three cases only.

Abnormal persistence in thought and action (report of 29 cases).—Absent in 22. Present in seven. Abnormal persistence in thought and action is recorded in about one case in four.

Imperfection or perfection of mental processes (report of 41 cases).—Imperfection in 15, perfection in 26. In a rather larger proportion there is more or less imperfection of mental processes, the defect being, as noted before, one of retardation or sluggishness.

Writing (report of 33 cases).—Good in twelve, slow in seven, more or less inability in eight. Six were illiterate. (Specimens of handwriting were sent in four cases, but no opinion given). Writing is sometimes slow, sometimes imperfect, conditions which may in large measure be attributed to the state of the hands. In the case of educated persons the handwriting is usually good, and the length of letters, in all respects well indited, is remarkable.

Irritability (report of 53 cases).—Absent in 19. Marked in 32, placid but fretful at times in two. Irritability is a marked feature, though in exceptional instances the reverse is stated. In some cases placidity alternates with occasional outbursts of fretfulness or irritability.

Sleep (report of 73 cases).—Good in 37, bad and disturbed by dreams and sensations in 25, drowsiness during the day (both in good and bad sleepers) in 17, variable in one. In a large proportion sleep is noted as good, but in many of these there is excessive somnolence, especially in the daytime. In about a third of the cases wakefulness is recorded,

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and sleep is often disturbed by horrible dreams and sensations. It may be noted that drowsiness during the day is common in myxœdema in both good and bad sleepers.

Delusions (report of 46 cases).—Absent in 28. Present in 18.

Hallucinations (report of 43 cases).—Absent in 27. Present in 16. Delusions and hallucinations occur in nearly half the cases, mainly where the disease is advanced.

Insanity (report of 45 cases).—Absent in 29. Present in 16. Insanity, as a complication, is noted in about the same proportion as delusions and hallucinations. It takes the form of acute or chronic mania, dementia or melancholia, with a marked predominance of suspicion and self-accusation.

Agoraphobia (report of 33 cases).—Absent in 21. Present in twelve. Agoraphobia is present in a smaller proportion than the mental changes previously mentioned. In many cases its mere existence is noted, but, in a few, details are given, which show that this condition was undoubtedly present in a marked degree.

State of memory (report of 71 cases).—Good in 25, defective or bad in 46. Memory is usually impaired from an early period of the disease, especially in respect of recent events. It is recorded as deficient in 46 out of 71 cases.

Changes in speech (report of 104 cases).—Absent in four, marked in 100. It is evident from the tabulated returns that changes in speech are very constant. In four cases only, out of 104 replies, is no alteration noted, and in two of these four there is a history of slow and drawling speech in the initial stages. Slowness is the most marked feature, though in many cases articulation is described as either 'deliberate,' 'monotonous,' 'slurring,' 'hoarse,' 'nasal,' 'thick,' or 'hesitating.'

Eyes and vision (report of 83 cases).—Normal in 46, various impairments in 37. Various returns have been made under the head of 'eyes and vision.' In more than a half no abnormality exists. Most of the defects recorded are clearly accidental. In a small proportion two conditions are noted, which may probably be looked upon as belonging to the disease: (1) general diminution of acuteness of vision; (2) watering of the eyes. It may be mentioned here that exophthalmos has been observed once or twice in the early periods of myxœdema.

Ears and hearing (report of 60 cases).—Normal in 27, impaired in 32, one doubtful. Hearing is impaired in more than half, and in a considerable number the defect has been unilateral. As in the case of vision, it is probable that in some the impairment of hearing was simply coincident. Nevertheless, deafness to a varying extent must be looked upon as a condition proper to myxœdema, and not merely an accident.

Nose and smell (report of 54 cases).—Normal in 36. Smell impaired in eleven, perversion of smell in one, watery discharge from nose in six. The sense of smell is not infrequently defective. In a few cases a profuse watery nasal discharge is observed. In one instance perversion is noted.

Taste (report of 47 cases).—Normal in 27, defective in 18 (total loss in one, retarded in one, perverted in one). Taste is more often impaired than smell. In one case total loss is recorded. Retardation occurs in isolated cases only; but perverted subjective sensations are common.

Osler, in 1889, reported the unusual case of a man, aged thirty-one years, who had signs of exophthalmic goitre and of myxœdema with rapid pulse. Early in his illness he had ideas of being pursued. Later melæna and fatal delirium with glycosuria, in which he was maniacal, developed.

Hooper, in 1903, reported a case in which anorexia nervosa was a precursor of myxœdema. Régis, in 1911, reported the case of a woman, aged thirty-three years, with onset of psychic symptoms and myxœdema. She recovered when thyroid extract was given. The condition recurred on cessation of

treatment, and at the age of forty-five years she was sent to hospital with myxœdema. She had a mongoloid appearance and psychosis with chronic hallucinosis and confusion. Treatment helped the myxœdema but not the psychosis.

Bruce, in 1912, reported the case of a woman, aged forty-six years, in whom myxœdema and psychosis with loss of memory developed after exophthalmic goitre. She was disorientated, and thought friends would harm her and that her food was poisoned. She died with a high fever. Hæmorrhages were found in brain and spinal cord.

Barham, in 1912, recorded the case of a woman, aged thirty-four years, in whom "emotional conflict, alcohol, myxœdema and insane heredity" played a part. She recovered from psychosis twice.

Stanfield, in 1912, reported the case of a woman in whom myxœdema developed after much child-bearing, and who had excessive sexual desire. The patient recovered when extract of thyroid gland of sheep was given.

French, in 1918, mentioned, in a lecture to students at Guy's Hospital, two cases of myxœdema in women. In one case there was much somnolence punctuated with acute maniacal attacks; in the other there were headaches, vomiting, and somnolence, suggesting tumour of the brain for which trephining was done with fatal outcome. Necropsy revealed an extremely small amount of thyroid tissue.

Uyematsu, in 1920, reported the case of a woman with myxœdema and psychosis in which the patient was less active but was irritable, untidy, forgetful, somnolent and vertiginous. She wandered on the streets, was accusing, and threatened suicide. He reported a pathological study.

Claude and Bernard, in 1924, published the case of a woman, aged fifty-three years, with myxœdema, ideas of persecution, visual hallucinations and anxiety, who finally became depressed and self-accusatory. They felt that the myxœdema had a part in the onset of the disease.

Jacobi, in 1929, reported the case of a woman, aged thirty-one years, in whom, after thyroidectomy, psychosis developed; hebetude, staring, and catatonic-like features were associated. She heard music, had illusions, and presented a clinical picture resembling schizophrenia.

Kraepelin referred to myxœdematous insanity. Clouston, in 1904, described eight cases. Wagner von Jauregg, in 1912, expressed the belief that 15 per cent. of patients with myxœdema have psychosis. Curschmann, in 1918, and Deusch, in 1919, considered the relation of the climacteric to the development of myxœdema and reported, respectively, five cases and one case.

One may conclude from the foregoing that the various types of psychosis associated with myxœdema are not specific, and that they present a wide range of symptoms. However much one desires to ignore or minimize the significance of heredity, it seems fairly established that the qualities of siblings resemble each other more than do those from an unrelated group selected at random. Siblings also bear significant similarity to the attributes of their progenitors.

There are probably latent hereditary tendencies in all of us which undue circumstances may bring to the fore. The total 'make-up' (personality*) of life-long standing may, by the confluence of conditions, be exaggerated rapidly, intensified, or replaced by another (latent) pattern of behaviour, sometimes to the bewilderment of the patient, his friends and associates. Although no effort is made in this paper to demonstrate the relationship of any certain type of psychosis to myxœdema, the latency and relativity of certain factors of hereditary and personal 'make-up' are exemplified in the following cases.

REPORTS OF CASES.

CASE 1. A married woman, aged forty-nine years, first came to The Mayo Clinic in June, 1929, complaining of tiredness of six or seven years' duration. She always had been serious-minded, capable, quiet, good-natured, sometimes fearful, willing to take blame in situations which had not turned out properly and to which she was a party. A maternal uncle had been sent to an asylum following financial reverses. A brother of the patient at times had been very suspicious and had for considerable periods felt that attempts had been made to poison him. He had never been in a hospital. A brother had died of goitre. The patient had married a teacher when she was forty-three years of age and married life had seemed happy except for conditions to be recorded later. She had gone through the menopause eleven months before the examination. At the age of forty-three years, she had noted bulging of the eyes, tachycardia, restlessness, palpitation, loss of weight and strength, and other symptoms characteristic of exophthalmic goitre. At the age of forty-five years, she had been given sixteen treatments by roentgen rays to the thyroid gland. Following this, she had become "cold-blooded" (required room temperature of 80° F. to be comfortable); she was tired as before, and sleepy. Her legs ached; she gained weight, had a dry skin, œdema of the face and body, and was very sluggish.

The patient's condition was recognized as myxœdema and desiccated thyroid gland was given, but she felt that it caused abdominal distress and irritability, and she discontinued taking it for long periods. In the autumn of 1928, when the patient was aged forty-eight years, she began to feel that her husband was paying attention to another woman and that he was trying to do away with her by means of gas or the electric chair. During a game at a party in her own home during the holidays of 1928, she refused to sit in a chair designated for her, thinking it might be a plot to kill her. She also felt that her husband was trying to poison her and refused to take desiccated thyroid gland at home on account of such a belief. On several occasions subsequently, when desiccated thyroid gland was administered in sufficient quantity, at the repeated and urgent request of her physician, the delusions entirely disappeared and she felt so much better that she concluded that it was foolish to be taking medicine and discontinued taking it. On such occasions, the psychosis would slowly return in the same form as before. There were periods in which the psychosis was in evolution or dissolution when she was uncertain whether the so-called delusion was a product of her imagination or a real fact to be contended with. At the height of the psychosis she was always convinced of her husband's infidelity and attempts on her life by poison. At these times, she wished her physician to analyze her body or blood in order to detect the injurious poison or gas.

The facies and appearance were characteristic of myxœdema. The patient's weight

* Exemplified to some extent by such facts as may be elicited by the Amsden-Hoch personality outline.

was 193 pounds (the average normal weight had been 155 pounds); her skin and hair were dry; she had a bass voice; the pulse rate was 68; the systolic blood pressure was 120 and the diastolic pressure 90, measured in millimetres of mercury; the body temperature was 97.4° F. There was absence of free hydrochloric acid from the contents of the stomach after a test meal. The concentration of hæmoglobin was 77 per cent. (Dare); the Wassermann reaction of the blood was negative; examination of the ocular fundi gave negative results; old interstitial keratitis was present. Roentgenograms of the thorax, stomach, colon and gallbladder did not reveal signs of abnormality. Roentgenograms of the lumbosacral portion of the spinal column gave evidence of some hypertrophic arthritis. The few remaining teeth appeared to be infected. The thyroid gland was not enlarged. The basal metabolic rates were -40 and -34 per cent. Neurological examination gave objectively negative results except that the deep reflexes in the legs and at the tendons of the biceps brachii were like those seen in myxœdema (veratrine-like reaction). The patient was depressed. Thought and activity were much slowed. She felt certain of her husband's interest in other women and in his attempt to poison her. Her memory was adequate. She was completely oriented.

The patient was given 4 grains of desiccated thyroid gland a day. Within twenty days after she started to take the preparation of thyroid gland her delusions disappeared and she regarded them as foolish; the basal metabolic rate rose to -14 per cent. She continues to take thyroid gland and there have been no evidences of psychosis since she began to take it regularly. She calls her former delusions "foolish ideas and notions."

Summary of case.—A married woman, aged forty-nine years, about one year after the menopause, was in the depths of physiological sluggishness to which she descended in a state of marked myxœdema (after treatment by roentgen rays to the thyroid gland). She had a psychosis in which jealousy and fear of being poisoned were outstanding. She had a brother who is very suspicious and afraid of being poisoned. She recovered from the psychosis by taking desiccated thyroid gland regularly and has remained well for about a year.

CASE 2. A married woman first came to The Mayo Clinic at the age of thirty-nine years, complaining of nervousness since the age of thirty-one years and marked depression since the age of thirty-six. Her father had died of diabetes mellitus and her mother had committed suicide in depression during the menopause. A cousin of the patient suffered from depression. The patient had always been sensitive but had had reasonable energy for work. She was interested in social activities, clubs, and so forth. There was no history of outstanding infection. At the age of thirty-one years she had begun to have tachycardia, exophthalmos, diarrhœa, tremor, and slight depression. She lost 20 pounds in weight. A diagnosis of toxic goitre was made several years later and nine treatments by roentgen rays were given to the thyroid gland. Her condition improved for six months, when the symptoms gradually recurred, except that the short attacks of depression, especially during menses, were more severe. Roentgen rays to the thyroid gland at the age of thirty-six years seemed to relieve many symptoms but did not relieve the depression as it seemed to have done previously. At the age of thirty-eight she gradually grew dissatisfied, and depression came over her, which was constant. She slept poorly. Removal of tonsils only aggravated the condition.

The patient had the sluggish, sallow, pasty skin and facies and slow speech of myxœdema. The pulse rate was 72 and the concentration of hæmoglobin 80 per cent. (Dare). The basal metabolic rates were -21 and -29 per cent. Neurological examination gave essentially negative results objectively. Her thoughts and activity were markedly slowed. She wept at times, and had the feeling that something dreadful would happen.

She had a feeling of being worthless. Hallucinations and delusions were not elicited and she was oriented.

When the patient was given desiccated thyroid gland, grains 2 to 4 daily, her condition improved, especially as to the depression, and in ten days the basal metabolic rate rose to -11 per cent.

Summary of case.—A woman, aged thirty-nine years, whose mother had had severe depression, had short depressive attacks in the course of exophthalmic goitre; but when myxœdema subsequently developed severe, retarded depression appeared, which was considerably relieved by administration of desiccated thyroid gland.

CASE 3. A married woman first came to The Mayo Clinic at the age of fifty-eight years because of "nervousness, shakiness, and weak spells of a year's duration." Except that her father used much alcohol, relevant facts were not elicited in the family history. She had always been well, jovial, happy, talkative, and energetic, and despite her age, regarded herself as a young person. She was known as "the life of social gatherings in her community." She declared that she always could hear the slightest sounds and responded to them. She had always slept lightly but had never regarded herself as nervous until the onset of the present illness. She had lost 30 pounds in weight, perspired freely, and her lower extremities had become weak. She had worn less clothing since the onset of the present illness. She was dyspnoic on exertion.

The heart was rapid and palpitated. Impressions gained from the patient's history, appearance and basal metabolic rates of +16 to +29 per cent. led to a diagnosis of exophthalmic goitre, and subtotal thyroidectomy was done. The pathologist reported a hypertrophic, parenchymatous thyroid gland. She made an uneventful recovery and returned to her home, much improved, in slightly more than a month from the time she first came to the Clinic. She got along well for two months, when she began to feel cold. She had gained 40 pounds in weight, was sluggish, her tissues seemed swollen, her voice was husky, and she wished to sleep all the time. These were decidedly unnatural characteristics for her. A short time before returning to the Clinic she awakened early in the morning and thought she saw her daughter dressed in black standing beside an organ playing a dirge. She said it was like a dream. She stated that she had not been depressed. She returned to the Clinic five months after her first registration with obvious signs of myxœdema.

The patient weighed 196 pounds (average normal weight had been 157 pounds). The pulse rate was 80. Her face was swollen and puffy, her voice was husky, and she spoke slowly and was much quieter than was usual for her. Her hair was dry. Definite œdema of the arms, legs and face was present. The concentration of hemoglobin was 74 per cent. (Dare). There was moderate sclerosis of the retinal arteries. The basal metabolic rate was -29 per cent. Except for the type of deep reflexes seen in myxœdema, neurological examination gave objectively negative results.

The patient was given desiccated thyroid gland, grains 2, daily, and within a few days began to talk rapidly on any topic, jumping from one subject to another in rapid succession. On one occasion she thought she heard a radio, but no radio was near. She became restless and walked about in her room. Sometimes she would sing. She was very alert to every sound and visual impression, and any such stimulus might start a rapid stream of thought in which 'clang' association and the slightest associations in meaning set off streams of sentences (flight of ideas and rambling). She was not elated or depressed; she was oriented. When questioned, there was much verbal sparring and almost playful evasiveness. At times there was evidence of straining in the push of talk and activity, which were out of the ordinary. She declared that to maintain normal contact with the environment she continually had to make an effort in speech and activity. She felt that

her threshold of excitability had been lowered. As the basal metabolic rate approached normal she became quiet, and for about an hour one day she wept and said she felt lonesome. Subsequently she returned to her normal personality as described, and is in that state to-day, but continues to take desiccated thyroid gland.

Summary of case.—In a sociable, active, talkative, jovial woman, aged fifty-eight years, with hyperacusis and hypomanic disposition, myxoedema developed after thyroidectomy. During recovery, while she was taking desiccated thyroid gland, she became mildly manic, from which state she recovered to that of her normal personality when the basal metabolic rate became normal.

COMMENT.

In the first case it might be said that a latent hereditary disposition to suspiciousness and a paranoid trend were brought out by myxoedema and disappeared when the latter passed away. In the second case a tendency to depression, hereditary or constitutional, came out strongly with myxoedema. In the third case a mildly manic constitution was accentuated to a manic reaction without elation, while the physiological depression of myxoedema was being removed. All patients improved on the administration of desiccated thyroid gland.

Not all myxoedematous patients have depression, elation, or overactivity, nor is myxoedema an associated state in many patients who have a similar psychosis. However, thyroid deficiency appears to have had an effect of bringing into relief latent hereditary disposition and constitutional tendencies. One may conclude from the forms of psychosis associated with myxoedema that different patients react differently to the same physiological depression. Further excursions into the nature of the intimate processes of life (thought, action, and emotion) need to be made when the metabolic fires burn low. These unusual cases are so interesting that conditions, drugs, circumstances and insidious biological changes which might in any way simulate the effect of myxoedema are worthy of much study in order to understand the strata of latency which should be guarded against, as well as some which might (if unearthed) be of inestimable value to some otherwise chronically incapacitated persons. What can be done that may be comparable with the administration of desiccated thyroid gland in other types of psychosis not unlike those associated with myxoedema but not related to it? That there seems to be a correlation between physiological depression and the state of one's affects is apparent in not a few cases. That there is physiological depression, certainly at times, during many cases of psychosis also is apparent. The preceding observations again emphasize the necessity of avoiding the over-specialized study of patients, especially classifying them into 'mind and body types.' Persons who are distressed and incapacitated should be studied from every biological standpoint to ascertain the assets and liabilities which make for the presence or absence of health, vigour and usefulness. By such comprehensive regard for patients, the factors which help them to recover those feelings and capabilities with which they can be most comfortable and useful may be discovered.

REFERENCES.

- ¹ BARHAM, G. F., "Insanity with myxœdema," *Jour. Ment. Sc.*, 1912, lviii, 226.
- ² BRUCE, A. N., "Myxœdema following exophthalmic goitre: mental symptoms; death from cardiac syncope; hæmorrhage into the nuclei of both vagi," *Rev. Neurol. and Psychiat.*, 1912, x, 173.
- ³ CLAUDE, HENRI, and BERNARD, SUZANNE, "Myxœdème et psychose," *L'Encéphale*, 1924, xix, 1.
- ⁴ CLOUSTON, T. S., *Clinical lectures on mental disease*, 6th ed., 1904.
- ⁵ CURSCHMANN, HANS, "Klimax und Myxödem," *Zeits. f. d. g. Neurol. u. Psychiat.*, 1918, xli, 155.
- ⁶ DEUSCH, GUSTAV, "Klimax und Myxödem," *Münch. med. Woch.*, 1919, lxvi, 589.
- ⁷ FRENCH, HERBERT, "A series of small points: Three clinical lectures," *Guy's Hosp. Gaz.*, 1918, xxxii, 68.
- ⁸ HOOPER, J. W. D., "A case of anorexia nervosa, which later developed myxœdema, followed by safe parturition," *Intercol. Med. Jour. Australasia*, 1903, viii, 474.
- ⁹ JACOBI, E., "Myxödem und Psychose," *Arch. f. Psychiat.*, 1929, lxxxvi, 426.
- ¹⁰ VON JAUREGG, J. WAGNER, "Myxödem und Kretinismus," see Aschaffenburg's *Handbuch der Psychiatrie*, 1912.
- ¹¹ KRAEPELIN, EMIL, *Psychiatrie*, 1910.
- ¹² OSLER, WILLIAM, "An acute myxœdematous condition with tachycardia, glycosuria, melæna, mania and death," *Jour. Nerv. Ment. Dis.*, 1899, xxvi, 65.
- ¹³ RÉGIS, E., "Un cas de myxœdème des adultes avec aspect mongoloïde et psychose hallucinatoire chronique," *L'Encéphale*, 1911, ii, 519.
- ¹⁴ "Report on myxœdema," *Tr. Clin. Soc. London*, 1888, xxvi (supplement).
- ¹⁵ STANFIELD, T. E. K., *Jour. Ment. Sc.*, 1912, lviii, 234.
- ¹⁶ UYEMATSU, S., "A case of myxœdematous psychosis; clinical and pathological report," *Arch. Neurol. and Psychiat.*, 1920, iii, 252.