

STATUS THYMOLYMPHATICUS

WITH REPORT OF FOUR CASES IN ONE FAMILY *

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The condition that forms the subject of this paper can hardly be referred to as a distinct disease entity, yet it presents such a definite clinical picture, with more or less uniform pathologic findings, that it justifies classifying it as a disease state of special clinical significance.

Its nomenclature is influenced to a certain extent by the age in which the condition is observed, and by the predominance of certain clinical and pathologic features, yet as a whole the terms status thymicus, status lymphaticus, lymphatism and status thymolymphaticus are more or less synonymous. The reference further to the instances of mors thymica and thymic asthma are also closely related to this same condition.

Status thymolymphaticus is peculiar to children, but is also observed in the adult, and is characterized by a hyperplasia of the lymphatic tissues and of the thymus in association with a flabby, fat overgrowth of the body, hypoplasia of the heart and blood-vessels, particularly of the aorta, with a lowered constitutional resistance and a tendency to sudden death from trifling causes.

The four children in one family on whom this study is based, were observed by one of us (Goodrich), and presented the following clinical histories:

CASE HISTORIES

The father of these children is alive and well. The mother died of a heart and lung affection in October, 1910, some eighteen months previous to the death of the first child. In January, 1912, the father again married. In the father's family history there is a record of deaths of eight of his brothers and sisters, all under 9 years of age; three from scarlet fever, one erysipelas, one dysentery, and three from unknown causes. The mother's family history presents nothing of significance.

CASE 1.—April 8, 1912, Wyetta, the second youngest girl in the family, 4 years of age, died suddenly. For a few weeks some impairment of hearing had been noted, and her breathing had been somewhat difficult and stertorous, but this was ascribed to a cold and was treated with home remedies. About a year previously this child passed through an attack of diphtheria, during which she received 5,000 units of anti-diphtheritic serum. While she recovered very well from the diphtheria infection, she had not seemed as bright or active after this time. During a few days before her death this apathy was more marked. She manifested no desire to play and was greatly disturbed by enuresis, both diurnal and nocturnal. About midnight on the night before her death she aroused her father by an attack of choking followed by vomiting, after which she slept

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until morning. On arising she was noticed to have a pallid look. She again vomited, was put back to bed, and the physician was summoned, but he found her dead on his arrival.

Necropsy.—Examination made by D. J. Glomset, twelve hours after death.

Record: Length of body 37 inches. The lips are pale. The abdomen is rather prominent. The cervical, axillary and inguinal glands are enlarged. The limbs are plump. The subcutaneous fat is well preserved. The muscles are pale. The peritoneal cavity is free from adhesions. The pleural cavities are free from fluid and there are no adhesions.

Thymus: The thymus is prominent and covers the right auricle completely. It fills the upper part of the anterior mediastinum and lies against the trachea, but there is no evidence of pressure on the windpipe. The organ is made up of two lobes. It measures 5 cm. in length, and 6 cm. in width. It weighs 42 gm.

Heart: The pericardial cavity contains a few cubic centimeters of a serous fluid. The right heart is dilated. The orifices are normal. There is a yellowish-gray nodule on the auricular surface of the anterior lip of the mitral valve. This nodule is about the size of a millet seed. The myocardium appears normal.

Lungs: The lungs are rather boggy, but crepitate throughout. The peribronchial lymph-nodes are enlarged, grayish-red in color and moderately firm. The largest is about the size of a large bean.

Alimentary Tract: Post-mortem changes are present in the stomach mucosa. Six inches above the ileocecal valve the upper part of the bowel has telescoped 2 inches into the lower. There is a hyperemia in the outer part of the bowel, but no signs of exudate or fibrinous adhesions. A large number of the mesenteric lymph-nodes are enlarged, varying in size from that of a pea to a hazelnut. Their consistency is rather firm and their cut surface is grayish in color.

Spleen: The spleen is enlarged, lobulated, and moderately firm in consistency. The malpighian corpuscles are prominent, but apparently lessened in number.

CASE 2.—Eight days following the death of Wyetta, Louise, a bright and active 2-year-old girl, fell down the cellar steps fracturing her left clavicle. This was reduced soon afterwards by Dr. Goodrich. At this time she seemed bright and sat up in bed while the dressings were applied.

The general physical examination revealed a plump, well nourished child. The abdomen was somewhat prominent, liver and spleen not appreciably enlarged. No rachitic phenomena. The tonsils were large, and the cervical lymph-nodes were enlarged. The thymus was not palpable in the episternal notch, yet the percussion area corresponding to its location showed increased dullness. The following morning at about 7 o'clock she arose, and seemed quite well, eating, however, only a little cake for breakfast. Soon after 8 o'clock she was seized with a spasm, which was soon followed by another. Then she said she was hungry, and was given some strawberries, of which she ate quite heartily. She was then put to bed and was soon asleep. This did not last long, however, for she was shortly heard screaming. By the time her stepmother reached her she was dead.

Necropsy: Eight hours after death examination was made by Dr. D. J. Glomset.

Record: The body is very pale, a frothy liquid exudes from the mouth, and there are a few ecchymotic spots above the right eye. The cervical and inguinal glands are palpable. A trace of body heat is still present. The abdomen is prominent. Subcutaneous fat is well preserved. The abdominal muscles are pale. The muscles surrounding the left clavicle are infiltrated with blood. The clavicle is broken completely in two, one and one-half inches from the sternal end. The tonsils and adenoids are very much enlarged.

Thymus: The thymus is very prominent, covering the base of the heart and filling the upper and middle parts of the anterior mediastinum. It is composed of two lateral lobes and a central lobe, and measures 4.5 cm. in width, by 6.5 cm. in length. It is rather soft, grayish-white in appearance and weighs 54 gm.

Heart: The myocardium is soft and flabby. The right heart is dilated. There are two small yellowish nodules just above the aortic valve.

Lungs and Trachea: The mucosa of the trachea is congested, but there is no evidence of compression. A frothy fluid exudes from the cut surface of the lungs on pressure.

Liver: The liver is soft and has smooth surfaces. There are two yellowish spots present on the left border of the right lobe which extend about one-fourth inch into the substance of the organ.

Spleen: The spleen is about normal in size. It is distinctly lobulated and the malpighian corpuscles are strikingly prominent.

Stomach: Is moderately distended and contains a semifluid chyme. (This was sent to the chemist for examination, which proved to be negative.) Peyer's patches are prominent and grayish brown in color. The mesenteric glands are enlarged and range in size from that of a pea to a hazelnut. They have a moderately firm consistency.

Brain: Substance is very soft. The surface has a damp appearance. No gross pathologic changes.

CASE 3.—June 7, 1912, Walter, the only boy in the family, aged 5½ years, died in the same sudden manner as the two other children. Several weeks prior to this time, he, like his sister, Wyetta, was noticed to have some defect in hearing. On account of this, he was brought to the Children's Dispensary service of Dr. Goodrich on May 20, at which time the examination revealed a boy well nourished, sluggish mentally, having a pasty, adenoid appearance, "pot bellied"; the cervical, axillary and inguinal glands were all palpably enlarged. The tonsils were hypertrophied, adenoids were present. The spleen was moderately enlarged. The lungs were normal. The cardiac area was small. The thymus gland was not palpable in the episternal notch, but a distinctly broad area of dullness was demonstrable in the upper part of the sternum.

The urine findings were negative. Several attempts were made to obtain a blood examination, but were constantly opposed because of the fear of the simple prick with the needle that was necessary to secure the sample. A similar objection was made to an x-ray examination, or to the suggestion of its use as a therapeutic agent.

The patient was referred to the service of Dr. Pearson for a laryngoscopic and otoscopic examination, but the report was negative with regard to any abnormal findings. The clinical diagnosis of status lymphaticus was made at this time. A course of syrup of ferrous-iodid was prescribed, and the parents were admonished to watch the boy carefully for any change in his condition.

On the morning of the day of his death he seemed to be in his usual health, and had gone out into the garden amusing himself picking potato bugs off the potato bushes, when he was called inside because it was thought the sun was too hot for him. He went into the house and laid down on the bed, but said he was not sick. Soon after this on going to his room he was found to be dead. One arm had been raised over his head and a little bloody froth escaped from the mouth. His face after death, as in the other two children, had a mottled look.

Earlier in the day, this child had experienced some excitement; his sister had returned from school with her promotion card, this being the last day of school, and he became very much interested, so that he could talk of little else than of what he would do when he entered school in the fall.

Necropsy: Made twelve hours post-mortem by Dr. D. J. Glomset.

Record: Body plump, pale, and has a goodly amount of subcutaneous fat. The inguinal and axillary glands are palpable on both sides.

Thymus: The thymus is enlarged, moderately firm and weighs 25 gm. The tonsils are prominent, as are also the collections of lymphatics at the base of the tongue and in the pharynx. There is no evidence of compression of the trachea.

Lungs: There is marked edema of the lungs.

Lymph-Structures: The lymphatic structures of the small intestine are prominent. The mesenteric lymph-nodes are enlarged and moderately firm. The spleen is lobulated and the malpighian corpuscles are distinct. The heart is unchanged. The stomach and its contents were sent to Dr. F. J. Smith, professor of chemistry, Drake University Medical School, for examination as to the presence of any inorganic poison, with a negative result.

CASE 4.—July 7, 1912, just three months and four days following the death of the first, the last member of a family of four children, Florence, aged 7 years, succumbed to the same affection.

Since the death of the second child and more specially of the boy, Walter, she had been watched very carefully, not only by her family, but by her attending physician as well. She was examined frequently and presented the same physical changes that had been noted in the other children, as hyperplasia of the lingual and pharyngeal tonsillar tissue, the cervical, axillary and inguinal lymph-nodes. There was percussion evidence of an enlarged thymus, prominence of the abdomen, and a moderately enlarged spleen; the child was rather fat and flabby, had a pasty complexion, but seemed to be in good health. A blood and x-ray examination could not be made for the same reasons as in the other cases.

During the last two weeks of her life the "warning deafness" appeared. On two or three occasions in the week preceding her death, she was seized with spells in which she thought she was being choked, but recovered from them rapidly. In one of these seizures she said, "Oh, my God, someone is choking me." She then became cyanotic and sweat profusely; after recovering from it she asked her mother if she had seen all the people about her.

During the night previous to her death she became greatly alarmed because of the thunder storm then raging, but after its cessation she slept quite well. At 7 o'clock in the morning, as her father was going to his work, he awakened her, and as was his custom asked her how she felt; she replied "allright," and returned to sleep. Some two hours later she arose and went to the living room to dress, when it was noted that her head was dropped down on her chest; attempts were made to revive her but without avail and death evidently followed immediately.

Necropsy: Made twelve hours post-mortem by Dr. A. S. Begg.

Record: Body plump, pale, and has a liberal amount of subcutaneous fat. Abdomen is prominent; skin of thorax is mottled and cyanotic. The inguinal and axillary lymph-nodes are enlarged.

Thymus: Enlarged, moderately firm and weighs 40 gm. The dimensions are 4 by 5 centimeters. Marked hyperphasia of tonsils, lymphoid tissue at base of tongue, pharynx, and intestinal tract. Mesenteric nodes are enlarged. Spleen is moderately enlarged. There is some edema of the lungs. Heart is unchanged. No definite pathological change is found to account for death. The possibility of death being due to some chemical poison introduced into the stomach was excluded by a careful chemical analysis of the stomach and its contents after removal from the body.

Microscopic Examination.—The microscopical changes found in the lymph-nodes, spleen and thymus in all four of these cases are very similar and are those which occur in any chronic inflammation of the lymphatic system. There was a diffuse proliferation of the endothelial cells in all of the lymphatic structures. In Case 3 there was also an apparent increase of lymphocytes in some of the mesenteric lymph-nodes and in the thymus. In this case, however, the most marked change was an increase of the fixed cells of the lymph-nodes.

In Case 2, which is fairly typical of the others, the malpighian bodies of the spleen were partially replaced by endothelial cells. Only a few germ centers could be found in any lymph-node. There was a distinct increase in the supporting connecting tissue of the spleen and of the largest lymph-nodes. Giant cells were not to be detected.

In the second case there was also a rather marked degree of myocarditis, and in two of the children there was a diffuse atheromatous change in the aorta

of one, and on the mitral valve of the other. Hassall's corpuscles were prominent in all the thymi. There was a homogenous degeneration of the centers of some of the corpuscles of Hassall.

SUMMARY OF CLINICAL AND PATHOLOGIC FINDINGS

1. All the cases presented the same symptom-complex: pasty complexion, a flabby fat overgrowth, hypertrophied tonsils and adenoids, enlarged cervical, axillary and inguinal lymph-nodes and signs of an enlarged thymus; all were bottle-fed and had the "pot belly" of the rachitic.

2. Three of the four had a preliminary deafness.

3. Three of the four had seizures of choking or attacks suggesting thymic asthma.

4. All were apparently well nourished.

5. In all no malady sufficient to cause death was noted clinically.

6. In all cases death occurred before the arrival of a physician and under very similar circumstances.

7. No other similar cases are known among the playmates or friends.

8. All were of nervous temperament and became easily excited.

9. One child had diphtheria in 1911 and was given 5,000 units of antitoxin, the other three children receiving at the same time 1,000 units each for prophylactic purposes.

10. The post-mortem findings were practically identical in the four cases: the lymphoid hyperplasia and enlarged thymus prevailed in each. The weight of the thymi were, respectively, 42, 54, 25 and 40 gm.

11. The histologic changes found in all of the cases are extremely suggestive of a chronic inflammation affecting principally the lymphatic tissues. Whether this chronic inflammatory reaction has been produced by poisonous substances formed in some other part of the body or eliminated by some unknown micro-organism affecting the lymphatic tissues, is difficult to say.

12. It is difficult to conceive that the enlargement of the thymus was the main causative factor in the deaths of the children.

GENERAL CONSIDERATIONS

All discussions of status thymolymphaticus center about the conception of the pathological physiology of the thymus, and to a lesser degree of the lymphatic apparatus.

Sudden death has been frequently associated with thymic enlargement, the earliest mention of this fact being made by Plater in 1614.

All consideration of congenital and infantile stridor, asthma and sudden death has given to thymic enlargement, whether associated with coincident enlargement of the lymph-node or not, a clinical interest of considerable importance, about which an interesting controversy has been waged for a long time.

Paltauf¹ increased our knowledge of the subject when he described in 1889 a lymphatic constitution; he associated with status lymphaticus a hyperplasia of the heart and arterial system, and ascribed to it the condition of lowered resistance and increased tendency to fatalities in the various acute infections.

In a recent contribution on the pathology of the thymus by Wiesel² and the clinical discussion of status lymphaticus as exhaustively considered by H. Matti,³ a most comprehensive view of the subject is obtained.

The anatomical status of the thymus cannot be said to be definitely fixed. Originally an epithelial structure, these elements gradually undergo various retrograde changes, but the epithelial remnants persist in the connective corpuscles of Hassall. At birth the lymphoid character of the organ is so marked that it is usually classed with the lymph-nodes. Some class it with the ductless glands; others place it without question among the lymphoid organs.

In many ways the thymus may be regarded as a homologue of the tonsils.

The estimation of thymus enlargement is subject to more or less error. Dudgeon⁴ places the average weight of the thymus at from 7 to 10 gm. from birth to 2 years of age; Hart,⁵ Friedleben⁶ and Rolleston⁷ also conclude that the acme of growth is reached by the end of the second year, then undergoes retrograde change, yet may remain stationary until puberty, which is followed by rapid physiological involution.

Glands weighing 20 to 30 gm. must be considered as enlarged.

The following tables of weights as collected by three different observers represent the variations peculiar to statistical studies:

Hammer*		Friedleben*		Von Sury*	
Age	Wt. Gm.	Age	Wt. Gm.	Age	Wt. Gm.
New-born	13.26	1 yr. 9 mo.	20.7	New-born	14.4
1-5	22.98	9-24	27.3	1 mo.	15.
6-10	26.10	2-14	27.	2-9	24.3
11-15	37.50	14-25	22.1	9 mo. 2 yr.	23.3
16-20	25.58	25-33	3.1	2-14 yr.	25.
21-25	24.73	.....	.....	.....	.....
26-35	19.87	.....	.....	.....	.....
36-45	16.27	.....	.....	.....	.....
46-55	12.84	.....	.....	.....	.....
56-65	16.	.....	.....	.....	.....
66-75	6.	.....	.....	.....	.....

1. Paltauf: *Wien. klin. Wchnschr.*, 1889, ii, 877; 1890, iii, 172.
2. Wiesel: *Pathologie der Thymus. Ergebn. v. Lubarsch-Ostertag 15 Jahrg.*, 1911, Suppl. 2, p. 416.
3. Matti: *Ergebn. d. inn. Med. u. Kinderh.*, 1913, x.
4. Dudgeon: *Jour. Path. and Bact.*, 1905, x, 173.
5. Hart: *Grenzgeb. d. Med. u. Chir.*, 1909, 0, 321.
6. Friedleben: *Physiologie d. Thymusdruse*. Frankfurt, 1858.
7. Rolleston: *Clin. Jour.*, 1898, xiii.
8. Hammer: *Arch. f. Anat. u. Physiol. Anat.*, Suppl., 1906.
9. Von Sury: *Vrtljschr. f. gerichtl. Med.*, 1908, xxxvi, 88, Series 3.

Hammer's weights are regarded as too high, and were mostly compiled from cases of accidental deaths. Lubarsch¹⁰ claims that status thymicus is very rare in the new-born and young children.

Status thymico-lymphaticus is more frequently observed in older children and adults, thus strongly suggesting that it is an acquired post-natal condition.

The primary cause of thymic enlargement may be sought in any infection, intoxication or disturbance of metabolism, in which there is a



Fig. 1.—Photographs of the four children taken in October, 1911.

lymphoid or myeloid exhaustion. Sahli considers it a criterion of nutrition in infants, associating it with apparently well-nourished pasty children.

The enlargement of the thymus may be regarded, therefore, as a secondary process of the nature of a compensation.

10. Lubarsch: Jahreskurse f. Arztl. Fortb., 1912, p. 56.

It may be associated with or without lymphatic enlargement. In the same light we are reminded of the observation of Kolisko¹¹ that the mesenteric glands and lymphoid tissues of the intestinal tract are often so prominently enlarged in enteritis of children as to completely obscure the primary inflammatory process.

In the anatomic findings of the four cases included in this paper, there is revealed principally a lymphoid and fibrous tissue hyperplasia that is very suggestive of a reactive process to some form of irritation.

The familial tendency peculiar to our cases has been noted by a number of other observers, Hennig,¹² Friedjung,¹³ Perrin,¹⁴ Hedinger,¹⁵ Griffith¹⁶ et al. Hedinger reports an instance in which five members of a family of nine children died suddenly, one of which came to autopsy with the usual findings of status lymphaticus.

Perrin reports in a family of eleven, nine children, and Griffith seven children in one family, from 1 to 8 months of age, who died suddenly with symptoms of dyspnea and cyanosis.

There is no record in the literature of any definite hereditary transmission of this condition.

Our knowledge of the physiology of the thymus is largely based on the experimental work that has been done, principally as the result of thymectomies in animals. The most extensive work is that of Klose and Vogt¹⁷ and H. Matti,¹⁸ from which the following facts are obtained,

Thymectomized dogs present several distinct stages:

1. A latent period of two to four weeks, during which there is no appreciable change.

2. A stadium adipositas continuing two to three months.

3. A stadium cachecticum of three to four months' duration.

4. Death usually within a year.

In addition, a marked change is noted in the general condition, the nutrition is retarded, growth is arrested and bony changes occur very similar to those of rachitis.

There is evidently a distinct connection between thymectomy and the process of ossification.

The removal of the thymus has a depressing influence on the sexual apparatus. A hyperplasia of the thyroid gradually occurs and also some hyperplastic change of the adrenals, hypophysis and pancreas.

11. Kolisko: *Handb. d. Aerzt. Sachverst. Tätigkeit*, 1906, ii, 701.

12. Hennig: *Gerhard's Handb. d. Kinderkrankh.*, 1893.

13. Friedjung: *Grenzgeb. d. Med. u. Chir.*, 1900, iii, 465.

14. Perrin: *Ann. de méd. et chir. inf.*, 1903, vii, 217.

15. Hedinger: *Deutsch. Arch. f. klin. Med.*, 1905, lxxxvi.

16. Griffith: *New York Med. Jour.*, 1909, xc, 444.

17. Klose and Vogt: *Beitr. z. klin. Chir.*, 1910, lxxix.

18. Matti: *Grenzgeb. d. Med. u. Chir.*, 1912, xxiv, 665.



Fig. 2.- The two older children (Cases 3 and 4). Photograph taken in April, 1912.

In the injection of thymus extract, Svehla¹⁹ has demonstrated a pressor substance. Vincent²⁰ and Popper²¹ report similar results, while Oliver and Schafer²² and Morehead obtained negative results.

Thymus feeding has not led to any definite results, and the third attempt to produce a state of hyperthymization by means of thymus transplantation, carried out mainly by Sommer and Florken²³ and Ranzi and Tandler,²⁴ has also not given any reliable or uniform results.

From the experimental results reported, it is evident that dethymization is attended by rather definite systemic disturbances, particularly in the process of ossification and growth of bone, but the opposite state of hyperthymization is by no means as clearly defined.

The apparent association with the chromaffin system is evident, and in the opposing as well as controlling influence of thymus extract on the secretion of the other ductless glands, there is strong suggestion of a separate internal secretion of the thymus, yet it still lacks much corroborative evidence.

In connection with the hyperplastic changes in the thymus and the lymphatic apparatus, some interesting findings have been observed in other organs.

Wiesel refers to the presence of thyroid enlargement in status thymicus. The association of Basedow's disease with status thymolymphaticus has been demonstrated in a large number of instances by Capelle.²⁵

The larynx is often small and of the heterosexual type.

The hypoplasia of the aorta, as well as its branches, and the small heart have been referred to. Von Neusser²⁶ has called attention to abnormal length of the bowel and atypical lobulation of the lungs. Shiota²⁷ has reported the occurrence of an abnormally long appendix vermiformis. Wiesel²⁸ has found hypoplastic adrenals in well-marked examples of this condition, and the interesting contribution of Hedinger²⁹ corroborates the coincidence of Addison's disease with status thymolymphaticus.

In a careful study of fifteen cases of Addison's disease he found eight instances of status lymphaticus, four cases of status thymolymphaticus

19. Svehla: Arch. f. exper. Path. u. Pharm., 1900, xliii, 321.

20. Vincent: Arch. Physiol., 1904, xxx, 16.

21. Popper: Sitzungsber. f. Acad. d. Wissensch. Wien., 1905, cxiv, 539.

22. Oliver and Schafer: Cited by Matti, *Ergebn d. inn. Med. u. Kinderh.*, 1913, x; Morehead: *The Practitioner*, 1905, lxxv, 733.

23. Sommer and Florken: *Sitzungsber. d. physiol. med. Gesellsch. Würzburg*, 1908, 3 and 4, p. 45.

24. Ranzi and Tandler: *Wien. klin. Wchnschr.*, 1909, xxii, 980.

25. Capelle: *München. med. Wchnschr.*, 1908, p. 1826.

26. Von Neusser: *Zur Diagnose der Status thymico-lymphaticus*, Wien, 1911.

27. Shiota cited by Matti: *Ergebn d. inn. Med. u. Kinderh.*, 1913, x.

28. Wiesel: *Virchows Arch. f. path. Anat.*, 1904, clxxvi, 103.

29. Hedinger: *Frankfurter Ztschr. f. Path.*, 1907, i.

and three cases incomplete. These observations have been corroborated by Warthin,³⁰ Pappenheimer³¹ and others. Bartel³² has associated glioma of the brain with the condition under discussion. Marie³³ found acromegaly with status thymicus. Von Recklinghausen reported the presence of status thymolymphaticus in a case of osteomalacia.

The association of a lymphatic constitution with rachitis has been frequently emphasized.

The sudden death in status thymolymphaticus, which forms such a tragic chapter in this condition, has been variously explained, and continues to be a problem of considerable controversy and discussion.

The several theories that have been proposed may be grouped as follows:

1. Mechanical: pressure of enlarged thymus on the trachea or contiguous blood-vessels, causing stridor, asthma and death.

2. Intoxication due to faulty tissue changes similar to the action of syphilis on the heart muscle (Paltauf).

3. Hyperthymization resulting from pathological increase of an internal secretion, both of the thymus and of the lymph-nodes.

Paltauf's explanation has been largely discarded in view of the lack of any supporting evidence.

The mechanical theory is also not sufficient, as so many of the cases show no previous signs of thymic asthma.

Until the existence of an internal secretion has been more definitely demonstrated, it will not be consistent to attribute thymic death to a state of hyperthymization. On the other hand, a critical review of the literature, giving due consideration to all anatomic relations, a mechanical thymus death by tracheal compression, in rare instances also by compression of the blood-vessels, is a distinct possibility, and in a number of instances has been definitely proved to be the cause of death.

Birchner³⁴ has demonstrated by experimental means the toxic effects of injections with pathologic thymi.

In adults a cardiac death is the rule, and it seems proper to refer to a "thymic heart" in the same sense that the term thyroid heart is used.

Again, it is not so much the thymic hyperplasia as the coincident unfavorable factors that attend this state, which are probably largely to blame for the fatal outcome. The death is often induced by a number of influences that have no effect on the normal individual.

30. Warthin: *Arch. Pediat.*, 26, 1909, xxvi, 597.

31. Pappenheimer: *Jour. Med. Research.*, 1910, xxii.

32. Bartel: *Wien. klin. Wchnschr.*, 1908, 783.

33. Marie: *Gaz. d. hôp.*, 1893, lxvi, 202.

34. Birchner: *Centralbl. f. Chir.*, 1912, No. 5, p. 138.

DIAGNOSIS

The recognition of status thymolymphaticus should present no difficulty, since the associated symptom-complex is usually so well defined. Unfortunately, in the past the attention was not directed toward these unfortunate patients until after a sudden death had occurred.

It should be possible to detect complete as well as incomplete types before the fatal exitus manifests itself.

TREATMENT

This resolves itself into prophylactic and curative. Under the former should be emphasized:

1. Avoidance of excitement.
2. No surgical operation unless absolutely necessary, as these patients do not take any kind of anesthetic well.
3. Very warm or very cold baths are to be avoided, as the shock has been known to cause death. Cases of sudden death while swimming may be ascribed to this cause.
4. Prevention of infection, especially of the upper respiratory tract.
5. Securing good hygienic conditions of life.

As regards the curative treatment of status thymolymphaticus, it can hardly be considered as curative in its true sense, since it is more of an attempt to treat and relieve certain symptomatic manifestations of the condition. A medicinal or internal form of treatment is not applicable at all. Of the non-medical therapeutic measures, mention should be made of the following:

1. Intubation with a long tube reaching to the bifurcation of the trachea, being of special value in cases of thymic pressure.
2. Thymectomy, partial or complete, is an operation of considerable surgical risk, yet carried out successfully by Rehn,³⁵ Veau and Olivier,³⁶ and more recently by Jackson³⁷ in this country.

This operation has for its purpose the relief of thymic pressure and removal from the system of the toxic influence of a pathological thymus.

3. Radiation. The use of the Roentgen ray has been espoused by Friedlander,³⁸ Heinecke³⁹ and Regaud and Cremieu,⁴⁰ and all report brilliant results in producing involution changes in the enlarged thymus. This agent will be equally effective in reducing the size of the spleen and the hyperplastic lymph-nodes.

Because of greater safety and evident efficacy its use is to be recommended.

35. Rehn: *Arch. f. klin. Chir.*, 1906, lxxx, 468.

36. Veau and Olivier: *Jour. de méd.*, March 15, 1912.

37. Jackson: *Jour. Am. Med. Assn.*, 1907, xlviii, 1753.

38. Friedlander: *Arch. Pediat.*, 1911, xxviii, 810, No. 10.

39. Heinecke: *Grenzgeb. d. Med. u. Chir.*, 1905, xiv, 21.

40. Regaud et Cremieu: *Thèse de Lyon*, 1911.