

J. Brown Lester, M.B. & C.M.

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80 Queen Victoria Street.

Cape Town

South Africa



RHEUMATISM IN THE FIRST TWO
DECADES OF LIFE

Introduction

Historical Sketch

Etiology

- (a) Chill
- (b) Heat and dryness of air
- (c) Heredity
- (d) Injury and physical fatigue

The Pathology and morbid Anatomy

Macroscopic

Microscopic

Clinical Manifestations

- 1. Sore throat
- 2. Chorea
- 3. Growing pains
- 4. Pain in joints - Anthritis.
- 5. Cutaneous eruptions and sub-cutaneous nodules
- 6. Lesser manifestations
 - (a) Anaemia
 - (b) Nervous irritability
 - (c) Headaches
 - (d) Gastric disturbance and diahhhoea
 - (e) Acute rheumatic affections of serous membranes

TREATMENT

Summary and conclusions.

" My belief is that if in this Country there exists such a thing as a special disease acute rheumatism is one, as all who study children and post-mortem examinations upon fatal rheumatism will, I think, agree "

Poynton.

Among the many subjects in the ever extending scope of a general practitioner's work there are few that demand more serious consideration than a study of the manifestations of rheumatism as seen in childhood.

Goodhart reminds us that it is in these so-called trivial diseases, the common objects of medical practice, that our risk comes of falling into indifference, that is, into death.

The frequency with which one meets with the condition in general practice - 65% of cases occurring below 13 years of age (Osler), the effects of such far-reaching significance, and the varied clinical evidences, are ample excuse for undertaking a thesis on the subject.

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Its importance is accentuated by the fact as pointed out by Stephen Mackenzie, that 79% of children have affected endocardia, when they come under treatment, in first obvious cases.

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The occurrence of the disease falls chiefly

on the joints, in adults, whereas the joints suffer in children, while the chief brunt of the disorder is borne by the heart, the myocardium, the endocardium, and the pericardium, and it is because rheumatism attacks these cardinal structures, which so often impair the future life of the child, that it is so grave a disease, and it is well worth studying under its many evidences.

The troubles which surround the Practitioner at the outset lie in the obscurity of the symptoms, the varied clinical evidences and the doubtful etiology, an element which renders treatment, except in its broad principles, so unsatisfactory.

The task is rendered more difficult still by the frequent failure of the public to understand the true nature of the disease, and its serious consequences.

By constant study, the obscurity surrounding the subjective symptoms will become eliminated. Recent investigations have thrown considerable light on the etiology. Clinical and experimental work has gone far in strengthening the microbic theory of the causation of the disease. This, however, is not yet generally accepted.

The progress of scientific knowledge amongst the public, and the greater care of the well-being of children will tend to lighten the task.

The aim of this thesis is to give some account of the work done on the subject, with particular regard to clinical manifestations and to give the results of personal observations in a series of cases.

HISTORICAL SKETCH

We glean, from the writings of early authors, that the distinctive features of acute articular rheumatism were known to them but they were not plainly distinguished from other members of the arthritic group until Baillon differentiated gout from rheumatism in 1642. 3

Sydenham gave the first valuable account and explained how the affection wanders from joint to joint, in 1670.. 4

Cullen was the first, in a somewhat more prolonged account to lay emphasis on the fact that rheumatic joints do not suppurate. 5

Haygarth makes no mention of cardiac affections in a long essay he wrote on Rheumatic Fever in 1805. These were left to be described by several memoirs appearing between 1808-20 but their writers supposed them to be 6

accidents in the disease.

In 1836, Bouilland was able to demonstrate, with the introduction of auscultation, that pericarditis and endocarditis were present in so many cases of acute rheumatism and were essentially a part of the disease itself and that they could not be looked upon as mere accidents.

7

The account of subcutaneous nodules by Maynel of Lyons in 1875 is the most important date in the history of Rheumatism, followed by the introduction of salicylic compounds by Maclagan in this Country, in 1876, and by Buss in Switzerland.

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In 1877, diplococci, bacilli and streptococci in rheumatic joints were described by Mantle and in the next year a few observers on the Continent found organisms in acute Rheumatism.

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Achalme first found his bacillus in 1891.

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In 1894 observers in France, Italy and Germany described organisms seen in joint fluids and blood of patients with acute and "chronic" rheumatism.

In 1895 the epidemic character of the disease was shown by Newsholm in his Milroy

12

Lectures.

In 1900 a description of the diplococcus rheumaticus of its pathology and effects in rabbits was given by Payne and Poynton and 13
 later Singer shewed it in the blood, in 1901, 14
Shaw by taking cultures from a case of rheumat- 15
 ic pericarditis produced lesions in monkeys.

The Pathology and bacteriology of Rheumatism stands very much where it did in 1908, and the principal progress has been made in the various lines of treatment, which have been adopted, such as the injections of salicylates directly into the joints by Santini in 1904 ; 17
 in the giving of serum. Menzei maintains to have 16
 met with some success but Poynton not.

In 1907 Parsons working with preparations of vaccines asserts to have, out of 47 cases treated, cured 32 patients.

In 1910 Zurich and Schlichold made enquiry into the effects of tonsillectomy and found that though the tonsils may appear healthy on the surface, the tissues beneath are swarming with organisms. They claim out of 125 cases 98 cures.

ETIOLOGY

Taking a retrospective view of the gains in our knowledge of the rheumatic process

during a period of two decades one can say that the greatest benefit is the recognition of acute rheumatism as one of the infections and the understanding and frequency of the fibrous tissues of the body becoming affected, constituting chronic rheumatism. All the many theories of the exciting causes of rheumatism, the neurotic explained by J.K. Mitchell, the chemical-poison by lactic acid by Prompt and Fuller, poisoning by uric acid by Haig, and the Toxaemic theory, may be said to have given place to the infective theory though the actual organism remains under debate.

Poynton and Payne and others taking materials acquired from joint lesions, blood, endo, and pericardium, pleurisy and exudates, nodules, angina, chorea, and urine, have all got the diplococcus rheumaticus, either in pure culture or contaminated with other organisms, the principal one of which is the streptococcus pyogenes.

In the hands of these competent reporters, the organism has been found to conform to all the requirements of Kochs Law, by being grown on artificial media, producing in animals, by inoculation, lesions identical with those found in acute rheumatism.

Bullock in Allbutt's system of Medicine 21

contradicts this.

Poynton and Payne, however, state that the diplococcus is the cause of rheumatism.

20

Recently it has been shown that the opsonic index for the streptococcus and diplococcus remains the same for both throughout the attack of rheumatism, hence both may be present in an affection. It is disappointing to note that bacterial investigations on even such a characteristic feature of rheumatism as the subcutaneous nodule has not given uniformity of result.

22

It is of some assistance, therefore, to turn to the well recognised predisposing and exciting causes of rheumatic affection:-

- (a) chill
- (b) heat and dryness of air and soil
- (c) heridity
- (d) injury and physical fatigue.

(A) CHILL.

This forms one of our best examples of a well recognised predisposing factor in the causation of a rheumatic attack, both by the Medical Profession and the public.

Cheadle says that in 50% of cases this exciting cause is at work.

23

It is of interest to note in passing

the various theories which at one time or another have been brought forward to account for this:-

The lactic acid theory brought by Prout 24
Fuller, Senator and others which led to the experi-
ments of Foster upon diabetics, in 1871; the 25
uric acid theory of Haig, Cullen and Mitchell
and Constatt's vaso-motor and nervous theories,
all of which have become quite old in the light
of the knowledge of infection, immunity and the
experimental work which have shewn that there is
no retention of lactic or uric acid in the
system prior to the rheumatic attack.

(B) HEAT AND DRYNESS OF THE AIR AND SOIL.

It has been shewn by the statistical 26
work of Lange, Gabbett and others, that the pre-
disposing factors due to soil and meteorological
conditions reached their greatest during a period
of high mean temperature and drought i.e. due to
increased production and distribution of organisms
Secondly, That epidemic outbreaks are independ-
ent of atmospheric conditions - a fact which one
can easily understand when one considers that one
is dealing with two variable factors, the infectiv-
ity of the micro-organisms, and the resistance
of individuals .

A few words with regard to incidence,

sex and age.

May and November are said by Hutchison to be the months of greatest frequency, and other observers think September and October are more correct.

Cheadle (Allbutt's system Vol 11, part 1, page 647) says it occurs more often in males than females.

27

With regard to age, 20 to 30 is undoubtedly the age of greatest prevalence of Rheumatic Fever, but one wants to point out that the rheumatic cycle to be considered under Clinical manifestations - puts the majority of cases in children between 4 and 10 years.

Cases of Rheumatic Fever have been described by Adams, Ashley, Miller and others in children under one year but they are not numerous. .

28

(C) HEREDITY

A Committee of the Clinical Society found that of 1300 patients treated at the Middlesex Hospital 27% gave Rheumatic Family Histories, and Fuller states that of Rheumatic patients under 15 years of age, one in 1.9 had a Rheumatic parent. In most of the cases one has noted there is a marked rheumatic history and one would put the percentages higher in all cases of rheumatism in children, so that

in the investigation of obscure pains and symptoms in children, if a well marked family history of rheumatism is obtained it may give one the key of the position, and enable one to prevent these oversights which have such disastrous consequences to the well being of the patient.

(D) INJURY AND PHYSICAL FATIGUE

These influences must come into play in the same way that chill does, in that they lower the resistance of the individual to infection locally or generally.

PATHOLOGY and MORBID ANATOMY

The macroscopical signs of the diseased endo- cardium, pericardium, and joints are so well known that one will not stop to describe them except by briefly writing that recently these features, in so far as they affect the endocardium have been divided into three types.

- (a) Simple, i.e. thickening of valves due to dilation of vessels,
- (b) Fibrous due to contraction of fibrous tissue, produced by haemorrhages from the dilated vessels of the simple type ; (this is usually found in females)
- (c) The malignant type when organisms grow on the affected endothelium and produce ulceration.

Microscopically

In addition to these changes described

above, in the subendothelial membrane, a fibrin-like substance is seen, due to coagulation necrosis of the ground substance, upon which, as a secondary change, leukocytes and blood plates are deposited, and if the organisms are in the ascendant, the third stage of ulceration is produced.

These changes have been noted by Lewis and Longscope in enlargements of muscle tendons produced by injection of diplococcus Rheumaticus and it has been generally acknowledged that the underlying Pathological change in Rheumatism is due to an organism. 29

In 1906 Beattie added importance to this 30 by shewing amyloid changes in rheumatism. He further goes on to reply to unbelievers who insist that the morbid changes usually seen are due to terminal infection, by getting the diplococcus from the blood of a living subject, who was at the time going on with his usual business.

Again, other critics were disproved, who held that these changes are consistent with an attenuated pyaemia:-

(1) by pointing out that acute rheumatism ending in hyperpyrexia and death can hardly be called attenuated;

(2) by a series of experiments with diplococcus

rheumaticus and streptococcus pyogenes from cultures of which he produced Arthritis in animals in 60% of cases with the former, 18% with the latter, and endocarditis in 35% of the cases with diplococcus, to $\frac{1}{2}$ % of cases in which he used the streptococcus.

It is fair to decide in the face of these experiments that the morbid changes are produced by the effort of the animal to throw off the invasion of an organism, presumably the Diplococcus Rheumaticus.

CLINICAL MANIFESTATIONS

Observing one's first case of typical acute rheumatism in a child and comparing it with what one has seen in an adult, one is struck by the apparent mildness of any single symptom of the complaint in the former compared with the latter, and one is inclined to make light of it, till later experience teaches that besides these apparently trivial joint symptoms, grave cardiac mischief may be taking place, and the child, though apparently in less distress than the adult, is really the graver case of the two. A moment's consideration will convince one on this point.

Pathological investigation has shewn that organisms attack the endocardium. If,

therefore, the cells are crippled, as they are bound to be, they will be unable to grow to their natural size, hence the more delicate mechanism of the child's heart will be thrown out of gear. Besides, it is well known that the interstitial tissues one is considering grow less susceptible to attack except at the joints, where growth goes on longer, hence endocarditis becomes less frequent as the child grows older. It is probably correct, as is suggested by Garrod to regard the manifestations as being produced in two ways: (1) the local effects resulting from the focal growth of the organisms, and (2) the general action of the toxins, manufactured by the organism, after they have been absorbed into the blood.

To the first class would belong the subcutaneous nodules and the similar nodules which are the cause of cardiac inflammation, and to the second the fever, the fleeting joint pains and inflammation the erythematous rashes, the dilatation of the heart and probably the nervous symptoms.

Thus on the whole, in adults the manifestations seem to be mainly due to toxaemia, while in children they are largely focal.

A possible explanation of the difference would be afforded by the hypothesis that in adults the chief site of the increase of the organisms and the production of toxins is in the blood itself, while in children this occurs in focal lesions outside the blood stream. Where the toxins have to be absorbed into the circulation from outside they would naturally be less in amount, and would produce less violent symptoms. Unhappily, we have seldom got to deal with typical acute rheumatism in children.

As Still so well says

31

" Children's rheumatism..... is often revealed by no more than one of many symptoms" and it is one's purpose to consider these diverse symptoms. In taking them seriatim it will be noticed that the state of the cardiac system is constantly referred to. One cannot lay too much weight upon the fact that it is upon the heart that the main brunt of the attack falls in children.

(1) Sore-throat, tonsillitis, angina.

The connection between attacks of tonsillitis and acute rheumatism has long been known, James Fowler, estimating that 80% of cases of rheumatic fever have throat symptoms at first.

Haig Brown and other put this percentage too high. Hence it has been supposed by some that the infection finds entry through the tonsils. Lately Gouget in "La Presse Medicale" October 1912 calls attention to the works of various authors on the tonsils as "Portes d'entree", and the results of tonsillectomy published by Zurich and Schichold, and already referred to appear to confirm this view.

33

Still mentions that it is an ailment which no doubt often passes unnoticed. Take the case V.C. aged 18, rheumatic family history, who suffered with growing pains for four years before admission under James Fowler from October 3rd -18th 1907, and who was treated for a fortnight in the out-patient department for "sore-throat" being sent into Hospital with a systolic murmur undoubtedly due to endocarditis as her temperature was hardly above normal, all the time she was in Hospital; she is noted as being a very healthy looking girl, hence it was not anaemia, and it persisted after treatment, the patient leaving the Hospital with it. Here one must have had a case of rheumatic tonsillitis accompanied or preceded by endocarditis. In the former case, if the lesions had been recognised early enough the girl might

32

have been spared the endocarditis, as in the case of W.T. aged 17, admitted under James Fowler February 13-21st 1907 for rheumatic tonsillitis with temperature 102° Fahr, treated with salicylates and who made an interrupted recovery, no cardiac lesion resulting. It is interesting to note that tonsillectomy has been performed four years previously.

One does not intend to mean that Rheumatic tonsillitis is necessarily accompanied by endocarditis or any cardiac lesion but one wants to impress the necessity of early recognition and prompt and efficient treatment. As an aid to recognition one would mention that there are two kinds of rheumatic affection easily recognisable.

The first (likened by some observers to the primary sore of syphilis) where the tonsils are attacked by follicular tonsillitis, differing from ordinary infective tonsillitis in that (a) the tonsils are not affected alone. Fernet says "a diffuse erythematous redness is seen to occupy the whole of the back of the throat, and some oedematous swelling of the mucous membrane is present, which is most marked about the uvula, which is swollen and elongated". This affection usually precedes further rheumatic symptoms by an interval of

10-14 days.

(b) The amount of pain is out of all proportion to the morbid appearance, movements of the jaw producing as much pain as the swelling.

(c) Glands at the angle of the jaws are seldom enlarged, never to the same extent as in the suppurative form.

(d) The temperature of rheumatic tonsillitis is seldom above 101° Fahr; whereas in ordinary follicular tonsillitis, it may be 102°- 104° Fahr.

Lasengue notes this form in dividing his cases of tonsillitis into groups according to the relative intensity of the throat symptoms and articular lesions, and includes them in the third group, when angina is severe and articular lesions trifling.

35

The second form, included in Lasengue's first group, where the throat symptoms are trifling, arthritis severe, usually accompanies other rheumatic manifestations in children and is simply faucial erythema which gives rise to few or no symptoms and has often been overlooked in case with arthritis, growing pains, rheumatic dyspepsia, etc! Hence one should thoroughly overhaul the child, looking in addition for subcutaneous nodules. One has seen several cases where rheumatic nodules were present,

purpuric eruptions , enlargement of thyroid, tenderness in joints etc. There is a distinct type of feature amongst children suffering from Rheumatism. One would describe is as being lightness of build, dark hair and eye-lashes, a clear skin and a very alert expression. Even when physical examination fails to reveal any other signs of rheumatism, with an actual family history, or in any case of doubt the child should always have the benefit of anti rheumatic treatment.

(2) CHOREA

The question of the relation of Chorea to rheumatism is still uncertain, and until we have agreement with regard to the organism causing rheumatism, chorea must be considered apart.

John Thompson says in a considerable number of cases, Chorea is beyond all doubt a manifestation of rheumatism, and suggests a thorough examination for other rheumatic symptoms.

Cheadle prefers to include Chorea under rheumatism, Still calls it cerebral rheumatism - not intending thereby to imply cerebral conditions in hyperpyrexia. 36

Church says that the endo - and pericarditis are invariably rheumatic. 37

Poynton , Wassermann and Malkoff have demonstrated the diplococcus rheumaticus in the pia mater 38
39

of cases dying of chorea.

Batton has shewn that 53% at least of cases of chorea either had rheumatic manifestations or developed them within six years of their first coming under his care.

40

12% of cases have endo-or pericarditis as a complication and Caler finds that on examination of a series of cases of chorea two years subsequent to the attack, in about 48% there were signs of organic heart disease. One mentions these cases in order to impress the serious risk of neglecting the earliest sign of chorea and the necessity of adopting prompt and vigorous prophylactic measures.

41

3 GROWING PAINS

Even amongst the Medical Profession it is curious to note these pains are treated with indifference. In a discussion a few years ago, a distinguished member remarked that "true pains did not exist!" Pain is invariably associated with a morbid process, natural growth must, therefore, be painless, so that this contention must be considered as valueless.

Growing pains are analogous to influenzal pains in the adult, and are due to myositis developed by the organisms or their toxins concerned in producing rheumatism.

How often has the subsequent history shewn that cases, when neglected, led to serious affection of the heart? Take the case of H.W. a healthy looking boy aged 14, father died of rheumatic fever, had pains in calf muscles, first in one ankle then in the other, the wrists and knees, off and on for a few years before admission (under Sir James Fowler, July 14th-August 5th 1908) patient has never been laid up with them until he came into Hospital with a sub acute attack, temperature 100° Fahr., and a loud systolic murmur.

The lesson to be drawn from this, and too frequent similar cases (Brockbank published several in British Medical Journal April 28th 1900) is that if these cases had been subjected to anti-rheumatic treatment in the earlier stages we might not have had endocarditis.

However, it must not be thought that growing pains are always so straight-forward as the case mentioned above. The symptoms are frequently very obscure, being shewn by pain in curvical muscles producing wry-neck in the spine, giving rise to symptoms like spinal caries or tubercular trouble, if localised in one joint.

This is well shewn by V.C. a girl of

15 years of age, brother died of rheumatic fever, another brother also attacked, patient had pain in right hip for three weeks before admission under Sir James Fowler, December 29th 1908- February 2nd 1909, was suspected of having tubercular trouble but was not treated; patient was admitted with acute pain in the right hip, temperature 100.6° Fahr., distinct systolic murmur which persisted after patient left the hospital. She might have undergone prolonged and tedious treatment for tubercle if she had not had an attack of rheumatism, when all she required was a few weeks in bed with movement of limb instead of elaborate apparatus for immobilising the hip.

A case of torticollis is mentioned by Robert Saundby ("British Medical Journal" January 20th 1912, page 123.

42

A boy aged 12 admitted into the Birmingham General Hospital on December 14th 1912 with acute rheumatism. He had been ill 5 weeks, the joint trouble started in the left ankle, spreading to knees, shoulders and elbow. A month previous the wryneck set in. There was endocarditis present but he had never been ill before. He was put to bed and anti-rheumatic remedies given. Spasm was relieved in two days

and on January 8th he left hospital recovered, except the heart lesion. The condition is also mentioned in Anders Practice of Medicine Page 1104.

43

On again calls attention to the endocarditis which might have been avoided, if the condition had been recognised earlier.

John Thompson says in his "Clinical Examination and treatment of sick children" page 509 "a complaint of "growing pains" is to be taken very seriously"

Pichler ("Prager Medizinische Wochenschrift" June 6th 1912 page 293) points out that in every instance of disease of the upper cervical vertebrae it is as necessary to consider the possibility of rheumatism just as much as that of tuberculosis and describes two cases. The chief symptoms are pain, limited movement, swelling and wryneck. Symptoms of paralysis and spinal irritation occur in rheumatism as well as in tubercular disease. Stress must be laid in the differential diagnosis upon the presence of rheumatic symptoms in other joints or of endocarditis.

44

(4) PAIN IN JOINTS - ANTHRITIS

It should be clearly understood (a)

that Arthritis in children is, or ought to be, a rare symptom; (b) as pointed out before, it is not present in anything like the severity we find in adults and (c) that this manifestation is in very many cases due to the neglect of frequent warning to the Practitioner by attacks of tonsillitis, growing pains or some of the other symptoms one is about to consider. So that (d) it is a symptom that ought, with proper care to become rarer. Therefore, it ought to be a goldenrule that a child between four and ten years of age complaining, the joints should be suspected of rheumatism unless there is very clear evidence to the contrary. The symptoms of acute articular rheumatism in children are too well known therefore one does not mean to enter into a minute description of them. On account of the heart troubles the treatment should be far more thorough than in adults.

(5) Cutaneous eruptions and subcutaneous nodules

These manifestations usually occur in the course of an attack of acute articular rheumatism or in conjunction with some other rheumatic symptom, such as growing pains, tonsillitis, or endocarditis.

They may also occur together or separately.

The most usual skin eruptions are erythema multiforme (palpalatum) sudamina miliaria urticaria, purpura rheumatica peliosis rheumatica or (Schonken's disease) erythema marginatum and nodosum.

Carriere obtained the diplococcus from the lesions of erythema multiforme, the commonest of these skin affections characterised by slight swellings above the skin, reddish purple in colour, appearing in crops and scattered over the outer aspect of legs and extensor surface of arms. It depends on vaso-motor disturbance.

45

Urticaria is the next in frequency and the tendency towards its production is frequently shown by its appearance on administration of salicylates. It may be noted in passing, its appearance, or that of erythema, is not an indication for discontinuing the salicylates. Erythema nodosum has long been a subject of some doubt with regard to its rheumatic origin, and there seems to be a tendency for Heine, Unna and Moussons to agree with Kuhn that there are two forms, idiopathic or contagious type and a symptomatic form which is the usual Rheumatic form,

46

In 1907 an interesting case was in the wards of William Pasteur, on the first occasion with Rheumatic purpura, on the second with Erythema nodosum.

One should add that the lesions were mixed on both occasions, but her visits to the hospital are remembered by the prevailing skin affection at that time.

M.F., was admitted February 11th., discharged on the 28th. Mother had rheumatism for years. Brother had rheumatic fever and chorea at 15. For three years she had been troubled with growing pains. A fortnight before admission she had an attack of tonsillitis, temperature 100-2 Fahr., slight arthritic pains, bright spots on legs passing from a pin's head to a shilling, raised from surrounding skin, which did not disappear on pressure. Patient had mitral stenosis. On the second occasion she had an attack of tonsillitis - on a second occasion three weeks before admission, and had very tender nodes on legs and knees, and a patch the size of a shilling on each elbow. On both occasions salicylate treatment terminated the affection.

Another case was that of J.M., 5 years old, a healthy boy, rheumatic family history

Chorea one year previous to admission under Essex Wynter July 10th - August 15th, with purpuric eruption, nodes on legs below knee and papulate on trunk.

The subcutaneous nodules which are like boiled sago grains lying beneath, but not attached to, the skin, fixed to the tendon sheaths and deep fascia, covering bony prominences, particularly below the elbow, occipital sutures and along the spine.. At first they are firm to the touch but as they clear up they become softer.

John Thompson holds that their presence is serious and that the disease is progressive and that active anti-rheumatic treatment should be adopted.

Forming most important structures Cheadle says they are "absolutely and solely rheumatic"

47

Poynton has recently demonstrated the diplococcus in them and Lewis and Longscope have produced them by injecting the organism into rabbits.

48

Recently they have been described as being divided into two types, oedematous and pseudo-phlegmonous - which is only a name for the ordinary type- the former being larger,

solitary and usually fluctuating and softer.

Barlow, Warner, Carr and others consider that they are almost invariably associated with the progressive disease of the heart. 49

Still estimates that they are present in 10% of all cases of rheumatism; and he rather implies that they have not got the serious importance other observers have laid stress on; and though strongly believing that they may often be present without even a trace of cardiac disease, one does not wish to minimise the importance which is to be attached to them and the grave necessity for anti-rheumatic treatment and prolonged rest.

The case of A.B. a boy aged 12 years, no family history of rheumatism, a year ago in bed for a month with pains in the ankles. During the fortnight before admission under James Fowler, April 30th - May 27th 1907, these became worse and his right knee swollen. Temperature 100.8° Fahr., On examination he was found to have fluid and nodules lying over the right knee, a nodule over the olecranon, his external condyle and radius being unduly prominent. Other nodules in the extensors of the legs. These all cleared up within ten days of admission and he left the Hospital

with no signs of endocarditis whatever. The enlargement of the condyle reminds one of periosteal nodes, of which this case undoubtedly presented an example, as the swellings were less marked when he left the hospital.

Fuller was one of the first to describe such cases, and although he met with much opposition his views were supported.

The following case well illustrates how the nodules associated with the severe forms of heart disease. A girl, aged 14 years, who showed very well marked nodules over both elbows, which could be seen fairly easily as well as felt. She gave a history of Chorea three years ago and rheumatic pains and swellings of the ankles three months previous to this. She had mitral regurgitation and a greatly hypertrophied heart, and while in hospital developed signs of pericarditis she remained in hospital over three months, but made little improvement and she died not long after she had gone out. The nodule continued throughout the time she was under observation, but at times varied in size.

(6) LESSER MANIFESTATIONS OF RHEUMATISM

Grouping these shortly we have:-

(a) Anaemia

John Thomson says "the rheumatic poison seems to have a specially bad effect on the blood" and Still calls attention to this symptom and says if he noted the rheumatic facies one has already described, he went very carefully into the family history. In the case of H.S., a boy of three years of age with a marked family history and facies, who had been noticed to be very anaemic "for some time", the condition was not suspected to be rheumatic until patient had an acute attack, and was admitted under Dr Essex Wynter April 13. 1908 with a temperature of 101° Fahr., and on her discharge a systolic murmur remained.

(b) Nervous instability

Still speaks of some of these conditions as a sub-choreic form, conditions in which the child cannot be induced to sit quietly, is constantly on the move; twists its fingers about, and is dreadfully excited. Its nervous mechanism is easily worn out under fatigue, and it is subject to night terrors and incontinence of urine.

A well marked case of this was seen in a girl M.C. who had a markedly family history, had rheumatic fever two years before she came under the notice under William Pasteur Dec. 12th - Jan 13th 1907, repeated attacks of tonsillitis, at the time she was examined was

in a completely semi-hysterical restless mood, complained of constant pain in side, and had signs of apparent Potts Disease which might have deceived one not on the outlook; also she had no cardiac lesion, but that an enlarged thyroid was present. It is interesting to note that Clemens has called attention to this and says that it is constantly met with in rheumatic subjects. One finds it difficult to estimate the natural size of the gland.

51

(c) Headache

This symptom is usually associated with rheumatism and other anaemias, but it may be due to Myositis of the scalp, and is greatly increased by combing the hair. C.E., a girl aged 14 years, was admitted into Hospital for sub acute articular rheumatism, temperature 100.8 under William Pasteur May 9th- May 29th 1907, at the same time her brother was in hospital for articular rheumatism and pericarditis; the girl's own premonitory symptoms had been headaches lasting over a prolonged period.

(d) Gastric disturbances and diarrhoea

As is always the case with neurotic subjects, intestinal disturbances are very common.

Anything tending to upset the nervous supply to the intestine by increasing peristalsis produces diarrhoea. This is frequently the case with children.

G.D., a boy aged 14 years, in hospital under James Fowler, 26th January to 12th February 1908, no family history of rheumatism, suddenly seized with diarrhoea and vomiting, complained of pain in the right iliac fossa Temperature 103° Fahr., Follicular tonsillitis was present, which was taken to be diphtheritic until a purpuric eruption broke out, and he was put on salicylates, the rash clearing up in two days. The throat symptoms disappeared, and the patient made an uneventful recovery.

This case agrees markedly with some described by Eustace Smith and Pearson in the symptoms to appendicitis, but a mitral murmur was not present. One must be careful not to be carried too far in pushing salicylates and neglect to call in the surgeon before it is too late.

52

In the above case the evidence was abundantly clear that it was a rheumatic affection of the peritoneum. It should not be forgotten that dyspepsia is another rheumatic

symptom in a child . Fortunately it seldom occurs without some other rheumatic symptom, growing pains, tonsillitis etc.,

Essex Wynter - December 2nd, 1908 - January 4th 1909, reports the case of S.W., a youth of 19 years of age, who was troubled for 18 months before admission, with attacks of indigestion and rheumatic pains; the condition was not realised till sent to the Hospital with an acute attack of rheumatism and mitral regurgitation .

A valuable aid to diagnosis is found in the fact that in these children the reaction of the mouth is acid and not alkaline.

(e) Acute rheumatic affections of serous membranes

The primary acute affections of serous membranes must be rare. Even when one suspects that they are rheumatic they are difficult to prove. One cannot recall having seen an undoubted case of primary rheumatic pleurisy or pericarditis in a child; the case of C.D.(page 31) was very likely a case of rheumatic perityphilitis but it is difficult to say whether primary or secondary. Secondary rheumatic affections of serous membranes are common enough, rheumatic pleurisy being an

extension from the pericardium left pleural affections from 80% of the cases.

One of the best marked cases of pericarditis seen was in L.B., a girl aged $7\frac{1}{2}$ years, tonsillitis when 10 months old. At $3\frac{1}{2}$ years she was attacked with rheumatic fever which left her with combined mitral disease. Later she was brought to hospital, under Essex Wynter Sept. 3 - Jan. 7 1909 with acute pericarditis, temperature 102.6° Fahr., infarcts in the kidneys and spleen, temperature widely fluctuating 103° - 98° Fahr., Although this must have been a case of infective endocarditis, organisms were not found in the blood, and in spite of this the child recovered sufficiently to leave hospital.

Pericarditis is shown by a rub and effusion of fluid. Its recognition has an added importance, because it is always associated with myocarditis and endocarditis. The rheumatic affections of the endocardium are nearly always secondary affections to growing pains, anaemia, chorea, tonsillitis etc one has always to run over the cases related previously to understand this fact.

The signs by which one can suspect endocarditis during the attack of one of these affections are:-

- (a) Presence of murmur;
- (b) Fresh rise in temperature;
- (c) Increase in pulse rate, particularly towards night.

The earliest sign that the heart has become involved as revealed by the stethoscope is a slight roughening of the first sound, which finally tails off into a definite systolic murmur at the apex with perhaps later an accentuation of the pulmonary second sound. More rarely one detects a reduplication of the second sound at the apex. One should never wait till irreparable damage has been done to the endocardium, but prevent it by early anti-rheumatic prophylactic treatment.

TREATMENT.

It is of prime importance to make an early diagnosis, in view of the fact that failure to appreciate the true significance of the early manifestations may lead to serious delay in the treatment, until a gross lesion has made its appearance. Though rheumatism has not yet been finally proved to be due to a micro-organism, yet everything points to its being an infective disease, e.g., its occasional epidemic prevalence, its variability of type, its incidence in the young, its nervous

disturbances, and the relapses, and finally, the specific power of salicylic acid.

It is not known how the organism gains access to the child's body. There are, however, certain conditions which are recognised as increasing the susceptibility to infection, namely, a distinct family predisposition. This should be kept in view as well as the special liability of the nervous child. It is to be hoped in the near future we may get some serum as efficacious as anti-toxin is in diphtheria. Much may be accomplished by prophylactic treatment.

Where there is a strong rheumatic tendency, one would advise rest, residence on high ground, and where the climate is dry and equable. It is of importance to guard against chill and great care should be taken in Spring and Autumn which are favorable seasons for the onset of the disease.

The clothing should be woollen next the skin, Summer and Winter, and special care taken to guard against sitting in damp clothes and shoes.

One finds that dark ill-ventilated and damp houses are favorable to rheumatism and one is confident that as the housing of the poorer classes goes on improving there will be fewer cases of rheumatic fever.

It is of importance to pay particular attention to the channels by which infection may gain access to the system.

One should endeavor to secure oral sepsis by the removal of all carious teeth and if enlarged tonsils or adenoids are present and operation for their removal should be advised.

DRUGS

The controlling influence of the salicylates (in 10 grain doses every 4 hours for a child of 10 years) and aspirin, for the pain, fever and anhrthritis is well marked though their influence on the cardiac lesion doesnot appear to be very great and may be said to be mainly preventive. One has not found them so useful in chorea, as iron and arsenic.

The judicious administration , in the acute stage, of small doses of opium in the shape of Dover's powder has been found of the greatest service to allay restlessness and calm a frequent and irregular pulse, and epigastric discomfort.

It is of the greatest importance to reduce to the lowest possible level the demands

made on the heart , and consequently the most valueable part of the treatment of rheumatism is rest. To secure this end, it is necessary to obtain the co-operation of the parents. Rest in bed for weeks and months must be insisted upon, and all excitement and exertion avoided. The diet should be fluid exclusively during the febrile stage ; the processes of elimination should receive attention, and free daily action of the bowels secured.

It is in the cardiac manifestations that rest is of such sovereign importance, and in convalescence, caution is required for months to save the heart from a complete break down.

Digitatis will be required in those cases of failing compensation . The rheumatic nervous child should have school work curtailed evening work prevented and if possible an hour's enforced rest during the day.

It will be helpful to think of rheumatism as analogous to tuberculosis being an infective disease, and liable to attack children of particular heredity and special type. Overwork at school should be avoided, as also too much exercise and over-fatigue, as evidenced by headache, restlessness at night, night

terrors and general nervousness . Cessation from school work for some weeks along with small doses of arsenic, iron, or cod liver oil, should be the line of treatment adopted.

In the management of convalescence, much will depend on the co-operation of the parents and friends, to whom the true significance of the malady, and the need for prolonged rest should be explained, and finally, we should never forget the insidious attack which rheumatism makes on a vital organ, inflicting upon it in so many cases, irreparable injury.

SUMMARY and CONCLUSIONS

The subject may be briefly summarised by saying that endocarditis - the worst and most lasting of rheumatic affections - tends to appear at various points in the rheumatic cycle. Rarely it may occur first and alone but it is usually preceded by symptoms slight and difficult to recognise unless properly investigated, for example, the anaemia, dyspepsia, nervousness, night terrors, headaches and so on. Later these may become more pronounced, such as growing pains, attacks of tonsillitis, rheumatic nodules, erythema etc.,

If these fail to be recognised by the Practitioner, undoubted evidence of endocarditis

accompanied or not by chorea, or acute articular rheumatism will almost invariably follow, perhaps leaving the child permanently crippled by cardiac weaknesses, for which a conscientious man cannot completely absolve himself from blame.

It is, therefore, one's duty to bear these things in mind, to make a routine examination of the heart in all cases, and to impress on the parents and school teachers the dangers of neglected growing pains and the early symptoms of chorea.

And. v.d.B.F., coloured aged 10 years. Treated at Cape Town Free Dispensary 1907. Father no history of rheumatism. Mother's sister and a brother give a rheumatic tendency.

Two years ago had severe chorea and arthritis of the knee joints, and was kept in Hospital for $2\frac{1}{2}$ months. Isolated and extra full diet of milk ordered.

Speech was difficult and was taught various nursery rhymes to recover control. Kept in bed for two months and made a good recovery. She has at 10 years of age two slight returns of the chorea but prompt putting to bed and rigorous anti-rheumatic drug treatment followed by arsenic. No cardiac trouble was noticed sub-cutaneous nodules were noticed along the spine and over the scalp during the first attack of chorea.

Maria Sch M.F., aged 14 years, colored,
Treated at Cape Town Free Dispensary 1908. No
definite history on Mother's side. Father
gives a history of six week's illness like
acute rheumatism. At 10 years of age was
brought because of listlessness, vague pains
in joints and bloodlessness. Marks of ulcera-
tions on tonsils visible. Put to bed for a
prolonged period and with dieting and tonics
improved. At 12 years he got wet through
followed by arthritis in knees, and a well
marked tonsillitis. He developed a mitral mur-
mur but after prolonged rest in bed no perman-
ent cardiac trouble resulted.

M.P.F., European, Treated in New Somerset Hospital, Cape Town 1909. Father and Mother have both had rheumatism. The Mother has a mitral lesion. She has had frequent attacks of Tonsillitis up to seven years and then growing pains. Parents took no notice of these.

The daughter has had two attacks of Chorea one lasting two months and was admitted into Hospital. Slight mitral regurgitant murmur was noticed. I saw her later outside with pains in knees and wrists. Put to bed for six weeks. The result was good no further cardiac trouble resulting.

Two years ago was admitted with Chorea of very slight extent. Put to bed and kept quiet for six weeks. Result was good. Suffered from anaemia but with rest and tonics she has improved.

M.le R.,M. coloured, aged 8 years.

Treated at Cape Town Free Dispensary 1907.

Father and Mother both have had Rheumatism

Mother gave a history of a son aged 10 years of acute rheumatism. First came under treatment for catarrhel Enteritis when three years of age.

When six years old had growing pains and several attacks of tonsillitis. A few months later had an attack of acute rheumatism with the ankles knees and (one) elbow joints affected. Kept in bed for $2\frac{1}{2}$ months.

A mitral regurgitant murmur resulted. He has been treated for tonsillitis and anaemia on several occasions, with prolonged rest in bed and tonics. His parents are alive to possible further cardiac troubles and insist upon rest in bed when he "catches a cold".

No further heart trouble has resulted.

F.D.M., European, aged 11 years. Mother no rheumatic history. Father has had acute rheumatism on two occasions followed by a mitral murmur.

The lad has had growing pains with slight swellings in wrists and fingers.

At 9 years of age he developed well marked acute rheumatism with many joints affected.

He was treated with Sodium Salicylate and an alkali. He had a tedious illness and at the apex of heart a systolic murmur developed. His knee and wrist joints were thickened for a number of months.

With rest, tonics and massage these have gone down. The systolic murmur remains but he is told to at once report on the first sign of a return of the rheumatism.

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