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BY

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GONORRHŒAL RHEUMATISM AND GONOCOCCIC INFECTION.

By William Murrell, M.D., F.R.C.P.

The credit of first describing gonorrhœal rheumatism is usually ascribed to Sir Benjamin Brodie and Sir Astley Cooper, although neither in Brodie's "Diseases of the Joints," fourth edition, 1836, nor in Cooper's "Dislocations and Fractures" do I find any reference to the disease. Strictly speaking, there is no such disease as gonorrhœal rheumatism: it is simply a manifestation or symptom of a general gonococcic infection analogous in this respect to tuberculous and pneumococcic infections. It is a disease of the septicæmic type, and the gonococci are being constantly conveyed to different parts of the body through the agency of the blood and the lymph channels, exciting secondary local manifestations not only in the joints but elsewhere.

The site of inoculation is usually the urethra in men, the vagina or os uteri in women and the vulva in little girls. The conjunctiva is often the starting point in children, less commonly in adults. Rectal and buccal cases have been recorded on the Continent. Some enthusiasts have injected themselves subcutaneously and experimentally with cultures, and have been duly rewarded with elevation of temperature malaise, pains in the muscles and inflammation of the joints, It seems a useless and unjustifiable experiment, for as much can be learnt by simple clinical observation. The gonococcus under favourable circumstances produces its specific effects by whatever channel it effects its entrance into the body, and gonococcic infection does not of necessity involve a preceding

urethritis, although it is one of the commonest forms of origin. Incidentally, it may be noted that the gonococcus is most readily absorbed from the urethra when there is a stricture.

Returning to our gonorrhœal rheumatism, it is incorrect to speak of it as a rheumatism or even as an arthritis, for it is more commonly a synovitis with effusion into the sheaths of the tendons. It differs from rheumatism in every essential particular, and is not amenable to the same methods of treatment. The first attack may or may not be preceded by a specific gonorrhœal discharge, but when such is the case subsequent attacks may follow a urethritis in which gonococci are absent or are not readily detected, and still later there may be attacks without any urethral discharge. The interval which elapses between a gonorrhœal infection and the onset of the arthritic manifestations varies much in different cases. It may be only a few days after the first appearance of the discharge, or it may be delayed for some weeks. The onset is not sudden, and is rarely ushered in by a rigor. There is little elevation of temperature, and when it is hectic in character it is an indication that there is a mixed infection. In uncomplicated cases there are the usual indications of constitutional disturbance such as headache, furred tongue, loss of appetite, constipation and pains in the limbs, but they are transitory and never severe.

There is a common opinion that gonorrhœal rheumatism is essentially a man's disease, but it is met with quite as commonly in women, and is then usually ascribed to some other condition, such as gout or rheumatoid arthritis. Another prevalent opinion is that it is a monarticular affection, and that the favourite site is the knee. It is true that the knee frequently suffers, but that joint, from its exposed situation and from the fact of its being imperfectly covered by other tissues, is liable to arthrites of all kinds. This proclivity is not characteristic of gonococcic infection and is not more pronounced than in other diseases in which the joints are affected. The hip, wrist, elbow, shoulder and

hand are frequently involved. Certain joints not usually attacked by rheumatism may be implicated, notably the temporo-maxillary, the sacro-iliac and the sterno-clavicular. Implication of these in my experience not very common, and is certainly not seen in more than 5 per cent. of the cases. The onset is usually marked by swelling and pain, the swelling being due to the effusion of serum into the joint cavity and its surrounding tissues. There is little redness or blush on the surface, and the pain, although severe, is not comparable to that of gout or acute rheumatism. Exceptionally, however, arthralgia is the prominent symptom, and there may be little swelling or other evidences of inflammation. Metastasis is not common, and there is no tendency for the inflammation to shift from one joint to another, a point of diagnostic importance. Effusion into the tendon sheaths is of frequent occurrence, especially when the wrist and ankle are involved. The dome-shaped swelling of the dorsum of the hands is common, but is also met with in gout. Affections of the fasciæ are frequent, and the plantar fasciæ are especially liable to suffer, giving rise to flat-foot. Cases of pain in the heel, which cannot be referred to a short os calcis or to gout, are due to this cause. Another symptom is pain in the muscles, which may be mistaken for chronic myositis or rheumatism. When it attacks the lumbar fasciæ, it is readily confounded with lumbago. The effusion into the joints rarely runs on to suppuration, although the complication may occur in tuberculous subjects, and is common in pyæmic gonorrhœa. The inflammation as a rule soon subsides, but after repeated attacks the joints may be irremediably damaged, and rendered useless by fibrous adhesions. The determination of the particular joint affected often depends on some accidental cause. A man plays football a few weeks after contracting a gonorrhœa, and the disease attacks his ankles; his friend, under similar circumstances, carries a parcel to oblige a lady, and gets it in his hand. I have known it occur in a medical man in the right

wrist after a heavy "placental" case. The following may be regarded as fairly typical cases:—

An Italian waiter, aged 20, was admitted to the Hospital on February 20th. He had contracted gonorrhœa two months previously and still had a discharge. Four weeks before admission both ankles were swollen and painful, and there was much tenderness of the soles of the feet. Three weeks later his left knee became swollen and tender, and when examined was found to be distended with fluid. There was very little constitutional disturbance, and the highest temperature was 100·4°. He was kept in bed with the knee at rest on a splint. His urethritis was treated, he was placed on a low diet and freely purged. At the expiration of ten days he was able to resume work. The involvement of the plantar fasciæ was evidently determined by the nature of his occupation.

A man, aged 27, had had eight attacks of gonorrhœa without complications. An interval of six years then ensued. On February 19th of this year he contracted another attack, which apparently promised to run its usual benign course. On April 17th he had the misfortune to fall into an excavation some six feet deep in the road, striking his back on the edge of the aperture. Two days later he took part in a golf tournament. The following day he was seized with violent pains in the lumbar region which laid him up for three months. A peculiar feature in this case was that the diaphragm was involved.

In tramcar drivers the dorsum of the right hand and the plantar fascia of the right foot, with sometimes the right knee and ankle, are involved. The right hand manipulates the crank, whilst the right leg and foot apply the brake.

The determination of site is not peculiar to gonococcic infection, but is seen in gout and other arthritic conditions.

The articular manifestation is but one evidence of gonococcic infection. Since Neisser's description of the gonococcus, and especially since the demonstration of improved methods

of culture by Bumm and by Werthein, the complications and sequelæ have received much attention. There may be accompanying conjunctivitis, iritis, and sclerotitis; of less common occurrence, but well recognised sequelæ, are endocarditis, pleurisy, meningitis, neuritis, especially of the sciatic variety, and general arteritis. Many cases of arterial degeneration are due to this infection; in fact, there is no tissue of the body which can claim immunity from its attacks. Even subcutaneous abscesses are sometimes formed, gonococci being found in the pus. This, it must be admitted, is a rare complication, for the gonococcus alone rarely leads to purulent formation; on the other hand the chances of a mixed infection are great, considering the facilities which are offered for the invasion of pyogenic organisms from a gonococcic lesion.

I should like to say a few words about gonococcic iritis, for it is a subject on which there seems to be much difference of opinion. Some people even go so far as to say that this form of iritis does not exist, but this is an entire mistake. The two forms of iritis which rest on a sure and firm basis are the syphilitic and the gonococcic. The rheumatic is nebulous, and when a man comes to you with a diagnosis of gouty iritis, you had better inquire into his past history and that will probably solve the mystery. Gonococcic iritis is concurrent with the arthritic affection, or at all events comes on about the same time. I have, however, known it appear some months after the subsidence of the joint trouble and quite apart from any fresh infection.

In the case of a lieutenant in the Royal Navy, the second and sound eye was attacked with gonococcic iritis fifteen months after the cure of the arthritis and without any second infection in the interval. The determining cause was a night watch at sea with vessels steaming ten miles apart. There is one point I wish to emphasize in connection with this gonococcic iritis, and that is that the patient will in all probability be subject to a succession of attacks first in one eye and then in the other. Each attack is of less severity and of

shorter duration than its predecessor until after some months or years the disease wears itself out. The treatment consists of the instillation of atropine – gr. $\frac{1}{4}$ in $\overline{3}$ij. of water—blistering behind the ears, and the administration of mercury. I much prefer the calomel ointment rubbed into the abdomen to giving the perchloride by mouth.

In women, in addition to these symptoms, we get the effects of direct continuity of infection, such as salpingitis, metritis or ovaritis. A large proportion of cases of sterility are due to gonorrhœa. The husband has, in the past, contracted gonorrhœa, and, although free from all acute symptoms, still retains a hardly perceptible gleet which is quite sufficient to account for the mischief. These women are usually anæmic, destitute of energy, and incapable of much physical exertion. They are treated for womb trouble, and undergo curetting and other modes of treatment favoured by gynæcologists. They suffer from many of the general symptoms met with in the victims of "larval syphilis." The co-existence of a vaginal discharge, whether acute or chronic, uterine or ovarian mischief, and an inflammatory condition of one or more joints should always excite suspicion.

The connection of gonococcic infection with the invasion of tubercle is well known. In some cases of gonorrhœa the tubercle bacilli as well as gonococci have been detected in the discharge. This is probably the explanation of some cases of genito-urinary tuberculosis of the ascending variety. In man, the testicle, epididymis, prostate, bladder, or kidney may all suffer. In much the same way joints which have undergone gonococcic inflammation may at a later stage become tuberculous.

Gonococcic arthritis of conjunctival origin is common in young children. Clement Lucas has recorded a series of cases which show that ophthalmic rheumatism may attack infants either as an acute arthritis accompanied by much pain, swelling and redness, or as a subacute synovitis, with effusion. The original ophthalmia may be due to an inoculation from

the vaginal discharge of the mother at the time of birth, or in the epidemic form which occurs in children from infected towels or linen. In these cases the joint affection develops about the end of the second week from the infection. The arthritis speedily clears up and rarely leaves permanent mischief. This form of infection is rare in adults, but the following is a case in point:—

A man, æt. 25, the night porter at a large hotel, was brought to Westminster Hospital in an ambulance on Sept. 21st, suffering from what was supposed to be rheumatic fever. The history was that on the previous day, being then in perfect health, he had an attack of acute double conjunctivitis, followed in a few hours by inflammation of the right wrist and the left knee. The patient on admission had a temperature of 101·8°F., and was sweating profusely. On examination it was found that the wrist itself was not involved, but that there was considerable effusion into the cellular tissues of the dorsum of the hand, which was dome-shaped and boggy, a condition which might readily have been mistaken for chiragra. The knee was swollen, red-hot and tender, but contained no fluid. On the following day the inflammation in the left knee subsided and the left elbow and the right knee were attacked. The temporo-maxillary, sacro-iliac, and sterno-clavicular articulations were not implicated. The patient was placed on full doses of salicylate of sodium, first of the synthetic and then of the natural salt, but without amelioration of the symptoms, the temperature ranging from 100° to 102° daily for many days. There was no tonsilitis, and there was no history of syphilis, gout or alcoholism. A gonorrhœal history was suspected, but the patient denied any attack past or present, and squeezing the urethra gave a negative result. The urine was of specific gravity 1020, acid, and contained no albumin. No flocculi were at any time observed in it. There was a history, at the age of 22 years, of an attack of acute rheumatism of some weeks' duration. The œdema of the hand continuing, the fingers were carefully

examined, but no abrasion or wound could be detected, and the temperature was not of a hectic type. The eyes were treated with boracic acid lotion, but without improvement, and on October 7th, in addition to the conjunctivitis, there was much ciliary congestion. The patient having derived no benefit from the salicylates, was given in full doses first aspirin, and then iodide of potassium; but again without benefit. On the 10th, there being effusion into the right knee-joint, it was aspirated and the fluid examined, but no micro-organisms were found in the films and there was no growth in any of the media after four days. On the 18th, there was a renewed attack of acute purulent conjunctivitis of the left eye, for which a 5 per cent. solution of argyrol was prescribed, the application of which promptly relieved the inflammation. The conjunctival secretion was examined, but no gonococci were found. The patient had several subsequent attacks both of conjunctivitis and arthritis of gradualling decreasing severity, and he was discharged on November 15th relieved of all his symptoms.

This case of multiple arthritis presented many points of interest, and much difficulty was experienced in arriving at a definite diagnosis. In favour of its being acute rheumatism was the history of a previous attack, presumably rheumatic in origin, although on that point there was no positive evidence. Against this theory was the absence of an initial tonsilitis, the rebelliousness to the salicylates, the cellulitis of the dorsum of the hand, and the freedom from cardiac complications. The diagnosis of gout was not seriously entertained, and, apart from other considerations, the duration of the attack negatived that theory. From the first a suspicion was entertained that it was a gonococcic infection, and the effusion into the tendon sheaths supported that view. The absence of a urethral discharge could not be held to overweigh the general evidence in favour of that theory. The fact of gonococci not being detected in the fluid from the knee-joint could not be regarded as conclusive, and probably the conjunctival secretion

was examined too late in the progress of the case to carry much weight. It is practically certain that this was a true case of conjunctival arthritis, the conjunctivæ being inoculated with an attenuation of gonococcus.

Gonococci in the ophthalmic secretion were discovered by Darier in 1889, and demonstrated by Deutschmann in the fluid from the inflamed joints in 1890. The synovial membrane should always be carefully examined. The remote effects of the infection are probably due to gonotoxin. The purulent form may be associated with streptococci or staphylococci. The diagnosis of gonorrhœal rheumatism rests on (1) the history of gonococcic infection or on the presence of obvious gonococcic lesions; (2) the implication of certain joints not usually affected in other forms of articular disease; (3) the absence of metastasis; (4) the involvement of the fasciæ and tendon sheaths. In many chronic cases the diagnosis is difficult, and must remain uncertain. The patient cannot be made to remember whether or not he had a urethritis and if there is a history of an attack it was so many years before and so long an interval has elapsed that it is doubtful if it can be regarded as an antecedent cause. In the case of married women the difficulty is enormously increased, and it is often inadvisable to inquire too curiously into the antinuptial history of either husband or wife. Bacteriological investigation in these cases, unless the infection is recent, throws but little light on the subject. It is difficult to find the gonococci in late cases, probably because they are ousted by more robust pathogenic organisms. Gonotoxin inhibits phagocytic action, and so predisposes to mixed infection. It is well to recognise the fact that gonorrhœa is very easily overlooked in women. It is usually regarded as an acute vaginitis, but it much more frequently involves the ducts of the vulvo-vaginal glands, and the parts immediately surrounding their orifices. Unless the urethra is implicated it gives rise to little scalding or inconvenience. The greater danger arises from the fact that the cervix becomes early infected, and the

inflammation spreads upwards beyond the range of local applications. The result of gonococcic salpingitis is the sealing up of the Fallopian tubes by adhesive inflammation. These people bear no children, or at the best "one-child" women. The child is rarely robust or of good quality.

The prognosis in cases of gonorrhœal rheumatism is on the whole favourable, although from time to time cases are seen in which there is a recrudescence of the arthritic manifestations when the patient takes up his abode in a damp climate, and especially on a clay soil. The outlook is distinctly less favourable in those who have already suffered from one or more attacks of acute rheumatism, especially when there is cardiac mischief. Several cases of fatal gonococcic ulcerative endocarditis and gonococcic pyæmia have been recorded, a condition which has been mistaken for enteric fever, malignant disease of the prostate or purulent cystitis. There is one other point to remember with regard to prognosis, and that is that gonorrhœa is a much more serious disease than syphilis, that is when the latter is contracted in this country. Varieties contracted in Egypt and elsewhere abroad are apt to be particularly virulent. There is one important difference between syphilis and gonorrhœa; the syphilitic organism affords protection, although admittedly incomplete, whilst the gonococcus, not being of a robust nature, fails to maintain its influence, and leaves the unfortunate patient liable to future invasions. What is required is a protective gonococcus, but as yet it has not been cultivated.

With regard to treatment, it is easier to enumerate drugs which are inefficacious than to find those which are valuable. When the disease follows a urethritis it must be cured, and when there is a stricture that must be dilated. When the eye is the point of entrance of the poison, the instillation of nitrate of silver or of argyrol is necessary. The affected joints should be kept absolutely at rest, and hot fomentations, and poultices should be employed. A good poultice is made with equal parts of linseed meal and precipitated sulphur.

Counter-irritation with iodine or capsicum, or rubbing in a liniment of aconite, belladonna and chloroform will be found useful. In chronic cases the iodides internally in large doses may do good, especially when the pain is worse at night. The amoniated tincture of guiacum is sometimes useful, and sometimes general tonic treatment with arsenic and iron is indicated. Should the fluid show no signs of absorption the joint may be aspirated and injected with from a drachm to a drachm and a half of a 1 in 4,000 solution of corrosive sublimate or with the same quantity of a 5 per cent. solution of carbolic acid. In chronic cases affecting the wrist, wearing a tightly-fitting strap does good, probably by keeping the parts at rest. Hot air baths and electricity may be recommended, and when all else has failed, surgical treatment should been resorted to, followed by the careful selection of a suitable climatic station. For the peripheral neuritis, which so frequently accompanies or follows gonococcic infection, I find nothing better than stovain, 5 per cent. sterilised solution ten minims injected subcutaneously twice a day.

The choice of an alcoholic stimulant in these cases is a matter of some moment. To deny the patient alcohol in any form is a considerable deprivation, and is not attended with good results. Wines and other saccharated beverages are clearly inadmissable. The best drink is an antique pure Highland whisky distilled from the finest malted barley and freely diluted with water. The quantity to be prescribed and the frequency of administration is a matter for individual consideration. It need hardly be said that the ordinary public-house whisky of the silent spirit description is a powerful toxic agent. To get good whisky you must go to Scotland, and even then a certain discrimination is necessary.

In some cases of chronic gonococcic infection I have used a serum prepared by Burroughs and Welcome with advantage. I remember in particular a patient under the care of Mr. Hartridge and myself. He was 23 years of age and had contracted a gonococcic urethritis eighteen months previously.

The local discharge had long since ceased, but there were frequent attacks of iritis, first in one eye and then in the other. There was great diminution of visual acuity of the left eye. He was unable to read, but could recognise people half way across the room when the right eye was closed. The left pupil was considerably contracted and was very irregular in outline, reacting neither to light nor to accommodation. The right pupil was circular, but did not react absolutely promptly to light. For the following notes of the treatment I am indebted to Dr. F. W. Price who watched the progress of the case with much interest.

On July 3rd at 9.30 a.m. 10 c.c. of the serum were injected into the subcutaneous tissue of the right upper part of the abdomen. Half an hour later the temperature was 99°, but there was no further rise and there was no headache. On the 5th an injection of 15 c.c. was given, but this produced no reaction. On the 6th at 9 a.m. 10 c.c. were injected, and the temperature taken every hour rose steadily until 7 p.m. when it reached 100·8°, after which it subsided regaining the normal at 2 p.m. on the following day. There was a considerable amount of constitutional disturbance, and for twenty-four hours the patient was distinctly uncomfortable. On the 11th 10 c.c. gave rise to no reaction. Thinking that in all probability there was a mixed infection, on the 16th and on the 18th 10 c.c. of anti-streptococcic (polyvalent) serum were given, but produced very slight reaction. On the 19th 15 c.c. of the original serum were given, the temperature rising to 100°. On the 26th this was repeated, the temperature rising to 101·2° and not regaining the normal until twelve hours later. It was difficult to say that at the time the patient showed signs of improvement, but the ultimate result was satisfactory, for there was no return of the iritis, although previously there had been frequent attacks, and the sight in both eyes gradually improved. Incidentally, it may be remarked that under the serum treatment there was a return of the urethral discharge without any fresh exposure.

The following is another case treated with serum. The patient was a married woman, æt. 26. Some seven or eight weeks before admission she had scalding pain during micturition accompanied by a discharge, for which she consulted a doctor who ordered vaginal injections. Three weeks later the right knee began to swell, and was so painful that she was unable to bend it. On admission it was found to be two inches larger than the corresponding joint. There was some effusion, but most of the swelling was peri-articular. The temperature ranged from 100° to 102°. After some days' rest in bed and the application of belladonna, 10cc. of anti-gonococcic serum were injected into the wall of the abdomen. There was no rise of temperature or any other noticeable effect. She was then given 20cc., followed two days later by 25cc. The last dose sent up the temperature to 103°, and the patient complained of malaise and prostration. She suffered much from nausea and vomiting, which persisted for two days. No further injections were given, but there was a marked improvement in the condition of the knee, so that at the end of three weeks she was discharged with a sound joint.

The following case illustrates the necessity for care to be taken in the selection of the serum :

A flower girl, æt. 26, awoke at 4 a.m. on the morning of August 1st with severe pains in both legs. She could scarcely stand, but managed with the aid of two sticks to get to her work. Finding she could do nothing she went home again when she was very sick. She had pain and swelling in both right and left ankles and the fingers were very painful. A doctor was sent for, who diagnosed rheumatic fever. Later in the day she was brought to the Hospital in a cab. On admission her temperature was 103°, and in addition to the ankles and the joints of the fingers both wrists were affected. The right wrist, which was acutely painful, was put on a splint whilst the other joints were painted with iodine. She was given bromide of potassium and chloralamede, and a

salicylate of sodium mixture was ordered to be taken three times a day. A swab from the vagina led to the conclusion that the condition was gonococcic in origin, and she was ordered a vaginal injection of tincture of iodine, a drachm to the pint. In the course of three weeks, thanks to the energetic action of the House Physician, she was given acetate of ammonia, sulphate of quinine with iodide of potassium, ammoniated tincture of guaiacum and syrup of iodide of iron. The temperature was unaffected, reaching 102° every night, and there was no improvement in the condition of the joints. These drugs were then omitted, and on August 30th she was given subcutaneously 12cc. of polyvalent serum. There was no reaction and no constitutional disturbance. Six injections were given and there was no improvement. On Sept. 10th anti-gonococcic serum in 25 cc. doses was substituted, and there was an immediate decrease in the size of the joints. Eight injections were given and the patient was discharged on Nov. 5th perfectly well.

In the case of a child in Marie Celeste serum proved useful.

Elsie E., aged 5½, was admitted on October 18th, 1908, with what was described as rheumatism of four days' duration. She had never had rheumatic fever. The temperature on admission was 102·6. There was much swelling of the right shoulder, and there was puffiness of the dorsum of the right hand. She was put on milk diet and given salicylate of sodium every four hours. There was no fall in temperature until the 14th, when it was 100·2. The salicylate was stopped on the 16th, and the temperature rose to 102·6. On the evening of the same day we reverted to the salicylate, but the temperature continued at 100·6, and there was no improvement in the condition of the shoulder. It was suspected that it was of gonococcic origin, especially as the patient had a vaginal discharge. This was examined on the 17th, and was found to contain diplococci, which corresponded morphologically and tinctorically to gonococci. A douche of boracic

acid was used, but the joint continued swollen and tender, and its movements were much limited. On October 23rd, antigonococcic serum 10·0 c.c. was injected into the wall of the abdomen, and was followed by a slight reaction. It was repeated on the 24th and 25th, and there was a immediate improvement in the condition of the joint, the inflammation promptly subsiding. On November 3rd gonococci were still found in the vaginal secretion.

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