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Original Article

Arthritis Associated with Venereal Disease in Nineteenth Century London

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Abstract: It is well known that arthritis can be associated with venereal disease. Nowadays septic arthritis and reactive arthritis (usually classified as Reiter's syndrome) are distinguished. To place current knowledge within its historical context we reviewed the medical literature on sexually acquired arthritis in the nineteenth century and examined the medical records of London teaching hospitals from this period. We used original sources of rheumatological literature at major London libraries, including the Heberden library of the Royal College of Physicians, and visited the archives at three London teaching hospitals to review original case records and examine diagnostic registers. The first clear description of arthritis associated with venereal disease was given by Swediaur (1798/1809) in French. It became relatively common in London from 1820 onwards with 13 cases described in the literature between 1818 and 1836. It accounts for 3% of admissions at University College and St Bartholomew's Hospitals between 1835 and 1839 and also 3% of admissions at the London Hospital from 1895 to 1900. In the 50 years after Swediaur's report, arthritis associated with venereal disease seemed quite common. This may have been related to the industrial revolution or other social diseases. Historical observations suggest its evidence may vary considerably with time.

Keywords: Arthritis; Gonorrhoea; Medical history; Reiter's syndrome

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Introduction

Most cases of non-infective arthritis associated with venereal disease are currently classified as Reiter's syndrome (Fiessinger–Leroy–Reiter's syndrome) [1] or reactive arthritis. This approach needs to be placed within a historical context. Understanding the history of sexually acquired arthritis not only provides insight into early rheumatological practice but also, more importantly, shows how current views on Reiter's sydrome and reactive arthritis developed.

The relationship between venereal infections and arthritis has been known over 200 years, although its interpretation as one syndrome is recent. The first association of arthritis with venereal disease was reported in 1715 by Musgrave [2] and was also described by Astec [3] soon afterwards. The first clear description of sexually acquired arthritis was given by Swediaur (1798/1809) in French. Interestingly in Reiter's cases, from 1916, the arthritis followed dysentery [4] and even in 1948 Peronen [5] believed only dysenteric infection preceded Reiter's syndrome. The possibility of Reiter's syndrome after dysenteric infection with an aseptic urethritis is widely accepted [6].

The main advances in the nineteenth century especially involved London teaching hospitals and we have therefore, reviewed the medical literature on sexually acquired arthritis and examined the medical records of London teaching hospitals from this period.

Methods

We surveyed the medical literature before 1900 and reviewed cases from the archives of three teaching

hospitals to derive a picture of arthritis in association with venereal disease in nineteenth century London. As far as possible we have excluded arthritis associated with syphilis.

Reviews of Literature

The original sources of rheumatological literature were the libraries at the Royal Society of Medicine, the Royal College of Physicians (especially the Heberden library) and several London medical schools. We were helped by advice from the Wellcome Institute for the History of Medicine.

Clinical Case Ascertainment

We visited the archives at University College Hospital, St Bartholomew's Hospital and the Royal London Hospital and reviewed original case records for individual patients and examined diagnostic registers. We surveyed the case records for the first complete 6-year periods available at each hospital. Our reports are based on an interpretation of these records in the light of current diagnostic categories. Nineteenth century hospital records are variable in their quality and availability. Although the hospitals chosen were not the only ones in London at that time, they were the only teaching hospitals where we were able to review accessible records spread over 6 consecutive years.

Results

Literature Before 1800

Sydenham [7] described pains in the limbs following gonorrhoea but did not observe joint involvement. Musgrave [2] and Astec [3] described both joint and eye involvement after venereal disease, but did not observe the syndrome of urethritis and conjunctivitis. Several medical authorities such as Cheyne (1722) [8], James (1745) [9], Pierce (1697) [10] and Cullen (1797) [11] described chronic arthritis, but none mentioned gonorrhoea or genitourinary disorders as possible causes. John Hunter, in his case book [12], did not recognise the association, and in his treatise of 1788 [13] states that he had never seen 'venerea attack the joints'. However, by 1810 [14] his views had changed and he said he had known venereal disease to be 'the seat of rheumatism'. Finally, Heberden [15] considered that mercury treatment for venereal disease caused rheumatism.

Literature from 1800 to 1840

The first clear description of arthritis associated with venereal disease was given by Swediaur (1798/1809 in French in a later English translation in 1819 [16]). Swediaur said that:

> *'Sometimes after blennorhhagica there is swelling of the knee, sometimes both knees and calcaneum'.*

Table 1. Published case reports of Reiter's syndrome from 1818 to 1836

Source	Year	Number	Details
Brodie	1818	6	Five cases described in detail with urethritis, eye inflammation and arthritis. Sixth case mentioned briefly
Astley Cooper	1823	2	Detailed report of an American with gonococcal infections, inflammation of eyes and rheumatism of joints
St Thomas's Hospital	1823	1	Blacksmith with gonococcal infection who developed inflammation of both eyes and widespread arthritis
Lawrence	1825	3	Mainly eye involvement associated with urethritis and arthritis.
Thomson	1836	1	Recurrent urethritis and arthritis with some eye inflammation

The most widely recognised [17] early report is Brodie's description of six cases in 1818 [18]. These included the triad of urethritis, arthritis and conjunctivitis. The first patient is illustrative:

> *'A man aged 45 had gonorrhoea in June 1817 followed by pain in the feet and purulent inflammation of the eyes. His left knee swelled and later his right knee, elbow and shoulder were affected. By August 1817 there was a gradual improvement'.*

His other five cases are broadly similar, though not all are reported in so much detail. In the ensuing two decades further cases were reported, by Astley Cooper [19], from St Thomas's Hospital [20], by Lawrence [21] and by Thomson [22], making 13 cases between 1818 and 1836 (Table 1). In 1836 Thomson commented that the character of the disease is well known and should not be confused with direct gonococcal infection.

Literature After 1840

Many reviews provide a complete description of the triad of arthritis, urethritis and conjunctivitis. In 1866 Tixier [23] described 14 cases. He regarded eye involvement as rare. In 1872 Bond [24] reported a series of patients from one specialist unit (the Lock Hospital) and quoted a frequency of 10% in 300 patients with venereal disease. He noted the condition was rare in women, though he gave two examples: one a prostitute and the other a married women with constitutional symptoms, pain in the heels, effusions into the knees, inflamed sclera and urethral discharge. Potter [25] in 1878 reviewed 20 cases

from St Thomas's Hospital including one woman. He noted involvement of the tendo-achilles, sole of the foot and the back.

Medical textbooks described the syndrome. Johnson [26] in *Holmes' Surgery* from 1862 regarded the disease as usually mild and not necessarily associated with gonorrhoea. Broadhurst [27] in *Reynold's System of Medicine* from 1866 described four patients left with ankylosis of the fingers, hips, knees, ankles and spine. Bumstead [28] in *Pathology and Treatment of Venereal Diseases* from 1870 reviewed 81 cases: 64 had knee, 30 had ankle and 15 had toe and finger involvement.

Relationship to Gonorrhoeal Infection

This was a source of confusion and debate. Some cases of arthritis were clearly due to direct gonorrhoeal infection, even though the organism was only recognised in the latter half of the nineteenth century. In 1846 Kinnier [29] suggested in four cases that trauma could have caused arthritis to complicate gonorrhoeal infection. After the discovery of the gonococcus by Neisser in 1859 [30], Studenski [31] demonstrated the organism in a joint. In 1889 Rugg [32] described a patient who developed hyperpyrexia following joint involvement, suggesting the existence of gonococcal septicaemia. On the other hand, as early as 1842 Macleod [33] had commented on the absence of it in some cases. The debate continued for many years with Charcot [34], in 1881, doubting whether gonococcal rheumatism existed; however, by 1895 [35], recurrent attacks of gonococcal rheumatism leading to permanent deformities and ankylosing had been recognised.

Cases at London Teaching Hospitals

We reviewed the case records from 1834 to 1839 at University College Hospital and St Bartholomew's Hospitals and identified five cases of arthritis associated with venereal disease out of 158 admissions for rheumatic disorders (Table 2). We reached a diagnostic conclusion after one of us (G.S.) read complete details available in the medical records. The clinical pictures of three individual cases are summarised in Table 3.

We subsequently reviewed the diagnostic register at the Royal London Hospital, which records admissions by name and commenced in 1895. We examined the records for 1895–1900. Arthritis was divided into rheumatism, rheumatoid arthritis and gonorrhoeal rheumatism. As far as we can tell, a dresser or clerk filled in the book at intervals and retrospectively. The term gonorrhoeal rheumatism was usually used and we have accepted the nineteenth century physicians' diagnosis. During this 6-year period there were 59 male cases and 12 female cases with gonorrhoeal rheumatism (Table 4). The brief descriptions suggest the likelihood of Reiter's syndrome in many of these. The frequency of sexually acquired arthritis was 5/158 (3%) admissions at University College and St Bartholomew's Hospitals and 71/2143 (3%) of admissions at the Royal London Hospital.

Table 2. Cases of Reiter's syndrome from 1834 to 1839 at University College and St Bartholomew's Hospital

Hospital	Years	Cases of arthritis	Possible Reiter's syndrome
University College Hospital	1834–39	88	4
St Bartholomew's Hospital	1834–40	70	1

Table 3. Details of three cases from the 1830s

Hospital	Patient	Case history
University College Hospital July 1836	A servant aged 30 years	Admitted with a fourth attack of gonorrhoeal rheumatism. The first attack, 9 years previously, had affected his left foot and other joints. The second attack had been 6 months later. The third attack, 4 years previously had lasted 9 months. Each attack followed a gonorrhoeal discharge and occurred as the discharge was abating. During the second and third attacks he had inflammation of the eyes. The fourth attack also followed gonorrhoeal discharge. One week later he developed pain in the left hip and knee which was swollen and tender. Opthalmic inflammation occurred a little before the rheumatism. His right knee was later affected and he had back pain. With treatment there was steady improvement
University College Hospital March 1836	A navigator aged 36 years	He had suffered from gonorrhoeal infection for 2 months previously. Ten days prior to admission he had a fleeting pain in his shoulders and elbow. A few days later his knee and sterno-clavicular joints swelled. The swelling of the knee recurred but over the next 2 weeks he became better and was said to be cured
St Bartholomew's Hospital August 1838	A goldsmith aged 28 years	He had swelling of the right foot, particularly the fourth metatarsal joint, pain in both ankles and conjunctivitis of both eyes. There was a history of gonococcal infection 2 weeks previously and the onset of arthritis 1 week later. He had had several attacks since 1832; his eyes were always affected and gonorrhoea was always followed by arthritis. The present attack was prolonged with hands and knees later becoming involved. He was discharged in December though his joints were still stiff

Table 4. Cases of arthritis admitted to the London Hospital from 1895 to 1900

Year	Arthritic cases		Rheumatoid arthritis		Gonorrhoeal rheumatism	
	Male	Female	Male	Female	Male	Female
1895	182	136	6	6	10	1
1896	223	180	10	14	2	1
1897	224	121	10	11	7	2
1898	213	179	11	12	10	3
1899	247	174	5	6	17	2
1900	237	17	11	11	13	3
Total	1326	807	53	60	59	12

Discussion

Arthritis associated with venereal disease became relatively common in London from 1820 onwards, with 13 cases described in the literature between 1818 and 1836. The triad of arthritis, urethritis and conjunctivitis was often 'gonorrhoeal rheumatism'. This sexually acquired arthritis accounted for 3% of admissions at University College and St Bartholomew's Hospitals between 1835 and 1839 and also 3% of admissions at the London Hospital from 1895 to 1900. This seems more common than in our current clinical practice and may reflect a change in their prevalence. Recent reports from Holland [36] and Greece [37], which suggest large recent declines in the frequency of Reiter's syndrome, illustrate the temporal changes in its frequency.

The onset of arthritis associated with venereal disease in the early nineteenth century may have resulted from social and industrial changes after the Napoleonic wars and the Industrial Revolution. In keeping with this concept, Reiter's syndrome has been related to times of war. It has been linked with the American Revolutionary War by McSherry [38] and the medical history of military campaigns contains several examples of Reiter's disease. Hodgetts [39] suggested epidemic (dysenteric) and sporadic (venereal) forms of Reiter's syndrome are historically prevalent in soldiers due to a combination of the squalor of the war and the unrestrained behaviour of the private soldier. There has been considerable interest in the first case of Reiter's disease. Anderson [40] suggested that the Renaissance artist Benvenuto Cellini, who admitted in his autobiography to contracting a sexually transmitted disease, may have had Reiter's disease. There has also been speculation that Columbus may have had Reiter's syndrome [41–43].

We now understand many of the pathological events underlying Reiter's syndrome and reactive arthritis, including its infective origin. Hughes and Keat [44] have outlined the range of microorganisms involved, including *Chlamydia trachomatis*, *Salmonella enteritis* and *Shigella flexneri*. It can occur in epidemic form and Noer [45] described an epidemic of post-dysenteric Reiter's syndrome. We have no knowledge of the organisms involved in nineteenth century London. Some cases were undoubtedly due to gonococcal infection but it is likely that many other organisms were involved.

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