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Rubella Arthritis

A Study of Twenty Cases

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• **Twenty patients, five males and fifteen females, who had rubella arthritis were observed for periods ranging from one to ten years after recovery.**

Rubella arthritis in these patients was characterized by polyarthritis associated with fibrositis, myalgia, paresthesias and muscular weakness. All of the male patients but only one-third of the females had involvement of the knee joints. The small joints of the hands were the joints most commonly affected in women. Post-rubella arthritis rheumatic symptoms, especially fibrositis, persisted for many months in almost half of the females, not at all in the males.

The leukocyte content of the blood tended to be low and the erythrocyte sedimentation rate accelerated in the few patients in which determinations were done.

Latex tests were performed in 17 patients. Ten of the 17 were studied with the three-stage technique of Hall. Results of inhibition tests were positive in 80 per cent of the patients with rubella arthritis studied who were tested within 18 months after the onset of illness. None of the patients tested 18 months or more after rubella arthritis had positive reaction.

ALTHOUGH ARTHRITIS is one of the most common complications of rubella it has attracted little attention in the American medical literature.[4,8] Our interest in this disease was stimulated by the recent report of Johnson and Hall[8] and by the observation of 20 patients with rubella arthritis at the Palo Alto Medical Clinic during the last ten years.

The clinical manifestations of rubella arthritis are variable in character, severity and duration, but certain features are commonly observed.[1,2,4,6-17] Rubella arthritis has rarely been observed in children before puberty and it affects women far more frequently than men. The symptoms in the joints usually appear with or after the onset of the rash, they may persist for two to fourteen days and they do not produce permanent joint deformity. The joints most frequently affected are: Small joints of the hands, the wrists, knees, ankles and toes. Rarely are the hips and shoulders involved. Pain is a prominent feature and may be associated with fibrositis and joint tenderness with only slight joint swelling. Migratory polyarthritis has been observed, but more commonly the symptoms persist in the joints initially involved. The symptoms that may be noted in addition to arthritis include weakness, paresthesias, lumbago, sciatic nerve pain and fibrositis.

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Fever is not usually associated with rubella arthritis but a secondary rise in temperature may occur coincident with the onset of arthritis.

The treatment of patients with rubella arthritis has generally been restricted to rest, local heat and salicylates. Usually the symptoms subside promptly

and it is difficult to evaluate the results of therapy in most patients.

The only complications that appear to be directly related to rubella arthritis are monarticular arthritis, myalgia, fibrositis and arthralgia.[9,13] These symptoms may persist or recur intermittently after rubella arthritis.

Results of routine laboratory tests in patients with rubella arthritis have seldom been noted in the published reports. In uncomplicated rubella, leukopenia occurs early and the cell count then promptly returns to normal. The erythrocyte sedimentation rate stays within a normal range in uncomplicated rubella.[17]

Latex tests were performed on ten patients with rubella arthritis and seven patients with uncomplicated rubella by Johnson and Hall.[8] Two of those with uncomplicated rubella and nine with rubella arthritis had positive results when euglobulin-inhibition reactions were studied.

RESULTS

Many of the classical features of the disease were noted in the 20 patients with rubella arthritis that we observed (Table 1). In all the male patients the knee joints were affected, while this occurred in only one-third of the female patients. The joints most commonly affected in the females were the small joints of the hands and the wrists. The clinical diagnosis of rubella arthritis was made only in patients who had objective joint swelling in addition to the complaints of joint pain and stiffness. Patients who had only arthralgia with rubella were not included in the study.

Common symptoms associated with rubella arthritis in this group of patients were fibrositis, myalgia, paresthesias and weakness (Table 2). Only one patient was specifically noted to have a secondary rise in temperature.[8]

Seven of the female, but none of the male, patients had residual rheumatic symptoms after recovery. Two of these patients had preexisting arthritis, but the others had no evidence of arthritis. The commonest residual symptom was fibrositis (four patients), while one woman had persistent arthralgia, one had monarticular arthritis in a previously asymptomatic osteoarthritic finger joint and a third had a flare-up of previously quiescent (five years) rheumatoid spondylitis (Table 2).

Although rheumatic fever is known to occur in association with streptococcal infection complicating rubella[1] we found no clinical or laboratory evidence of streptococcal infection in our patients. Follow-up observations were made on all the patients for a minimum of one year and no clinical evidence of the usual sequellae of rheumatic fever was noted.

TABLE 1.—*Clinical Features in 20 Patients with Rubella Arthritis*

1. Sex: Female—15 Male—5	
2. Age: 14 to 47 years	
3. Joints affected:	No. of Cases
Small joints of the hands	17
Knees	10
Wrists	7
Feet	5
Ankles	4
Elbows	3
Shoulders	2
4. Onset of arthritis after rash: 0 to 3 days.	
5. Duration of joint symptoms: 2 to 14 days	

TABLE 2.—*Associated Symptoms and Complications in 20 Patients with Rubella Arthritis*

1. Associated symptoms:	No. of Cases
Fibrositis	8
Myalgia	3
Paresthesias	3
Muscular weakness	1
Fever	1
2. Complications:	
Persistent fibrositis	4
Persistent arthralgia	1
Flare-up osteoarthritic joint	1
Flare-up rheumatoid spondylitis	1

Therapy in 17 patients was limited to rest, local heat and salicylates. Result varied from no effect to moderate relief of joint symptoms. One patient received prednisolone for ten days and the patient with the persistent monarticular arthritis received a local injection of hydrocortisone. The systemic steroids and phenylbutazone produced excellent symptomatic relief while the local injection was of only transient benefit.

Routine laboratory tests were performed infrequently during the acute illness. In four patients the number of leukocytes per cu. mm., determined at the time of joint symptoms, were 6,350, 5,400, 4,700 and 4,000. The erythrocyte sedimentation rates (Wintrobe) in three patients with uncomplicated rubella arthritis were 40, 26 and 23 mm. in one hour. These accelerated rates all returned to normal limits after recovery. In the patient with rheumatoid spondylitis the erythrocyte sedimentation rate was 51 mm. in one hour at the time of the rubella arthritis, and six months later it was 23 mm. in one hour. In addition to routine laboratory tests we occasionally obtained throat cultures, antistreptolysin titers, preparations for lupus erythematosus cells, and serum protein electrophoresis. These were normal or negative in all patients tested.

Latex tests were performed in 17 patients.* Ten of the 17 were studied with the three-stage technique of Hall,[5] in which the patient's serum, the euglobulin fraction and the euglobulin-inhibition test are

*Latex tests were performed in our own laboratory and through the courtesy of Dr. Arthur Hall, Robert Breck Brigham Hospital, Boston.

TABLE 3.—*Results of Latex Tests in Rubella Arthritis*

Patient	Age	Sex	Date of Rubella	Date of Test	Serum	Euglobulin	Inhibition
1	35	F	Dec. 27, 1958	Oct. 30, 1959	0	0	+
2	46	F	June 1, 1958	Oct. 30, 1959	0	0	+
3	42	F	May 15, 1958	Oct. 30, 1959	0	0	+
4	28	F	May 7, 1958	Oct. 30, 1959	0	0	+
5*	42	F	June 23, 1958	Oct. 30, 1959	0	0	0
6	46	F	April 21, 1958	Oct. 30, 1959	0	0	0
7	18	M	April 8, 1958	Oct. 30, 1959	0	0	0
8	38	M	March 1, 1958	Oct. 30, 1959	0	0	0
9	47	F	June 10, 1957	Oct. 30, 1959	0	0	0
10	24	F	Feb. 20, 1955	Oct. 30, 1959	0	0	0
11	41	M	March 15, 1949	Oct. 30, 1959	0	0	0

* Rheumatoid spondylitis.

used. Blood specimens obtained from these patients from ten months to ten years after they recovered from rubella arthritis were studied in Hall's laboratory (Table 3). Results of tests using the patient's serum and euglobulin fraction were negative in all patients studied in Hall's laboratory. Result of euglobulin-inhibition tests were positive in four of the ten patients studied. These patients were all females and all had had rubella arthritis less than 18 months before the testing. In all the patients, including the three males, who were tested 18 months or more after the occurrence of rubella arthritis, the results of euglobulin-inhibition tests were negative. One patient with rheumatoid spondylitis and rubella arthritis had a negative euglobulin-inhibition test when studied 16 months after she had had rubella arthritis. All of the 17 patients studied in our own laboratory had negative results of latex tests using the patient's serum. Sensitized sheep cell agglutination tests (using F-11 coated tanned sheep cells) for rheumatoid factor were performed on the sera of ten patients† from three weeks to four years after the occurrence of rubella arthritis and only one of the patients (Case 3, Table 3) had a positive result: Three weeks after rubella arthritis, F-11 agglutination titer was 1:896, three months later it was 1:224 and seventeen and a half months later it was negative. This patient was one of the four in whom the result of the euglobulin-inhibition test was positive.

DISCUSSION

Based on our own observations, and those previously reported, rubella arthritis can be characterized as a self-limited polyarthritis affecting young adults, particularly females, and usually persisting for from two to fourteen days. We have found leukopenia and an elevated erythrocyte sedimentation rate in the few patients studied. The clinical picture in males and females appears to differ in that all the male patients we have observed have had involvement of the knee joint while this is uncommon in females. The latter usually have involvement of the small joints of the hands, an infrequent occurrence in males.

Recurrent or persistent rheumatic complaints, particularly fibrositis, myalgia and arthralgia, occurred in almost one-half of our female patients and in none of the male patients. These symptoms have been noted by others,[9,13] but this striking sex difference was not previously commented upon.

Recently, Johnson and Hall[8] reported the results of a study of ten patients with rubella arthritis and seven with uncomplicated rubella by means of latex tests. In patients with rubella arthritis they found no positive results using serum alone, but positive results in two cases by using the euglobulin fraction of the patient's serum and positive results in nine cases by use of the euglobulin-inhibition technique described by Hall.[5] In the patients with uncomplicated rubella results of tests using serum alone were negative, as were those in which the euglobulin fraction was used, but two of the seven had positive results by euglobulin-inhibition tests. These patients were studied after intervals of from three days to seven months after the onset of rubella. In our patients, tests using Hall's technique[5]* were performed after intervals of eleven months to ten years after the onset of rubella. In our group of patients 80 per cent of the females studied within 18 months of rubella arthritis had positive euglobulin-inhibition test results while none of the patients studied longer than 18 months after rubella had a positive result. These results suggest that a high percentage of patients with rubella arthritis will have positive euglobulin-inhibition tests initially and that these will tend to become negative with the passage of time. Johnson and Hall[8] suggested that this phen-

†The F-11 agglutination test, using sensitized sheep red blood cells coated with F-11 globulin, is one of the tests for the so-called rheumatoid factor. The tests were performed in the Laboratory of Dr. Wallace Epstein, University of California Medical Center, San Francisco.

*Tests performed through the courtesy of Arthur P. Hall, M.D., Robert B. Brigham Hospital, Boston.

omenon might represent a nonspecific alteration of serum protein to infection rather than the presence of actual rheumatoid factor in the serum of patients with rubella arthritis. Virus infections seem particularly likely to produce such alterations in serum proteins, Dresner and Trombly[3] finding that 29 of 35 patients with a variety of viral infections (none had rubella) had positive reaction to euglobulin-inhibition tests.[3] Johnson and Hall,[8] however, as previously noted, reported the results of inhibition tests positive in only two of seven patients with uncomplicated rubella but in nine of ten patients who had rubella arthritis. However, since the rubella patients with uncomplicated disease were all studied approximately four months after the onset, whereas the patients with rubella arthritis were studied at various intervals—as early as three days to as long as six months after the onset of illness—differences in lapse of time after the acute phase may have been a factor in the differences in results. It may be noted in this regard that Dresner and Trombly[3] found that the agglutinating factor or factors disappear when the pathogenetic mechanisms cease to operate, as by remission or cure of the causative disease. Whether or not the presence of arthritis can be related to the presence of agglutinating activity by the euglobulin-inhibition technique will await further study of patients with uncomplicated rubella as well as those with rubella arthritis.

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