ARTHRITIS AND VIRAL HEPATITIS

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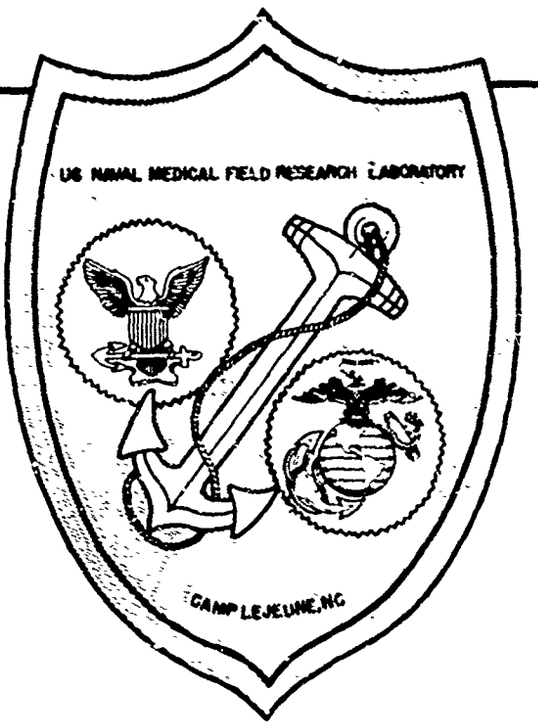
Camp Lejeune, North Carolina

4 October 1971



U.S. NAVAL MEDICAL FIELD
RESEARCH LABORATORY
CAMP LEJEUNE, NORTH CAROLINA

Vol. XXII, No. 28 December 1972

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Bureau of Medicine and Surgery, Navy Department
Work Unit MF51.524.009-8011BF61.13

5

Security Classification

DOCUMENT CONTROL DATA - R & D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
Naval Medical Field Research Laboratory Camp Lejeune, North Carolina 28542	Unclassified
	2b. GROUP

3. REPORT TITLE

ARTHRITIS AND VIRAL HEPATITIS

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

5. AUTHOR(S) (First name, middle initial, last name)

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6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO OF REFS
December 1972	5	10

8a. CONTRACT OR GRANT NO	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO. MF51.524	MF51.524.009-8011 BF6I.13
c. Task No. MF51.524.009	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d. Work Unit No. MF51.524.009-9-11 BF6I	Vol. XXII, No. 28

10. DISTRIBUTION STATEMENT

Approved for public release; distribution unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	Bureau of Medicine and Surgery Department of the Navy Washington, D. C. 20390

13. ABSTRACT

The relationship of arthritis and viral hepatitis has recently been emphasized. It is suggested that circulating antigen-antibody complexes incorporating complement are responsible for arthritic symptoms in many cases. Although testing for the presence of hepatitis-associated antigen (HAA) is now employed more frequently to distinguish long incubation viral disease, no inferences can be drawn as to whether arthritis is more common in one form of hepatitis or the other.

We present a case of arthritis associated with transient HAA and low serum complement in acute viral hepatitis. George L. Le Bouvier, MD, of Yale University performed the test for hepatitis-associated antigen using the semiquantitative immunodiffusion method. (U)

Unclassified

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Arthritis						
Hepatitis						
HAA						
Viral Hepatitis						

II

DD FORM 1 NOV 65 1473 (BACK)

S/N 0102-014-6600

Unclassified

Security Classification

Reprinted from the Archives of Internal Medicine
November 1972, Volume 130

Arthritis and Viral Hepatitis

A Patient With Transient Serum Hepatitis-Associated Antigen, Skin Nodules, Rash, and Low Serum Complement

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The relationship of arthritis and viral hepatitis has recently been emphasized.[1,2] It is suggested that circulating antigen-antibody complexes incorporating complement are responsible for arthritic symptoms in many cases.[1,3] Although testing for the presence of hepatitis-associated antigen (HAA)[4,5] is now employed more frequently to distinguish long incubation viral disease, no inferences can be drawn as to whether arthritis is more common in one form of hepatitis or the other.

We present a case of arthritis associated with transient HAA and low serum complement in acute viral hepatitis. George L. Le Bouvier, MD, of Yale University performed the test for hepatitis-associated antigen using the semiquantitative immunodiffusion method.[6]

Patient Summary

An 18-year-old white serviceman was referred from the brig with a seven-day history of anorexia, nausea, vomiting, and crampy right upper quadrant pain. Over the same period he developed arthralgias and an erythematous pruritic rash over the volar aspect of both wrists. Five days before admission his urine darkened and he described a distaste for cigarettes. He denied parenteral drug abuse and gave no history of raw shellfish ingestion, recent tattoo, blood transfusion, or foreign travel. One day before admission he noticed stiffness and swelling of the third finger of his right hand.

Received for publication May 14, 1971; accepted Oct 4.

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The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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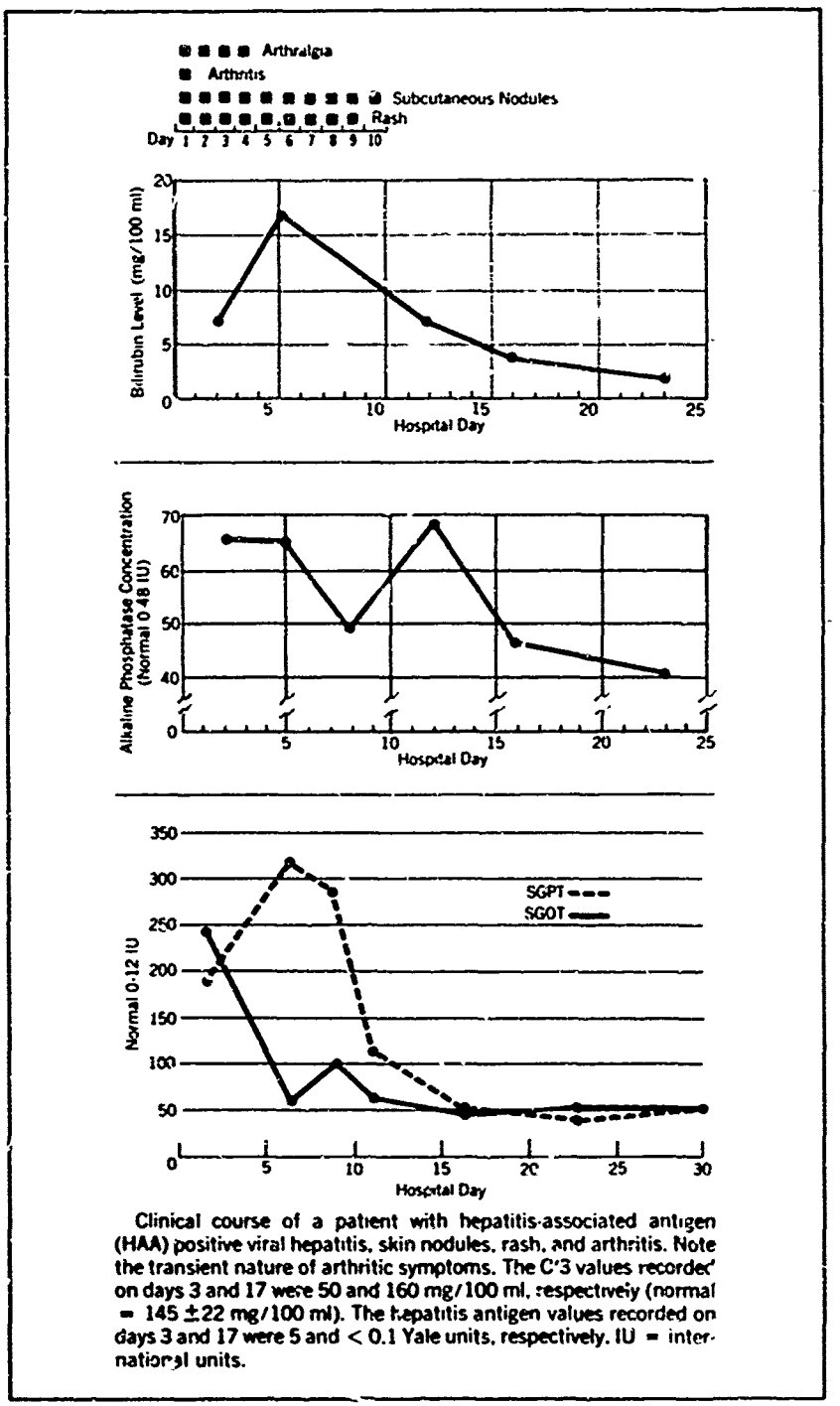

Clinical course of a patient with hepatitis-associated antigen (HAA) positive viral hepatitis, skin nodules, rash, and arthritis. Note the transient nature of arthritic symptoms. The C'3 values recorded on days 3 and 17 were 50 and 160 mg/100 ml, respectively (normal = 145 ± 22 mg/100 ml). The hepatitis antigen values recorded on days 3 and 17 were 5 and < 0.1 Yale units, respectively. IU = international units.

On admission he was obviously jaundiced and in no distress. His blood pressure was 130/80 mm Hg; pulse rate, 100 beats per minute; and temperature, 37.2 C (99 F) orally. His liver was palpable, tender, and had a span of 11 cm by percussion. The spleen tip was palpable. On examination of the extremities, a mild swelling of the proximal interphalangeal joint of the right third finger was noted.

Circinate and annular erythematous plaques were present over the wrists, knees, and dorsum of the feet. In addition, there were six to seven erythematous, blanching, nontender 1-cm nodules on the flexor and extensor aspects of both forearms. A fine erythematous maculopapular eruption covered the flexor aspect of the forearms. Initial hemoglobin level was 16.4 mg/100 ml with a hematocrit value of 49%. White blood cells numbered 5,200/cu mm with 45 neutrophils, 53 lymphocytes, and 2 eosinophils. Sedimentation rate was 4 mm/hr. Results of the following laboratory studies were normal: heterophil agglutinin, two lupus preparations, latex fixation, and serologic test for syphilis.

His initial serum complement C'3 test (Hyland radial immunodiffusion plate) revealed a 50 mg/100 ml value, which was associated with 5 Yale units of HAA subgroup Y. Two weeks later when HAA could not be detected, serum complement had risen to 160 mg/100 ml.

His hospital course (Figure) was afebrile after the second day, when he had a temperature orally of 37.8 C (100 F). The objective evidence of arthritis disappeared by the second day and the arthralgia by the fourth day of hospitalization.

A skin biopsy of one of the nodular areas was performed on day 3 and showed an intact epidermis of normal thickness. The upper dermal capillaries showed a perivascular cuffing of lymphocytes and plasma cells. No diapedesis of red blood cells was noted.

The patient was treated symptomatically and no antiinflammatory agents were administered. He was discharged after 81 days, one week after his serum transaminase values returned to normal levels.

Comment

The association of rheumatic symptoms and viral hepatitis is variously stated from 3% to 18% of series studied.[1] As reported here, the rash and arthritis are usually seen together in the prodromal stages of illness involving distal joints. That the arthritic signs may be short-lived is illustrated in the patient summary. We emphasize the unilateral nature of the arthritis in our case in contrast to those cases of Fernandez and McCarty.[1]

Sutnick and others[7] have proposed that a genetic basis exists for the *persistence* of HAA. Furthermore, persistence of HAA has been associated with such illnesses as polyarteritis,[3] chronic hepatitis,[8] and hepatomas.[9] In contrast, our patient had a transient serum HAA value and recovered without sequelae.

The rash, erythematous nodules, and arthritis suggest a hypersensitivity state. The associated low level of serum complement suggests circulating antigen-antibody complexes in the acute period as a cause of symptoms. If the HAA particles are produced in the liver and bind with HAA antibody, it is likely that they are later cleared by the reticuloendothelial system. For uncertain reasons, large numbers of complexes may not be cleared and may occasionally pass into the systemic circulation. As a result they may lodge in peripheral capillaries, such as in skin and synovium, and cause systemic and localized symptoms. Gocke and others[3] have demonstrated circulating immune complexes composed of HAA and immunoglobulin in sera of HAA-positive patients with biopsy proved polyarteritis nodosa. Immunofluorescent studies demonstrated deposition of IgM, HAA, and complement in blood vessel walls of one patient. Similar studies in patients with transient illness, as in our case, still need to be performed. Of considerable interest with respect to a possible strain specificity of virus-causing arthritis is that our patient had immunoprecipitins to subgroup Y of HAA.[10] However, genetic host factors may modify the immune response to various viral subgroups.

Summary

An 18-year-old serviceman developed viral hepatitis with unilateral arthritis, skin nodules, and a maculopapular rash. His acute symptoms were associated with a low serum complement level and transient presence of hepatitis-associated antigen subgroup Y. We propose that circulating immune complexes which are deposited in synovial and skin capillaries may be responsible for his rheumatic and dermatologic symptoms, respectively.

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Printed and Published in the United States of America