DISCUSSION

The pathogenesis of nephrocalcinosis in our patient has not been defined. Known causes of nephrocalcinosis, such as hypercalemic and/or hypercalciuric states, distal renal tubular acidosis, oxalosis, medullary sponge kidney, and chronic pyelonephritis have been eliminated. In alkaptonuria, renal ochronosis and prostatic calculi have not been associated with nephrocalcinosis.[2, 3] It seems possible that the nephrocalcinosis may be related to the metabolic disorder of alkaptonuria. On the other hand, the nephrocalcinosis could be the result of another undetected genetic defect secondary to consanguinity.

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Meningococcal osteomyelitis: A report of two cases associated with septic arthritis

To the Editor:

Although *Neisseria meningitidis* is not an unusual pathogen in the child with septic arthritis, this organism has not been associated with osteomyelitis. Two infants are described with acute arthritis and osteomyelitis and isolation of *N. meningitidis* group B.

CASE REPORTS

Case 1. A two-month-old black male was admitted to Ben Taub General Hospital on January 12, 1971, with a history of decreased motion of the left arm which had begun two weeks previously. Examination revealed the left shoulder to be swollen and tender, but no warmth or erythema was noted. The rectal temperature was 100.4° F. Radiographs of the left humerus demonstrated a lytic lesion in the proximal humerus.

Initial laboratory data included a hematocrit of 30%, a white blood cell count of 18,000/mm^3 with 30% polymorphonuclear cells, and an erythrocyte sedimentation rate of 62 mm/hour. The cerebrospinal fluid contained no cells, and cultures were sterile.

Two days after admission the left shoulder joint was surgically explored; purulent fluid and a poorly calcified proximal humerus were observed. Sodium methicillin therapy was begun postoperatively at a daily dose of 150 mg/kg body weight divided in six intravenous doses. Cultures of joint fluid and bone obtained at surgery yielded *N. meningitidis* group B; four blood cultures were sterile. Aqueous penicillin G (300,000 units/kg body weight/day, administered in six intravenous doses) was substituted for methicillin. Intravenous therapy was continued for a total of two weeks and was followed by treatment for an additional two weeks with oral penicillin G. Follow-up examination and radiographic studies of the left humerus were normal several months after discharge from the hospital.

Case 2. A 20-month-old white male was admitted to Boston City Hospital on October 10, 1974, with a history of fever and evanescent rash for five days, and swelling and decreased movement of the left elbow for one day. The rectal temperature was 101.4° F. The left elbow was swollen, warm, and tender. No meningeal signs were present.

Laboratory data included a hematocrit of 32%, a white blood cell count of 8,900/mm^3 with 45% polymorphonuclear leukocytes, and an ESR of 66 mm/hour. The cerebrospinal fluid was normal and cultures were sterile. A radiograph of the left elbow showed soft tissue swelling and effusion. Arthrocentesis yielded purulent fluid containing 145,400 white blood cells/mm^3 (99% polymorphonuclear cells), 26 mg/dl of glucose, and no organisms were seen on Gram stain of the joint fluid. Culture of the joint fluid was sterile.

Intravenous therapy was initiated with sodium nafcillin and sodium ampicillin and was changed to aqueous penicillin G alone (100,000 unit/kg body weight/day in four intravenous doses) when *N. meningitidis* group B was isolated from the admission blood culture. Rapid clinical improvement ensued. A radiograph of the left elbow on the ninth day of hospitalization revealed periosteal elevation of the distal humerus with demineralization of bone. Penicillin G was administered for four weeks. The child recovered without any complications, and radiographs of the left elbow four months after discharge from the hospital were normal.

DISCUSSION

The majority of infections caused by *Neisseria meningitidis* localize in the meninges. Other sites, however, can be involved and are usually associated with meningitis. In Nelson's review[1] of 221 children with septic arthritis, 1.8% of cases were attributed to *N. meningitidis*.

Acute hematogenous osteomyelitis in children characteristically affects the metaphysis of long bones, as it did in both our patients. It seems possible that the first patient developed purulent arthritis as a complication of his osteomyelitis if one follows Trueta's hypothesis.[2] However, it is possible that the joint was the primary site of involvement, since extension may proceed in the opposite direction in a child of this age. Thus, it is difficult to ascertain the precise nature of the primary event—septic arthritis or osteomyelitis. That the first patient had osteomyelitis was documented by the isolation of the organism from the metaphysis.

The five-day history of rash and fever in the second child are suggestive of chronic meningococcemia. It is possible, though not

known, that the bacteremia resulted in simultaneous seeding of the organisms into joint and bone.[3] The finding of periosteal elevation has been described with septic arthritis caused by other organisms, but the association with meningococcal joint infections has apparently not been recorded previously.[4]

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T- and null cell proliferation in a patient with acute infectious lymphocytosis

To the Editor:

Acute infectious lymphocytosis, a benign viral disorder, may be associated with mild respiratory illness, diarrhea, exanthematous rash, or aseptic meningitis, and is invariably characterized by a marked increase in the number of circulating lymphocytes.[1] The nature of these lymphocytes is not yet known. A patient recently seen by us provided an opportunity to examine the subpopulation of these lymphocytes.

CASE REPORT

A 15-month-old boy was referred to us because of fever, conjunctivitis, macular rash, and lymphocytosis of $18.3 \times 10^3/mm^3$. At the time of admission, the physical examination was completely normal. The initial hemogram revealed a leukocyte count of $178 \times 10^3/mm^3$ with 96% small lymphocytes, 3% neutrophils, and 1% eosinophils. A bone marrow examination was within normal limits. Virus cultures of the stool, urine, and throat swab were all negative. Acute and convalescent sera showed no rise in antibody titers against following viral agents: influenza virus types A and B, para-influenza types 1, 2 and 3, adenovirus, respiratory synctial virus, mumps, herpes simplex, varicella-zoster, cytomegalovirus, rubella, poliovirus, and coxsackie viruses. Results of complement fixation tests for *Mycoplasma*, heterophil antibody titer, and Epstein-Barr virus antibody were all negative. The circulating lymphocyte count gradually returned to normal over the next two months.

The peripheral lymphocytes were isolated by Ficoll-Hypaque density gradient and studied using the technique of sheep erythrocyte (E) rosette formation for identification of thymus-derived T-cells and immunofluorescent staining of surface immunoglobulins for identification of bone marrow derived B-cells, as described previously.[2] The results (Table I) indicate that about half of the proliferating lymphocytes were T-cells and the other half of the proliferating cells were null cells without detectable markers for either T- or B-cells. The absolute number of B-cells showed unremarkable changes.

DISCUSSION

An increase in circulating T-cells during viral infection has been well documented in infectious mononucleosis. Since Epstein-Barr virus, the causative agent of infectious mononucleosis, has been found to infect only B-cells, it is postulated that the T-cells proliferate in an effective immune response to Epstein-Barr virus infection of the B-cells.[3]

Many viruses such as enteroviruses and adenoviruses have been implicated in acute infectious lymphocytosis. Because cell-mediated immune response is an important mode of host defense against virus infections, it appears likely that the T-cell proliferation in acute infectious lymphocytosis also reflects a successful host immune reaction toward the infectious virus agent. However, the T-cell increase in infectious mononucleosis and in acute infectious lymphocytosis may not be completely analogous, in view of differences in the morphology of the proliferating lymphocytes. In the former condition, the cells are large and atypical, whereas in the latter condition the cells are small lymphocytes, indistinguishable from normal small lymphocytes in stained blood smears.[1]

The marked increase in circulating null cells is difficult to interpret because of diverse findings regarding their origin. They may consist of immature B-cells,[4] immature T-cells,[5] and a third population of lymphocytes which executes antibody-dependent lymphocyte-mediated cytotoxicity.[6] Further study is needed to elucidate the nature of null cells in acute infectious lymphocytosis.

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