

Streptococcus. Pyogenes And Staphylococcus. Aureus Specific Mucosal And Systemic Immune Responses Of Patients With Arthritis

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Abstract:

Injured *St. pyogenes* and injured *S.aureus* were recovered from ten arthritis patients synovial fluids cultures by pretreatment with enriched media. The synovial fluid analysis indicated septic arthritis type. Mucosal and systemic and inflammatory cells were neutrophils. Systemic and mucosal globulin was higher than those of normal subjects.

Arthritis patients showed significant specific antibody titres and significant leucocyte inhibitory factors both at mucosal and systemic arms, but the systemic was of high antibody titres and more significant LIF, than mucosal. Thus. *S. pyogenes* and *St. aureus* stimulate humoral and cellular responses

Introduction:

The articular system in man consists of joints. Joints are of several types. They allow motion, bear weight and hold together. Among these joint types, the synovial joints (SJ) are those joints which are freely or completely movable. SJ has a number of parts as; Articular cartilage, articular disc, ligaments synovial, membrane, synovial fluid (SF) and the tendon. SF, however, is a lubricating fluid found where bones come together. The fluid is similar to egg white.⁽¹⁾

Synovial membrane, thus, is consisting of mucosal immune compartment vascularized loose CT with a variable amount of contained fat. It has a of the common immune system.⁽²⁾ This compartment contains highly surface layer of synovial cells with mucine droplets in their cytoplasm.⁽¹⁾

Normal and arthropathic joints contains leucocytes of both multinuclear and mononuclear types. While, during arthropathy the number of leucocyte, becomes marked increased. The humor contained glucose, protein and globulins. Arthropathy can be of infectious, autoimmune as well as non specific inflammatory conditions. Too high and Too low leucocyte glucose, and or protein contents of SF are constituting dependable criteria for arthropathy.⁽³⁾ Acute bacterial arthritis is the most dominant infectious condition among arthropathy cases (3&4). The objective of the present work was investigate:

- a. Potential bacterial pathogen.
- b. Separation of synovial globulins.
- c. Detection of differential leucocyte counts.
- d. Specific antibody at mucosal and systemic level
- e. Serum and mucosal autoantibody.
- f. Making LIF test for peripheral blood and mucosal leucocytes.
- g. Determine globulin concentration in synovial fluid & sera.

Materials and Methods:

Synovial Fluid samples were collected from ten patients. Blood with and without anticoagulant were collected from patients and ten control subjects⁽⁴⁾. The concentrations of synovial and serum globulins was made. Antibody titres in synovial globulins and sera were determined. Autoantibody RF was detected is in both SF and sera.⁽⁴⁾ Capillary leucocyte inhibitory factor for peripheral blood and mucosal leucocyte as in Soberg.⁽⁵⁾ Culture were done as in^(6,7) SF analysis was made following.⁽⁸⁾

Results:

- I- Synovial Fluid (SF) The noted SF was of septic type.
- II- Inflammatory cells; Neutrophilia was noted both in peripheral blood and in mucosal preparations as 72-73.6 and 66% respectively in acute arthritis patients. Lymphocytosis was lower than neutrophils at peripheral and mucosal levels.
- III- Bacteriology: Direct culture on blood agar, chocolate agar and MacConkey agar was negative. Pre-treatment with brain heart infusion then onto same media, they were positive giving two basic morphotypes. First as cocci, in chains nonmotile gram positive, pin head tiny beta-haemolytic on Blood Agar. Catalase and oxidase negative eschulin hydrolyzed, Bacitracin sensitive, optochin resistant group of lancefield. Hence It is *St. pyogenes*.

While the second morphotype was; cocci, in groups coagulase positive. Immotile, Beta haemolytic onto Blood Agar. Coagulase positive in free and bound forms. Mannitol, mannose and sucrose fermented. catalase positive, oxidase positive and tolerate 7% NaCl. Thus it is consistent with *S. aureus*.

Immunology:

1. *St. pyogenes*; Serum globulin concentration was 44.978, while mucosal globulin was 1.012 gm/ L as compared to 36 and 0.5 gm/L for systemic and mucosal. The systemic versus mucosal *S. pyogenes*.

Specific antibodies were 80- 640 and 8- 64 respectively. the systemic versus mucosal leucocyte inhibitory factors were 0.672 and 0.505 accordingly. Rheumatoid factor negative. (Table-1)

2. S.aureus serum and mucosal globulin concentrations were 42.62 and 0.813gm/L. The serum and mucosal antibody titris specific to St.aurus were 80-640 and 16-64 respectively. The systemic LIF was ranged 0.58-0.85 while it ranges from 0.6-0.78 for mucosal LIF. Rheumatoid factor was negative (Table-2).

Discussion:

The synovial fluid showed those cases were of septic arthritis type. The causative agents were injured St. pyogenes and S. aureus (5 &8). Both of there germs induced cellular and humoral immune response at systemic and mucosal compartments (specific, LIF). They were of non autoimmune by the fact of RF negative in serum and synovial fluid.⁽⁴⁾

The possible immunogenic epitope stimulating response in those patients may direct B activators, The T independent epitopes or Th2 inducing epitopes Td th inducing epitopes. Thus on summing up one may conclude:

- 1- Injured St. pyogenes and S. aureus are the agents of septic arthritis.
- 2- Inflammatory cells were. Neutrophlie type mostly
- 3- The specific adaptive immune responses were humoral systemic and mucosal.
- 4- This may be first report in this area.

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