Hematological Consequences of Anaplasmosis: Exploring Pancytopenia as a Clinical Outcome

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Introduction

● Anaplasmosis is a tick-borne illness caused by Anaplasma Phagocytophilum.
● The clinical features range from fever, headache, myalgias, nausea and vomiting.
● The other commonly encountered laboratory findings are neutropenia, thrombocytopenia and elevated transaminases.
● It rarely presents with pancytopenia such as our patient outlined below.
● A thorough history taking is important in the early identification and management of the tick-borne illness induced pancytopenia.

Case Presentation

● A 76 years old male presented with progressive generalized weakness, fever, rhinorrhea, dry cough and occasional lightheadedness requiring assistance in ambulation for the past 6 days.
● He denied any sick contact, tick bite or recent travel however lived in the countryside and worked outdoors.
● In ED, the patient was hemodynamically stable, febrile with temp 103F.
● Labs showed WBCs 3K, hemoglobin of 10, platelets 23k (baseline were normal). Anemia work up was normal and there was no suspected Hemolysis.
● Anaplasmosis phagocytophilum DNA PCR came positive.

● Peripheral blood smear showed morula consistent with anaplasmosis otherwise no abnormal cellular morphology.
● Patient was started on ceftriaxone and doxycycline.
● His blood count started improving with antibiotics and discharged home on Doxycycline 100mg and amoxicillin 500mg.

Discussion

● Human Granulocytic Anaplasmosis (HGA) is caused by Anaplasma Phagocytophilum which is a gram negative, obligate intracellular rickettsial organism.
● Its most common mode of transmission is ixodes tick bite (60.9%) followed by blood transfusion (8.2%).
● White tailed deer and white footed mouse are the most common reservoirs for anaplasma phagocytophilum. Northeast and the Upper Midwest regions in the USA have the most cases of HGA(1).
● Patients usually develop symptoms after five to fourteen days of tick bite which are nonspecific and often overlap with other tick-borne diseases (2).
● Pancytopenia as the initial presentation of anaplasmosis is very rare and there is no conclusive data available.
● The pathogenesis is largely unknown, but it is postulated that in infected cells, myelosuppressive chemokines like MCP-1, MIP-1 alpha and beta, and IL-8 are upregulated, hence decreasing the proliferation and differentiation of myeloid progenitor cells.
● Hospitalization is required in 36% cases with deaths occurring in less than 1% of the patients. Complications like multiorgan failure, rhabdomyolysis, acute kidney injury, non-traumatic splenic rupture are reported in a few cases (3)
● The most sensitive confirmatory laboratory test, used to confirm the diagnosis of HGA is serologic testing using an indirect fluorescent antibody method for anaplasma phagocytophilum IgG with demonstration of four-fold change or seroconversion.
● The recommended therapy for treatment of HGA is doxycycline which leads to clinical improvement in 24 to 48 hours.

Peripheral Blood Smear (Fig 1)

Cytoplasmic Neutrophilc Inclusions (Morulae) consistent with Anaplasmosis

References