Hematological Consequences of Anaplasmosis: Exploring Pancytopenia as a Clinical Outcome

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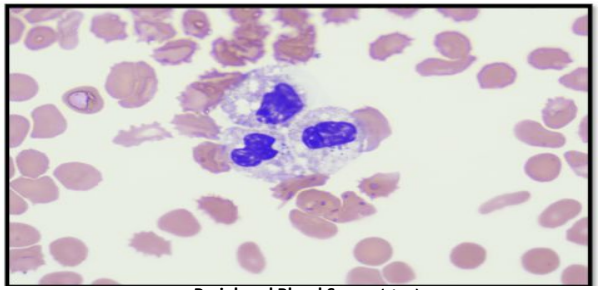
Introduction

- 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.



Peripheral Blood Smear (Fig 1)
Cytoplasmic Neutrophilc Inclusions (Morulae) consistent with Anaplasmosis

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.

References

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