

Autoimmune Hemolytic Anemia Presenting with Severe Anemia: A Case Report

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Abstract: -

Background: -

Autoimmune Hemolytic Anemia (AIHA) is a rare hematologic condition, where immune system produces antibodies that destroys red blood cells, leading to anemia and systemic complications. It may be idiopathic or secondary to autoimmune diseases, infections, certain medications or malignancies. Incidence rate is about 1 to 3 cases per 1,00,000 persons yearly.

Objective: -

- Early diagnosis.
- Rational treatment.

Case Summary: -

A 27 years old female patient presented with c/o fatigue, headache, breathlessness on exertion with pallor and icterus positive. Laboratory investigations showed that hemoglobin was 4.7 g/dl, elevated LDH (749 U/L), indirect hyperbilirubinemia (2.2 mg/dl) and a positive direct Coombs test. Peripheral smear revealed RBC clumping on smear spherocytes. No underlying cause was found. The patient was started with Tab prednisolone 10mg (BD) a Inj. Methylprednisolone and other supplements. Hemoglobin improved to 8.2g/dl over 1 week.

Method: - Prospective observational study.

Result: - Diagnosis confirmed as Autoimmune Hemolytic Anemia.

Conclusion: -

It is a potentially life threatening and treatable condition. Early diagnosis, rational treatment and a regular follow up can avoid relapse condition. Pharmacist plays an important role in monitoring therapy, detecting ADRs & providing patient education.

KEYWORDS: Autoimmune Hemolytic Anemia, Prednisolone.

I.INTRODUCTION

Autoimmune hemolytic anemia (AIHA) is the clinical condition in which IgG and/or IgM antibodies bind to RBC surface antigens and initiate RBC destruction via the complement system and the reticuloendothelial system.^[1] Autoimmune hemolytic anemia (AIHA) is increased destruction of red blood cells (RBCs) in the presence of anti-RBC autoantibodies with or without complement activation.^[2]

Classification of Autoimmune Hemolytic Anemia (AIHA)

I. Warm-reactive AIHA (Optimal reactivity of autoantibodies at 37 °C)

A. Primary (Idiopathic)

B. Secondary- Associated with lymphoproliferative disorders, Non-Hodgkin Lymphoma, Chronic lymphocytic leukemia (CLL), Associated with rheumatic disorders, Systemic lupus erythematosus (SLE), Associated with non-lymphoid malignancies (e.g., ovarian carcinoma), Associated with chronic inflammatory disorders (e.g., ulcerative colitis) and Drug-induced autoimmune hemolytic anemia

II. Cold-reactive AIHA

(Optimal reactivity of autoantibodies at < 37 °C)

A. Cold Agglutinin Syndrome (CAS)

- Primary (Idiopathic)

- Secondary- post-infectious (e.g., Mycoplasma pneumoniae, infectious mononucleosis Associated with B-cell lymphoproliferative disorders

B. Paroxysmal Cold Hemoglobinuria (Donath–Landsteiner syndrome)

III. Mixed-type AIHA (Presence of both warm and cold autoantibodies)

A. Primary (Idiopathic)

B. Secondary- Often associated with rheumatic disorders

IV. Drug-induced AIHA (Associated with ~150 drugs)

A. Drug-dependent AIHA

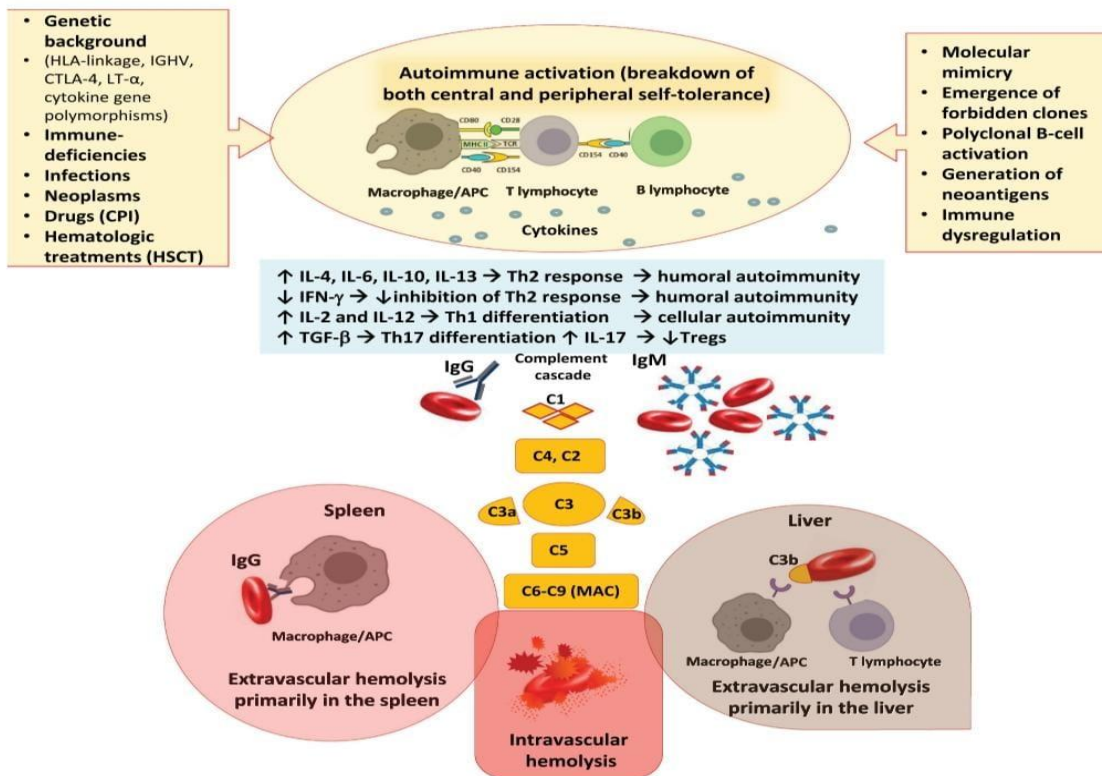
- Hapten (drug adsorption) type

- Immune (ternary) complex type
- B. Drug-independent AIHA^[3]

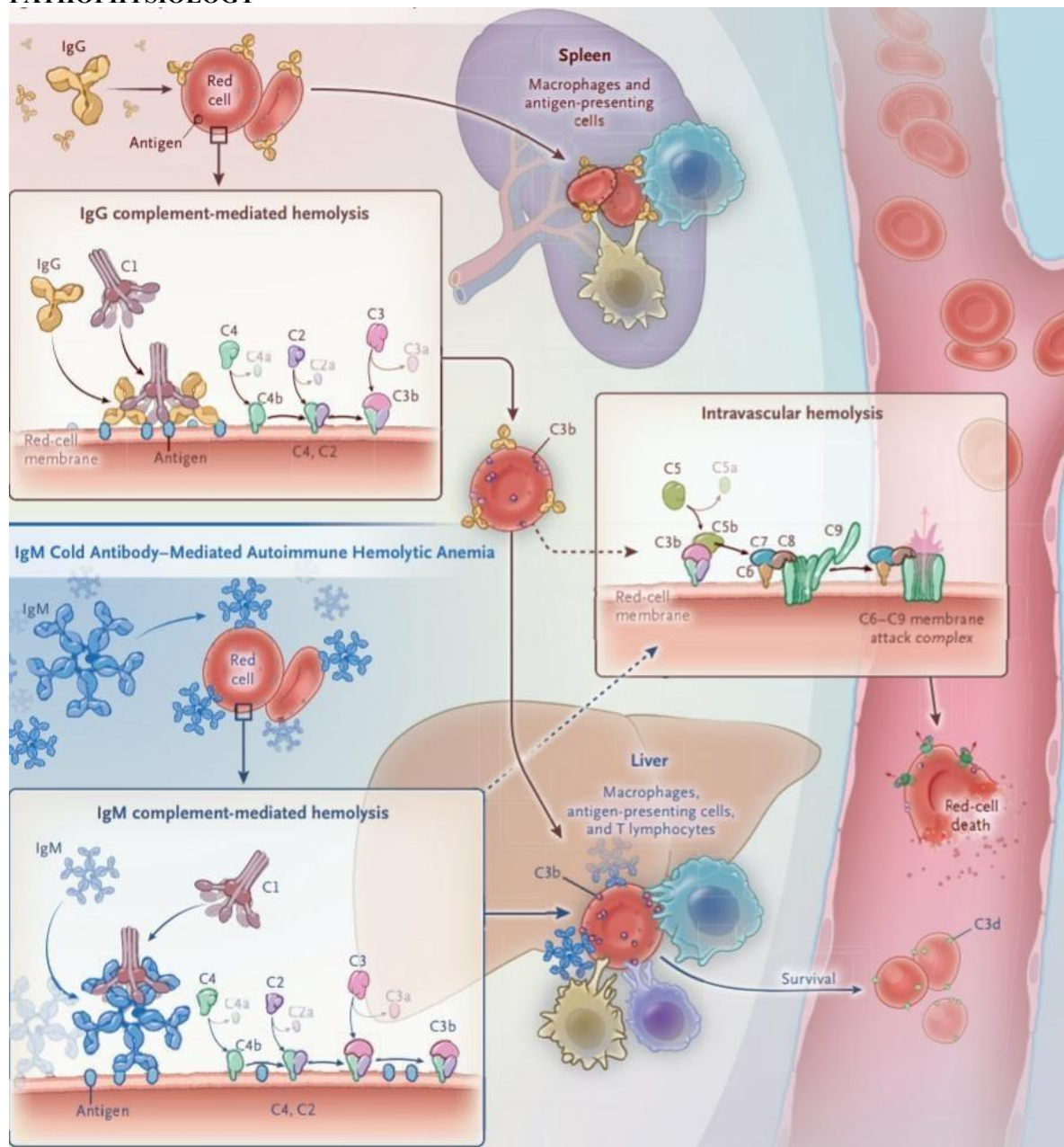
EPIDEMIOLOGY -

AIHA is now known as a disease in which autoantibodies are produced that target RBC antigens, resulting in the premature destruction with inadequate compensation. This group of diseases is relatively rare, affecting approximately 1–3 in 100,000 annually.^[3]

ETIOLOGY^[4]



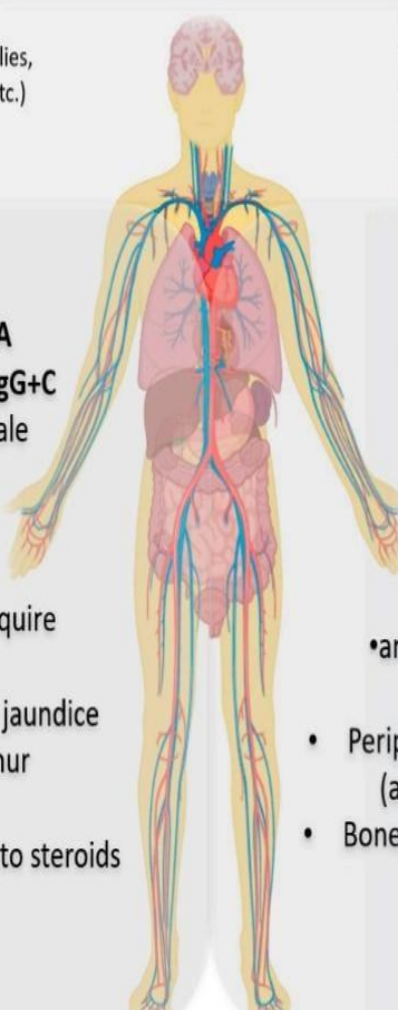
PATHOPHYSIOLOGY – [5]



CLINICAL MANIFESTATIONS ¹⁶¹ –

- Fatigue
- Jaundice
- Dyspnea
- Dark urine
- Others signs
(infections, organomegalies, skin rashes, arthralgia, etc.)

Common clinical findings and laboratory markers



- Hb – to ---
- Reticulocytes – to +++
- Schistocytes =
- LDH +/++
- Haptoglobin ---
- Bilirubin +
- Ferritin =/+
- Plt =/---
- WBC =
- Hemosiderinuria =/+

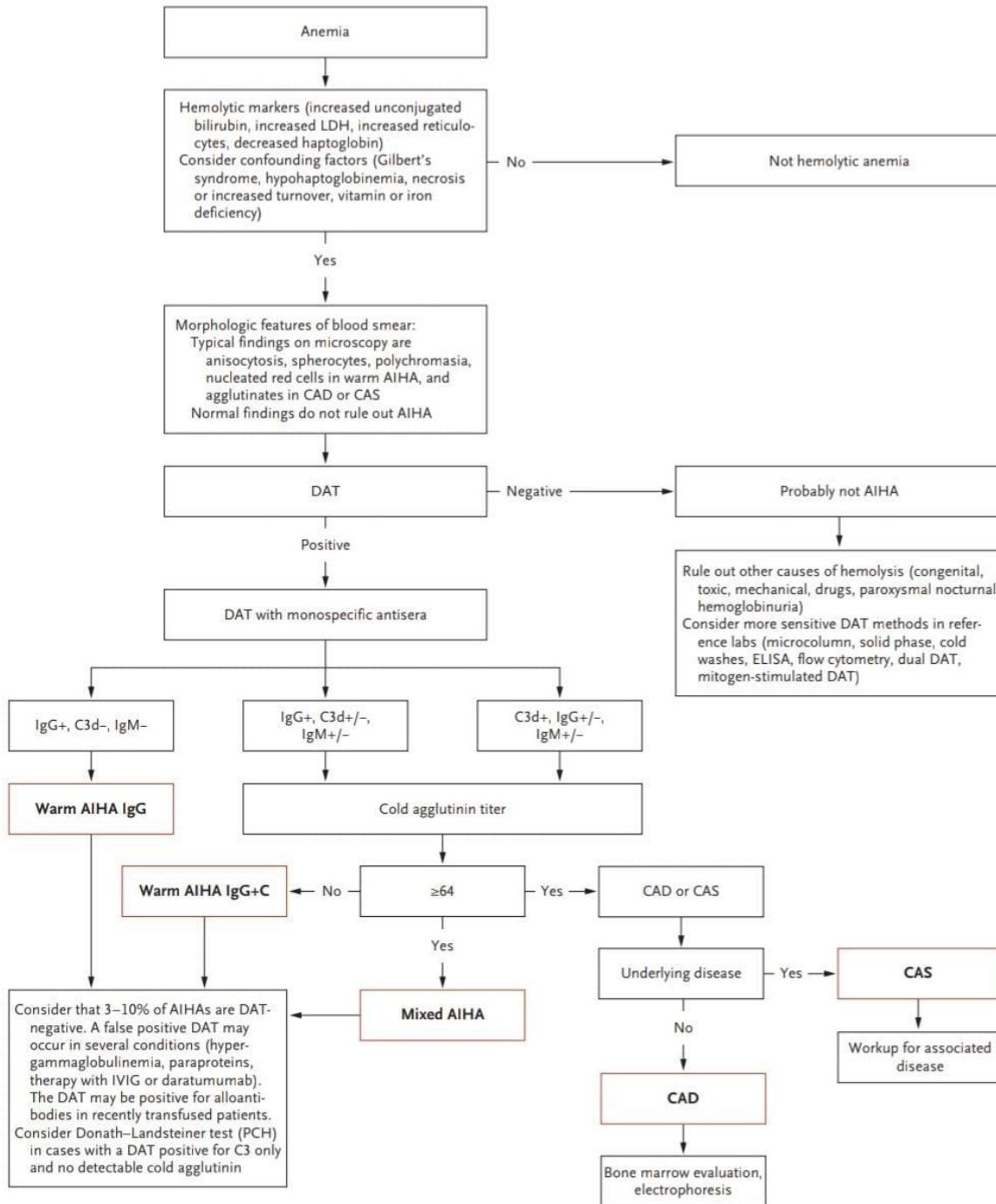
Warm AIHA
DAT+ for IgG/IgG+C

- Younger age and female predominance
- Acute presentation
- Severe anemia
- Almost all patients require treatment
- Deep asthenia, palor, jaundice
- Angina, systolic murmur
- LDH +/++
- More rapid response to steroids

Cold AIHA
DAT+ for C3d

- Older age
- Chronic presentation
 - LDH+++
 - Milder anemia
 - 20-30% Hb >10g/dL
- and never requires treatment
 - Hemoglobinuria
- Peripheral circulatory symptoms (acrocyanosis, Raynaud, rash)
- Bone marrow lymphoid infiltrate may be present

DIAGNOSIS [5]



TREATMENT [4] -

- Standard therapies for Warm autoimmune hemolytic anemia (wAIHA)
- ✓ 1st line- Steroids (Oral or IV Prednisone) or methylprednisolone 1 mg/Kg/ Day
- ✓ 2nd line- Rituximab IV 375 mg/m² or 100 mg/week x 4 weeks

- ✓ Further lines- Splenectomy, Azathioprine Oral 50–100 mg/day or Cyclophosphamide Oral 50 mg day 40–60 or Cyclosporin. An Oral 3–5 mg/Kg/day or Mycophenolate Mofetil Oral 1–1.5 g/day Danazol Oral 200–600 mg/day
- ✓ High dose – cyclophosphamide IV boluses 800 mg/m²
- ✓ Additional therapies- Intravenous immunoglobulin IV 0.4 g/Kg x 5 days or 1 g/Kg x 2 days or Recombinant erythropoietin Subcutaneous 40,000 IU/week
- Standard therapies for cold autoimmune hemolytic anemia(cAIHA)
- ✓ Watch and wait - - keeping patient and room warm and transfusion of pre-warmed to 37°C blood
- ✓ First line- Steroids Oral or IV prednisone or methylprednisolone 1 mg/Kg/day
- ✓ Rituximab IV 375 mg/m²/week x 4 weeks 50 Re-treatment equally effective; well-established safety profile
- ✓ Further lines- Rituximab/ fludarabine Oral 40 mg/m² days or Rituximab/ Bendamustine IV 90 mg/m² days 1–2 for 4 cycles of 28 days or Bortezomib IV or subcutaneous 1.3 mg/m² days 1,4, 8,11
- ✓ Additional therapies- Recombinant erythropoietin Subcutaneous 40,000 IU/week

II.CASE PRESENTATION

A 27 years old female patient was admitted to Ballari Medical College and Research Centre (BMC&RC), Ballari (Karnataka) with chief complaints of easy fatigability since 1 week and headache since 4 days which was gradually progressive in nature. There was no history of pain in abdomen or vomiting.

On day 4 the patient was advised to check for Direct Coombs Test were it was found to be positive.

SOCIAL HISTORY- No habits

PAST HISTORY- Nothing significant

FAMILY HISTORY – Nothing significant

ON EXAMINATION-

- BP- 130/80mmHg
- PR- 96bpm
- SPO₂- 97% decreased at RA
- RR- 16cpm
- Patient was conscious and oriented
- S1 S2 heard
- RS B/L NVBS positive
- P/A was soft and non-tender

LABORATORY INVESTIGATIONS-

| PARAMETERS | RESULT (06-06-25) | RESULT (09-06-25) | RESULT (10-06-25) | RESULT (12-06-25) | REFERENCE RANGE |
|--------------------|-------------------|-------------------|-------------------|-------------------|--|
| Hemoglobin | 4.7 | 3.5 | 4.5 | 8.2 | 12-16 g/dl |
| Red Blood Cells | 1.17 | 0.83 | 1.09 | 3.0 | 3.5-5.0*10 ⁶ /mm ³ |
| Hematocrit/PCV | 15.7 | 11.5 | 13.8 | 27 | 33-43% |
| MCV | 133.7 | 137.9 | 127.0 | 103 | 76-100fl |
| MCH | 40.0 | 42.0 | 41.6 | 39 | 27-33pg/cell |
| MCHC | 29.9 | 30.5 | 32.7 | 33 | 33-37 g/dl |
| WBC | 11630 | 11930 | 10990 | 8000 | 4500-11000 cells/cumm |
| Polymorphs | 55 | 68 | 81 | 80 | 40-75% |
| Lymphocytes | 40 | 26 | 15 | 30 | 20-50% |
| Platelets | 5.97 | 2.03 | 2.85 | 3.0 | 1.5-4.5 lacs/cumm |
| RDW-CV | 25.4 | 29.5 | 23.2 | 16.9 | 11.5-14.5% |
| Total Bilirubin | 2.9 | | | | |
| Direct Bilirubin | 0.7 | | | | |
| Indirect Bilirubin | 2.2 | | | | |

LDH- 749 IU/L

Peripheral Smear- Showing features of hemolytic anemia, in correlation with RBC clumping on smear

spherocytes and positive DCT. Autoimmune Hemolytic Anemia is a possibility.
Complement C3- 64.8mg/dl (decrease)

Complement C4- 8.3mg/dl (10-40 mg/dl) decreased
Direct Coombs Test- Positive

ANA- Positive

TREATMENT-

Table-01: Treatment regimen in hospital

| SL NO. | NAME OF DRUG | DOSE | ROUTE | FREQUENCY |
|--------|--------------------------|-------------------|-------------|----------------------|
| 1. | INJ. CEFTRIAZONE | 1g | IV | BD FOR 7 DAYS |
| 2. | INJ. PARACETAMOL | 1g | IV | SOS FOR 7 DAYS |
| 3. | T. B-COMPLEX | 500mg | PO | OD FOR 7 DAYS |
| 4. | T. IFA | 333mg | PO | BD FOR 7 DAYS |
| 5. | INJ. VIT-COFOL | 2cc | IM | OD FOR 5 DAYS |
| 6. | 1PINT PRBC | | IV over 2hr | FOR FIRST 3 DAYS |
| 7. | INJ. IRON SUCROSE | 200mg in 100ml NS | IV | OD FROM DAY 3- DAY 7 |
| 8. | INJ. METHYL PREDNISOLONE | 500mg in 100ml NS | IV | OD FOR 7 DAYS |
| 9. | INJ. PANTOPRAZOLE | 40mg | IV | OD FROM DAY 5- DAY 7 |
| 10. | T. PREDNISOLONE | 10mg | PO | OD FOR 7 DAYS |
| 11. | INJ. FUROSEMIDE | 10mg | IV | BD FROM DAY 5- DAY 7 |
| 12. | T. CETIRIZINE | 10mg | PO | OD FROM DAY 5- DAY 7 |
| 13. | T. HYDROXYCHLOROQUINE | 200mg | PO | BD FROM DAY 5- DAY 7 |

III.DISCUSSION

- Autoimmune hemolytic anemia (AIHA) is a form of anemia caused by immune-mediated destruction of red blood cells within the body.
- A 27-year-old woman presented with complaints of easy fatigability and persistent headache, which are typical symptoms associated with anemia.
- Laboratory investigations showed markedly low hemoglobin levels along with increased MCV and RDW.
- Elevated indirect bilirubin and raised LDH levels indicated ongoing hemolysis.
- The Direct Coombs (Direct Antiglobulin) test was positive, confirming immune involvement in red cell destruction.
- Reduced complement levels (C3 and C4) together with a positive ANA test suggested an autoimmune basis, pointing toward secondary AIHA.
- High-dose intravenous methylprednisolone was initiated as first-line therapy to suppress immune-mediated hemolysis.
- Hemoglobin improved significantly from 3.5 g/dL to 8.2 g/dL, demonstrating a good response to treatment.

- Additional supportive care included transfusion of one pint of packed red blood cells (PRBC), iron supplementation, vitamins, gastric protection, and hydroxychloroquine.
- The management strategy combined symptomatic relief with targeted immunosuppression through a multidisciplinary approach.
- The patient's clinical recovery underscores the importance of early diagnosis and appropriate corticosteroid therapy in AIHA.

IV.CONCLUSION

- Autoimmune hemolytic anemia is a rare but serious hematological emergency that can become life-threatening if not identified and treated at an early stage.
- In young individuals presenting with profound anemia and persistent fatigue without an obvious cause, evaluation for hemolytic anemia should always be considered.
- Diagnostic confirmation relies on timely investigations such as hemoglobin estimation, peripheral smear examination, indirect bilirubin levels, LDH assessment, and a positive Direct Coombs test.
- Early initiation of appropriate corticosteroid therapy, together with adequate supportive measures, significantly improves both symptomatic status and laboratory findings.
- Effective management requires a coordinated multidisciplinary effort, where clinical pharmacists contribute through close therapeutic monitoring, patient-specific counseling, prevention of medication-related complications, and promoting adherence and structured follow-up.

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