A CASE OF SEVERE CEFTRIAXONE-INDUCED IMMUNE HEMOLYTIC ANEMIA

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Background

- Drug-induced immune hemolytic anemia (DIHA) is a rare but potentially fatal complication caused by frequently administered medications like antibiotics.
- As clinical signs are variable and serological investigations are challenging, DIHA may be underdiagnosed.
- We report a 13-year old boy with Tetralogy of Fallot who received intravenous Ceftriaxone to treat endocarditis. On day 23 and 24 of treatment he developed hypotensive shock and acute hemolysis during intravenous drug administration.

Methods

- Standard serological methods such as direct and indirect antiglobulin test (ID-system, Bio-Rad/Grifols, CH) were applied on samples after the second hemolytic crisis.
- An advanced search for drug-dependent antibodies was performed by incubating the patient's sera with group O red blood cells (RBC) in the presence and absence of Ceftriaxone as well as its metabolites (patient's urine sample) as described previously [1].
- Hemoglobin and hemolytic laboratory markers were monitored.

Fig. 3:
Sera from the patient was incubated with group O RBCs in the presence of Ceftriaxone (1) as well as its metabolites (1c) (patient's urine sample). Negative controls: random AB serum instead of the patient's serum (1a) and saline instead of drug (1b)

Results

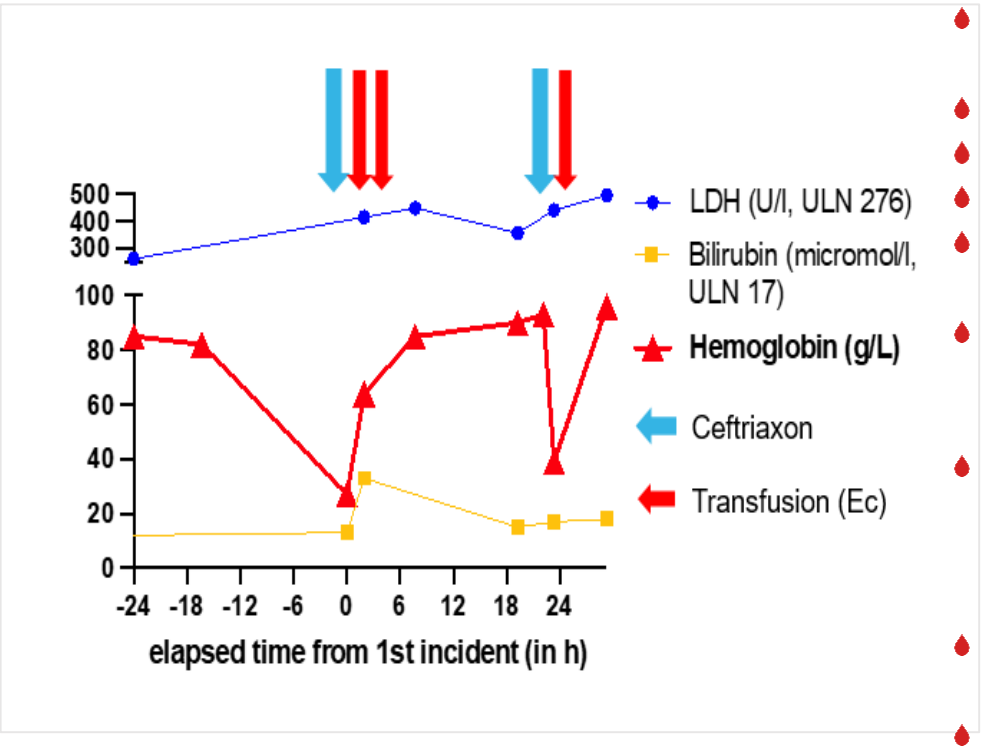

Fig. 1: Follow up of laboratory parameters, hour 0 corresponds to d23.

- Hb dropped from 82 to 27 (day 23) and from 96 to 39g/l (day 24) following IV Ceftriaxone (figure 1).
- Transfusion of three RBC concentrates
- LDH and bilirubin were slightly elevated
- Results of haptoglobin and free hemoglobin were normal
- Serological investigations revealed a strong C3d-positive direct antiglobulin test.
- The serum ab screening test was negative in indirect antiglobulin test (figure 2) and the eluate was non-reactive.
- Serum drawn at the time of the hemolytic reaction was strongly reactive when incubating with RBC in the presence of the drug (3+) and its metabolite (2+), clearly demonstrating presence of Ceftriaxone ab (figure 3).
- Repeated testing d16 after drug cessation showed a similar result.
- On d39 no Ceftriaxone antibodies were detected.

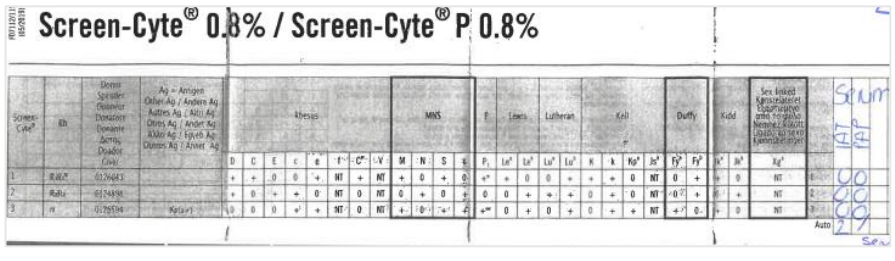

Fig. 2: Initial antibody screening showing negative results

Conclusion

- Here we present a pediatric case with acute, life-threatening Ceftriaxone-dependent hemolysis and hemodynamic instability.
- After discontinuation of Ceftriaxone and administration of Methylprednisolone, Clemastine plus transfusion, hematologic remission was rapid.
- Notably, hemolytic markers remained proportionally unaffected.
- DIHA needs to be considered in individuals with acute, C3d-positive hemolysis coinciding with drug treatment and the relevant medication has to be stopped at once.

Reference

[1] Mayer B, Bartolmäs T, Yürek S, Salama A. Variability of Findings in Drug-Induced Immune Haemolytic Anaemia: Experience over 20 Years in a Single Centre. Transfus Med Hemother. 2015 Sep;42(5):333-9.

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Abstract