PLG|D CONNECTIONS

A FATAL CASE OF TYPE I PLASMINOGEN DEFICIENCY (PLGD) IN AN INFANT WITH MULTIPLE AFFECTED ORGAN SYSTEMS

Literature-Based Case Study: 1-month-old male child (plasminogen activity, 2.2%)§

This patient was diagnosed with Type 1 Plasminogen Deficiency (PLGD) when hospitalized at 28 days of age based on nonresponse of conjunctivitis to antibiotics, signs of hydrocephalus, and repeated vomiting. During hospitalization, respiratory distress with pseudomembranous obstruction of the bronchi and partial lung collapse occurred, leading to fatal respiratory failure 10 days following discharge. The patient was the only son of first cousin Turkish parents.

AGE

3 days

Physical examination
Bilateral conjunctivitis

Initial diagnosis consideration
Gonococcal or chlamydial conjunctivitis

Treatment
Erythromycin, topical antibiotics, and corticosteroids

28 days

Physical examination
Conjunctivitis (did not respond to the initial treatment), vomiting for 7 consecutive days, head circumference above the 97th percentile, bulging large anterior fontanelle, open posterior fontanelle and cranial sutures, both eyes were almost completely closed by ligneous pseudomembranes.

Lab test results
Prothrombin time: 12 sec, activated partial thromboplastin time: 27 sec, fibrinogen level: 263 mg/dl, D-dimer level <0.2 lg/ml, haemoglobin level: 11.5 g/dl, leukocyte count: 14,600/mm^3, platelet count: 426,000/mm^3, sedimentation rate: 76 mm/h, C-reactive protein level: 0.52 mg/dl

CT Scan: Enlargement of all four ventricles

Treatment (conjunctivitis) Intravenous ceftriaxone and clarithromycin, topical ofloxacin and corticosteroids

35 days

Clinical manifestations
Persistent vomiting and progressive hydrocephalus

Subsequent procedures
Ventriculo-peritoneal shunt

Subsequent clinical manifestations
Inspiratory stridor, respiratory distress

Chest X-ray
Atelectasis at the upper segment of the right lung

45 days

Bronchoscopy
Tracheal pseudomembranes (pseudomembrane obstructing the bronchus of the upper segment of the right lung removed)

Chest X-ray (post-bronchoscopy)
No pulmonary atelectasis

Subsequent clinical manifestations
Occasional respiratory distress with one time expectoration of a thick, white, wood-like material followed by disappearance of respiratory distress

Other clinical manifestations
Progressive bilateral hydrocele, unilateral inguinal hernia requiring surgery

Mucosal biopsies (conjunctiva and trachea)
Massive exudation of fibrin with inflammatory cellular infiltration, disrupted epithelium, and areas containing amorphous, eosinophilic, hyaline material

Plasminogen lab results**
Plasminogen activity: 2.2%
Plasminogen antigen: <1.24 mg/dl

Diagnosis
Type I Plasminogen Deficiency (PLGD)

Genetic testing
Homozygous mutation in PLG gene. Both of his parents, who were asymptomatic, were heterozygous for this mutation.

3 months

Recommended inpatient treatment (denied by the parents)
Systemic purified plasminogen replacement therapy

At parent's request, the patient was discharged with topical corticosteroid treatment. He died from respiratory failure 10 days later.

*** Normal levels of plasminogen activity: 70-130%[¥]*
Normal levels of plasminogen antigen: 6-25 mg/dl[§]

References:
§ Ciftci et al. Eur J Pediatr. 2003;162(7):462-465. ¥ Rare bleeding disorders. http://www.rarecoagulationdisorders.org/diseases/plasminogen-deficiency/laboratory-evaluation. Accessed April 21, 2017.

KEY TAKEAWAYS

- PLGD is an ultra-rare genetic disease that can have devastating effects on multiple organ systems.
- This patient developed ligneous conjunctivitis, respiratory distress and hydrocephalus, as well as bilateral progressive hydrocele and unilateral inguinal hernia.
- Authors note that various therapeutic approaches for ligneous conjunctivitis including hyaluronidase eye drops, corticosteroids, cyclosporine, and antiviral agents as well as surgical debridement of pseudomembranes yielded disappointing results in multiple cases.