

## H76 Sudden Death After Methylprednisolone Sodium Hemisuccinate Injection: A Rare Case of Anaphylaxis

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After attending this presentation, attendees will understand a fatal case of anaphylactic shock due to methylprednisolone sodium hemisuccinate in a 19-year-old male, affected by optical neuritis, in treatment with endovenous administration of methylprednisolone sodium hemisuccinate.

This presentation will impact the forensic science community by examining a case that, because of the rarity of anaphylactic shock due to methylprednisolone, underlines the usefulness of the laboratory tryptase enzyme immunoassay, such as a complete immunohistochemical study of all specimens, on blood samples to obtain a correct etiopathogenetic definition in cases of anaphylaxis.

The diagnosis of death from anaphylactic shock is difficult and often misunderstood because it is uncommon. Although anaphylaxis is not a frequent adverse effect of corticosteroid treatment, its diagnosis is very important because of the widespread use of corticosteroids that, due to their efficacy as anti-inflammatory and immunosuppressive agents, are widely used in the treatment of a large number of diseases, such as asthma, allergies, and autoimmune and neoplastic diseases. Adverse reactions due to corticosteroid hypersensitivity, including anaphylaxis (first described in 1974), angioedema, urticaria, generalized cutaneous eruption, and severe bronchospasm occur only in 0.3% of cases involving systemic administration. Corticosteroids probably act as haptens because of their low molecular mass.

The following case concerns a sudden death due to methylprednisolone sodium hemisuccinate administration.

**Case Report:** A 19-year-old healthy male suddenly presented with a decrease in visual acuity more evident in the right eye. After several clinical and instrumental checks including fundus examination, optical computed tomography, and ocular electrophysiology, a right eye retrobulbar optical neuritis was diagnosed. The patient was started on a treatment with 25mg prednisone tablets. After nine days, the patient showed hyperglycemia (glucose concentration of 379mg/dl) associated with the presence of ketone bodies in the urine. Due to this condition, he was prescribed first metformin and then subcutaneous insulin therapy. After five days, the boy was admitted to the emergency department for the persistence of hyperglycemia (400mg/dl). A diagnosis of diabetic ketoacidosis was made and intravenous insulin therapy and hydration with saline and bicarbonate infusion were administered. The following day, he suspended infusion therapy and started subcutaneous insulin therapy. After ten days, because of the worsening vision, the boy started a three-day endovenous administration of Solu-Medrol® in 250cc saline drip with a slow drip of two hours duration. On the second day, after the daily administration, the patient showed cough and spontaneous urinary loss associated with seizures, stupor, and falling to the ground with subsequent cardiopulmonary arrest. The patient died, despite cardiopulmonary resuscitation efforts. An autopsy was performed 24 hours after death. External examination was unremarkable; internal examination showed cerebral edema with moderate swelling of cerebellar tonsils and bilateral pulmonary edema. Histological and immunohistochemical (CD4, CD15, CD68, CD20, CD3, CD8, and CD45) investigation of brain specimens revealed a diffuse cerebral edema in association with bilateral optical neuritis and chiasmal optic neuritis. Lung samples showed subpleural and interstitial hemorrhage, intra-alveolar and diffuse interstitial edema, and acute stasis; other organs were unremarkable.

The laboratory tryptase enzyme immunoassay on blood revealed a tryptase concentration of 136.50mcg/L (n.v. 0.00-15.00mcg/L), greater than the cut-off value of 45µg/l for the diagnosis of anaphylactic shock. The death was attributed to anaphylactic shock due to methylprednisolone sodium hemisuccinate, most probably due to its excipient.

### Corticosteroid, Anaphylaxis, Methylprednisolone