Case Report

Consider systemic capillary leak syndrome in monoclonal gammapathy with shock

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ABSTRACT

Introduction and importance: The capillary leaking syndrome is a very rare disease that can be idiopathic (Clarkson syndrome) or secondary to other pathologies.

Case presentation: We report a case of 37-year-old women who was admitted in the emergency room for a hemodynamic shock of neither cardiac nor septic cause, and the patient wasn’t presenting any bleeding. The investigations showed that the diagnosis was a Clarkson syndrome crisis and the patient was having supportive treatment containing fluid therapy, vasoactive drugs, and ECMO. And died after 48h of hospitalization.

Clinical discussion: the capillary leaking syndrome is a very fatal affection, its physiopathology is unknown. It evolve by crisis made by hypotension and anasarca, in severe cases it is presented as fatal hemodynamic shock. Biological investigations show hemoconcentration associated with hypoalbuminemia which is pathognomonic of the disease. The treatment is essentially based on crisis treatment support by fluid therapy, vasoactive drugs, some practicien report the use of theophyllin for prevention but without any proven efficiency.

Conclusion: For all this reasons we are in the obligation of investing in fundamental studies to better understand this fatal disease.

1. Introduction

The capillary leaking syndrome is a very rare cause of hemodynamic shock that is life threatening, few cases were reported, and actually this disease remains a real problem for practitioners for its high mortality rate. The clinical presentation is marked by the appearance of recurrent episodes of effusions that can lead to fatal hemodynamic shock. We report a case of 37 years old patient having a history of five episodes of hypotension associated with anasarca admitted for hemodynamic shock state ibecause of capillary leaking syndrome.

2. Case presentation

We report the case of a 37-year-old woman, with a history of 5 episodes of hypotension with generalized edema spontaneously reversible in 2 years, admitted for the management of asthenia with edema of the lower limbs reaching the thigh for 4 days with a recent weight gain estimated at 8kg in 2 days. The initial evaluation found patient, hemodynamically unstable with unfound blood pressure and Heart Rate = 157 bpm, cold extremities, an elongated refilling capillary time, respiratory, FR = 34 cpm with SpO2 = 97% on room air, G = 1.17 and T° = 36.7, the patient is oligo-anuric.

The physical examination found a patient in a state of complete anasarca with no signs of right heart failure, cardiac examination is without particularities apart from tachycardia, pleuropulmonary auscultation finds bilateral snoring rales.

Vascular filling with 3 L of 0.9% saline solution is performed without hemodynamic or renal response requiring the introduction of Norepinephrine with a dose of 0.4 μg/kg/min after taking a central venous approach with an initial central venous pressure (CVP) estimated at 1 mmhg.

An electrocardiogram (EKG) was performed and did not show any repolarization disorders, on transthoracic echocardiography there were no signs of acute pulmonary heart, nor any segmental or global kinetic disorders that could explain this picture, the left ventricular ejection fraction (LVEF) was estimated at 50%, the inferior vena cava was...
and then hemodynamically stabilized with epinephrine with a Blood Pressur: 90/50 mmhg. The evolution is marked by the clinic-biological a NO FLOW at 0 and a LOW FLOW at 13 min, the patient was intubated at 0.97 and albumin at 16 g/l with a normal infectious work-up and logical cultures were negative. Blood gas monitoring always showed an rhabdomyolysis.

Continuous replacement therapy of the Kidney, with the installation of a aggravation of the renal function requiring the introduction of a pressor with generalized edema and the presence of hemoconcen-
tion of dobutamine with no hemodynamic response.

The electrophoresis of the blood proteins found a monoclonal peak of type IgG kappa in favour of our diagnostic hypothesis, the microbio-

Table 1

| Variables               | Reference range | H0   | H10  | H24  | H36  | H40  |
|-------------------------|-----------------|------|------|------|------|------|
| Complete blood cell count |                 |      |      |      |      |      |
| White blood cells (/μl)  | 400-10000       | 6580 | 7500 | 6300 | 9600 | 104,000 |
| Segment neutrophil (/μl) | 1500-7000       | 4670 | 5320 | 5019 | 4870 | 5309  |
| Lymphocyte (/μl)         | 1000-4000       | 1760 | 1540 | 2013 | 1875 | 1748  |
| Hemoglobin (g/dl)        | 12-16           | 19.7 | 20.3 | 21.4 | 19.4 | 20.1  |
| Platelets (× 10^9/μl)    | 15-40           | 21.9 | 14.7 | 10.34| 5.34 | 4.29  |
| Hematocrit (%)           | 37-49           | 69   | 72.3 | 70   | 67.9 | 78.3  |

Blood chemistry
- Sodium (mmol/l) 135-145
- Potassium (mmol/l) 3.5-5.0
- Glucose (g/l) 0.7-1.05
- C-reactive protein (mg/l) 0-5
- Procalcitonin (ng/ml) 0.00-0.05
- Total protein (g/dl) 64-83
- Albumin (g/l) 35-50
- Blood Urea nitrogen (g/l) 0.15-0.45
- Creatinine (mg/l) 6-11
- Total bilirubin (mg/l) 4-16
- Aspartate aminotransferase (U/l) 5-34
- Alanine aminotransferase (U/l) 0-55
- Alkaline phosphatase (U/l) 40-150
- Lactate dehydrogenase (U/l) 124-222
- Creatinine kinase (U/l) 60-250
- Blood coagulation
  - Prothrombin time (%) 75-100
  - Partial thrombin time (sec) 24-29
  - Fibrinogen (g/l) 2-4
  - D-dimer (mg/l) < 0.5

 pulses collapsed. The biological assessment performed on admission showed: Hemoglobin at 19.7 g/dl, Hematocrit at 69%, creatinine at 21 mg/l, urea at 0.97 and albumin at 16 g/l with a normal infectious work-up and negative proteinuria (Table 1). The arterial blood gaz on admission showed a non-compensated metabolic acidosis with hyperlactatemia at 7.37 mmol/l (Table 2).

Given the absence of criteria for cardiogenic or septic shock and the absence of active bleeding, the history of 5 recurrent episodes of hy-

Table 2

| Variables               | Reference range | H0   | H10  | H24  | H36  | H40  |
|-------------------------|-----------------|------|------|------|------|------|
| pH                      | 7.37-7.43       | 7.04 | 7.09 | 7.14 | 6.98 | 6.87 |
| PaO2 (mmhg)             | 60              | 78.7 | 146  | 172  | 174  | 169  |
| SaO2 (%)                | 50-80           | 79.8 | 40.7 | 39.9 | 30.8 |      |
| HCO3- (mmol/l)          | 22-26           | 5.98 | 7.3  | 10.8 | 6.98 | 3.8  |
| Hb (g/dl)               | 13-17           | 21.9 | 19.7 | 20.3 | 18.6 | 19.76|
| SaO2 (%)                | 94              | 91   | 93   | 90   | 94   | 89   |
| Lactate (mmol/l)        | 0-2             | 7.64 | 12.8 | 9.72 | 14.78| 15.98|
justifying that treatment by an angioprotein 2 inhibitor and intravenous immunoglobulin significantly decreasing capillary permeability while the VEGF inhibitor (bevacizumab) exerted a minimal effect [4].

Since the first description of Clarkson’s syndrome several treatments have been tried, initially beta mimetic treatment combined with theophylline was administered without consistent results. Recently, intra venous Immuno Globulin (IVIG) treatment for seizure prophylaxis at a dose of 2g/kg/month over 48 hours has reduced the frequency and severity of seizures and is recommended by the authors of this study of patients in the European registry [5,6]. In addition, IVIG treatment may be effective during attacks according to limited data [7].

This case is written following the SCARE guidelines [8].

4. Conclusion

We hope that fundamental researches can study more cases of this pathology and make advances that can deliver the diagnostic, prognostic, and therapeutic tools sorely needed to combat this devastating disease.

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Ethical approval

The ethical committee approval was not required give the article type (case report). However, the written consent to publish the clinical data of the patients was given and is available to check by the handling editor if needed.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Ounci Es-saad: study concept or design, data collection, data analysis or interpretation, writing the paper. Amine Bouchlarhem: data analysis or interpretation, writing the paper. Oussama Lamzouri: data analysis or interpretation, writing the paper. Leila Haddar: data collection. Hamza mimouni: data collection. Houssam bkiyar: supervision and data validation. Brahim Housni: supervision and data validation.

Registration of research studies

This is not an original research project involving human participants in an interventional or an observational study but a case report. This registration is was not required.

Guarantor

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Declaration of competing interest

None.

References

[1] B. Clarkson, D. Thompson, M. Horwith, E.H. Luckey, Cyclical edema and shock due to increased capillary permeability, Am. J. Med. 29 (1960) 193–216.
[2] L. Duron, F. Delestre, Z. Amoura, L. Arnaud, Syndrome de fuite capillaire idiopathique et formes secondaires : une revue systematique de la litterature [Idiopathic and secondary capillary leak syndromes: A systematic review of the literature], Rev. Med. Interne. 36 (6) (2015) 386–394, https://doi.org/10.1016/j.revmed.2014.11.005. Epub 2015 Jan 15. PMID: 25600329.
[3] M. Cicardi, M. Gardinali, G. Bisiani, A. Rosti, P. Allavena, A. Agostoni, The systemic capillary leak syndrome: appearance of interleukin-2-receptor-positive cells during attacks, Ann. Intern. Med. 113 (1990) 475–477.
[4] Z. Xie, C.C. Ghosh, R. Patel, S. Ivaki, D. Gaskins, C. Nelson, et al., Vascular endothelial hyperpermeability induces the clinical symptoms of Clarkson disease (the systemic capillary leak syndrome), Blood 119 (2012) 4321–4332.
[5] Z. Amoura, T. Papo, J. Ninet, P.Y. Hatron, J. Guillaumie, A.M. Piette, et al., Systemic capillary leak syndrome: report on 13 patients with special focus on course and treatment, Am. J. Med. 103 (1997) 514–519.
[6] P. Kapoor, P.T. Greipp, E.W. Schaefer, S.J. Mandrekar, A.H. Kamal, N. C. GonzalezPaz, et al., Idiopathic systemic capillary leak syndrome (Clarkson’s disease): the Mayo clinic experience, Mayo Clin. Proc. 85 (2010) 905–912.
[7] M. Lambert, D. Launay, E. Hachulla, S. Morell-Dubois, V. Soland, V. Queyrel, et al., High-dose intravenous immunoglobulins dramatically reverse systemic capillary leak syndrome, Crit. Care Med. 36 (2008) 2184, https://doi.org/10.1097/CCM.0b013e318177c71.
[8] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.