CASE REPORT
Bali Dermatology Venereology and Aesthetic Journal (BDVAJ) 2025, Volume 8, Number 1, 22-26
P-ISSN : 3046-7985, E-ISSN : 3046-7993

Published by
Department of Dermatology and Venereology, Universitas Udayana

Drug reaction with eosinophilia and systemic symptoms (DRESS) with acute kidney injury and transaminitis: A rare case

Stefani Luziani[1*], Nina Roslina[2], Rio Zakaria[3], Sumarmi[4]

[1]Internship Doctor, 45 Kuningan Hospital, Kuningan, West Java, Indonesia;
[2]Department of Dermatology and Venereology, 45 Kuningan Hospital, Kuningan, West Java, Indonesia;
[3]Department of Internal Medicine, 45 Kuningan Hospital, Kuningan, West Java, Indonesia;
[4]Medical Doctor, 45 Kuningan Hospital, Kuningan, West Java, Indonesia.

*Corresponding author:
Stefani Luziani;
Internship Doctor, 45 Kuningan Hospital, Kuningan, West Java, Indonesia;
stefani_luziani@hotmail.com

Submitted: 2024-11-23
Accepted : 2025-06-28
Published: 2025-06-30

ABSTRACT

Background: Drug reaction with eosinophilia and systemic symptoms (DRESS) is a rare, serious, and potentially life-threatening drug hypersensitivity reaction. The diagnosis of DRESS can be challenging to make because of the highly variable clinical presentation, progressive onset of manifestations, and the extended period from drug exposure to onset. Many DRESS cases remain undiagnosed or misdiagnosed. This study aims to report a rare case of an adult patient with DRESS to expand our knowledge and avoid delayed identification and treatment.
Case: A 31-year-old male presented to the emergency department with a chief complaint of itchy, red desquamation rashes all over his body, with fever and swelling on his face. The dermatological status obtained was a generalized distribution; on nearly the entire body surface area, there were multiple lesions, confluent, with unclear boundaries, irregular in shape, plaque-sized, not raised, dry, in the form of erythematous macules with scales and light yellow crusts. Hematological laboratory analysis revealed hypereosinophilia. The renal function indicated a decreased eGFR of over 75%, and the hepatic function test revealed an elevated in liver function. The patient was diagnosed with DRESS, acute kidney injury, and transaminitis. There was an improvement in the patient's condition following the withdrawal of the previous medications and the administration of intravenous dexamethasone, oral antihistamine, and symptomatic treatment.
Conclusion: Early identification and withdrawal of all suspected medications are essential for the management of DRESS, as a delayed diagnosis can be life-threatening. The administration of systemic steroids is efficacious for the treatment of DRESS.

Keywords: DRESS, drug reaction, eosinophilia, kidney injury, rare case.
Cite This Article: Luziani S, Roslina N, Zakaria R, Sumarmi,Drug reaction with eosinophilia and systemic symptoms (DRESS) with acute kidney injury and transaminitis: A rare case. *Bali Dermatology Venereology and Aesthetic Journal*. 2025;8(1):22-26. DOI: 10.51559/balidervenaesthj.v8i1.108

INTRODUCTION

Drug reaction with eosinophilia and systemic symptoms (DRESS) is a severe and potentially life-threatening drug hypersensitivity reaction characterized by fever, eosinophilia, skin rash (often a maculopapular eruption), lymphadenopathy, viral reactivation, and/or involvement of visceral organs (most often the liver or kidney).[1–3] It has been linked to short-term and long-term morbidity and mortality.[4] DRESS is a rare disease, with an estimated 10 cases per million yearly. Nevertheless, the incidence of DRESS in new users of antiepileptic medications (particularly carbamazepine and phenytoin) may range from 1/1000 to 1/10,000. A slight female predominance is observed in DRESS patients, with a male/female ratio of 0.7-0.8. The average age of patients at the time of DRESS diagnosis is approximately 50–55 years. Less than 10% of patients are under the age of 20.[1]

Pharmacological substances that induce DRESS include antiepileptic medications (particularly carbamazepine), allopurinol, antibacterial medications (antibiotics, antituberculosis medicines), sulfonamides (particularly dapsone and sulfasalazine), antiviral medications, antipyretics/analgesics, fluindione, and mexiletine.[1,5–8] The clinical manifestations of DRESS typically commence with a sudden increase in fever (38–40°C), diffuse skin rash, xerostomia, lymphadenopathy, and signs of organ involvement. These symptoms manifest between 2–3 weeks and 12 weeks following the causative medication.[1,5,8–10] As a systemic disease, different organs may be affected in DRESS, with the liver (75%–94%), kidney (12%–40%), lung (30%–35%), and heart (4%–27%) being the most prevalent.[6,11–13]

The diagnosis of DRESS can be challenging to make because of the highly variable clinical presentation, progressive onset of manifestations, and the extended period from drug exposure to onset. Many DRESS cases remain undiagnosed or misdiagnosed.[1,9] Conversely, DRESS may induce complications, including sepsis, *Pneumocystis jirovecii* pneumonia, myocarditis, gastrointestinal bleeding, and liver failure, which can result in morbidity and mortality in patients.[1]

A comprehensive medical history and physical examination are essential for identifying the medication responsible for DRESS and signs and symptoms of skin and other organ involvement.[4] Case

reports regarding DRESS are still limited, especially in Indonesia. This study aims to report a rare case of an adult patient with DRESS, acute kidney injury, and transaminitis to expand our knowledge and avoid delayed identification and treatment.

CASE REPORT

A 31-year-old male presented to the emergency department with a chief complaint of itchy, red desquamation rashes all over his body, with fever and swelling on his face that had worsened two hours before hospitalization. The initial symptom manifested two weeks before hospital admission as red desquamation rashes and pruritic areas widespread throughout the body (Figure 1) after the patient's use of medication from the General Practitioner Clinic for the treatment of a neck abscess. The patient was prescribed seven medications at the General Practitioner Clinic, specifically paracetamol, methylprednisolone, mefenamic acid, cefadroxil, and three more medications, all in unpackaged white tablets. The patient was then admitted to the hospital for 5 days and had surgical procedures, including incision and drainage, to treat a neck abscess. Upon discharge, the patient exhibited signs of recovery and was prescribed four different medications. The prescribed medications are cefixime, ketorolac, omeprazole, and *Stichopus hermannii* extract. The patient consumed the medication prescribed by the hospital for ten days.

The cutaneous lesions reemerged as erythematous macules and pruritus approximately 21 hours before the patient arrived at the hospital for the second time. Shortly after that, the patient experienced facial and periorbital edema, as well as a fever, nine hours before hospitalization. Additionally, the patient experienced desquamation on nearly the entire body surface area two hours before hospitalization, as the complaints continued to deteriorate (Figure 2). Additional symptoms reported by the patient include xerostomia, aphthous stomatitis, and dysphagia. The patient has a medical background of atopy characterized by urticaria upon stimulation with cold temperatures.

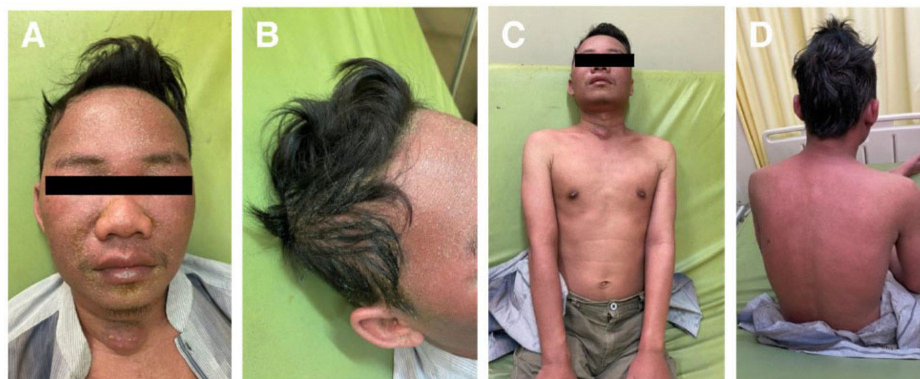

Figure 1. Clinical photograph of the patient taken two weeks before his second hospitalization. The appearance of multiple erythematous macules with scales and light yellow crusts is seen on the face (A), scalp (B), chest and abdomen (C), and back (D).

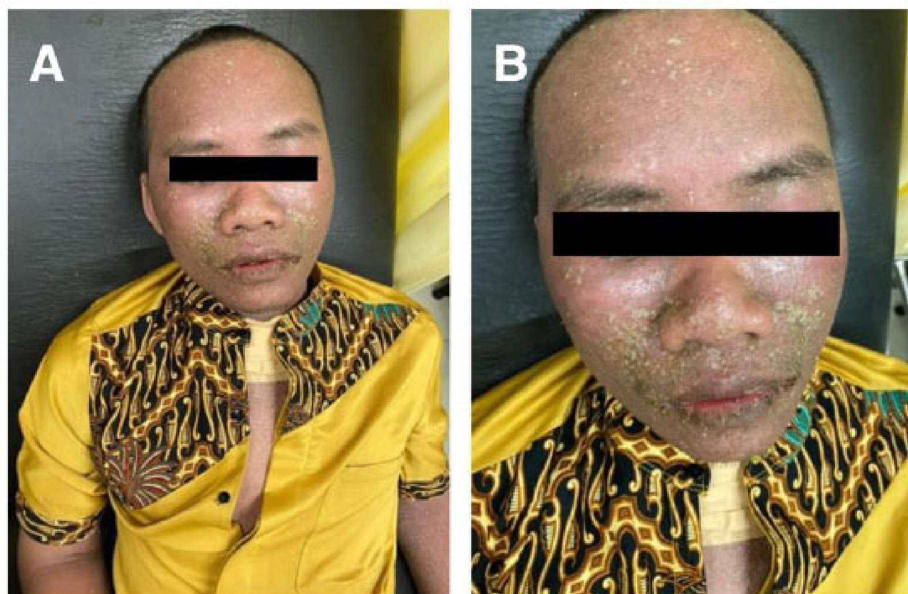

Figure 2. Clinical photograph of the patient captured during the patient's second hospitalization. Multiple erythematous macules with scales and light yellow crusts are seen on the face (A and B).

Upon physical examination, the patient had dry oral mucosa, aphthous stomatitis on the tip of the tongue, shedding of the lip mucosa, and a surgical scar in the middle of the front neck. The dermatological status obtained was a generalized distribution; on nearly the entire body surface area, there were multiple lesions, confluent, with unclear boundaries, irregular in shape, plaque-sized, not raised, dry, in the form of erythematous macules with scales and light yellow crusts. Hematological laboratory analysis revealed a hemoglobin level of 12.5 g/dL, hematocrit level of 37.2%, erythrocyte count of 4.05 million/µl, and leukocyte count of 12.290/µl, with a predominant leukocyte count of eosinophil cells at 17%. The hepatic function test revealed an AST value of 64 U/L and an ALT value of 191 U/L. Assessment of renal function showed a urea level of 107 mg/dL, a creatinine level of 5.03 mg/dL, and an eGFR of 13.5 ml/min/1.73 m^2. The electrolyte analysis revealed serum sodium levels of 126 mEq/L and calcium ion (Ca++) levels of 1.10 mmol/L.

After evaluating the patient according to the European Registry of Severe Cutaneous Adverse Reaction (RegiSCAR) criteria, we determined that the patient had a score of six, which indicates Definite DRESS. According to the Bocquet criteria, the patient fulfilled all three criteria (exhibiting a cutaneous drug eruption, one hematological, and one systemic

Figure 3. Clinical photograph of the patient captured on the seventh day of hospitalization. The appearance of multiple hyperpigmented macules with scales is seen on the face (A), neck and thorax (B), upper extremities (C), and lower extremities (D).

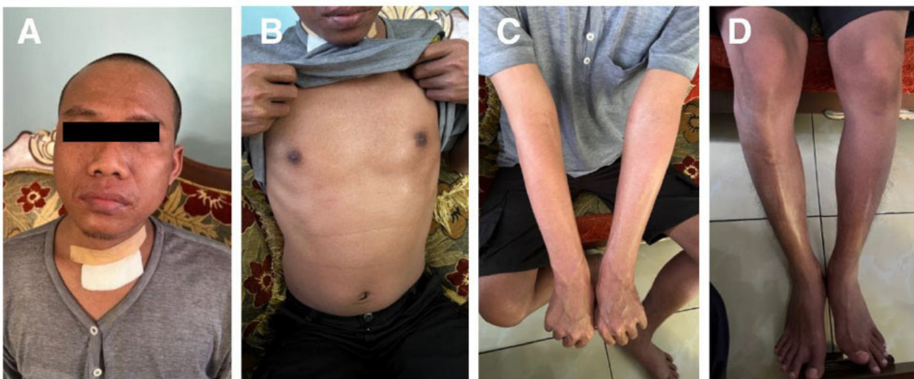

Figure 4. Clinical photograph of the patient captured 11 days post-hospitalization. Multiple hyperpigmented macules appear on the face (A), thorax (B), upper extremities (C), and lower extremities (D).

abnormality), resulting in a DRESS. Meanwhile, according to the Japanese Research Committee on Severe Cutaneous Adverse Reaction (J-SCAR) criteria, the patient fulfilled the first five criteria, resulting in atypical DIHS. The patient's creatinine value was 5.03 mg/dL, which indicates a threefold increase in serum creatinine. Additionally, the patient's eGFR was 13.5 ml/minute/1.73 m^2, which indicates a decrease in GFR of over 75%. Therefore, the patient suffered acute kidney injury, as indicated by the RIFLE criteria for failure.

The patient was diagnosed with drug reaction with eosinophilia and systemic symptoms (DRESS), acute kidney injury, transaminitis, anemia, hyponatremia, and wound dehiscence in the neck region. The patient was subsequently hospitalized and given a 0.9% NaCl compressed treatment twice daily to the reddish and dry skin areas. Additionally, intravenous fluid drops in the form of 0.9% NaCl 500 ml were administered every 8 hours, dexamethasone 10 mg every 24 hours intravenously, omeprazole 40 mg every 24 hours intravenously, paracetamol 500 mg every 8 hours intraorally, N-acetylcysteine 200 mg every 8 hours intraorally, cetirizine 10 mg every 24 hours intraorally, *Curcuma xanthorrhiza* extract 20 mg intraorally twice daily, and 10% urea cream was applied to the dry skin areas twice daily.

A follow-up blood test on the fifth day of hospitalization revealed elevated urea and creatinine levels of 118 mg/dL and 6.12 mg/dL, respectively. The patient was transferred to the Intensive Care Unit (ICU) on the seventh day for the installation of a double-lumen catheter and was scheduled for hemodialysis the next day. The clinical photo of the patient on the seventh day of hospitalization is shown in Figure 3. The skin lesions, which were initially erythematous macules, have developed into hyperpigmented macules.

A repeat renal function test was conducted on the eighth day of hospitalization, resulting in a decreased urea level of 73 mg/dL and a creatinine level of 3.17 mg/dL. The CDL and hemodialysis plans were canceled. Additionally, a hematological examination revealed eosinophils of 1%. The patient was discharged from the hospital on the ninth day of therapy. The patient was also instructed to maintain a record of the medications that have caused the appearance of redness. In addition, patients are encouraged to undergo a follow-up examination at the dermatology clinic, internal medicine clinic, and surgery clinic upon discharge from the hospital to evaluate the patient's condition. Clinical photographs were captured again 11 days post-hospitalization, as shown in Figure 4. The patient's skin lesions have markedly improved, and no red rashes, desquamation, or scales are visible on the body surface area.

DISCUSSION

Drug reaction with eosinophilia and systemic symptoms (DRESS) is the result of a complex interaction involving genetic factors, drug (or vaccine or biologic) exposure, and viral reactivation. The cumulative effect of congruent risks, which can be likened to a "Swiss Cheese" model, is believed to be why some individuals experience DRESS while others do not, despite all having the same exposure.[14] The exact pathogenesis of DRESS is unknown; however, it is generally believed to be a hypersensitivity reaction to a drug mediated by T cells.[1,8,15]

Three hypotheses have been used to elucidate the interactions between medications or metabolites and immunological responses: the hapten/pro-hapten, pharmacological interaction (p-i), and modified peptide repertoire models. The hapten/pro-hapten hypothesis posits that a drug or its metabolite bonds covalently to an endogenous protein and is processed and subsequently presented by antigen-presenting cells, where it is identified as a foreign antigen. According to the pharmacological interaction (p-i) hypothesis, drugs or their metabolites can induce a T-cell response by non-covalently binding to major histocompatibility complex (MHC) proteins or T-cell receptors in a peptide-independent manner. Concurrently, the altered peptide

repertoire model hypothesis posits that the drug or its metabolite adheres directly to the binding groove on the MHC protein, thereby altering the specificity of the peptide on MHC binding. Subsequently, this peptide is identified as a foreign object, which induces a T-cell response.[1,16]

The development of DRESS is not contingent upon the dose administered and may occur during the initial treatment. Approximately half of DRESS patients had experienced a previous infection within the past month, with a virus such as herpes zoster being the most prevalent. Drug-specific T cells are present in patients with DRESS, and it is postulated that viruses significantly contribute to the development and activation of these cells. Reactivation of Human herpesvirus 6 (HHV-6) and/or other herpes viruses such as HHV-7, cytomegalovirus (CMV), Epstein-Barr virus, and varicella zoster virus is observed in most DRESS patients.[1,17]

The cutaneous eruption in individuals with DRESS typically affects more than 50% of the body's surface area and may progress to erythroderma. Typically, the palms of the hands and soles of the feet remain unaffected. The cutaneous lesions are often polymorphic, described as maculopapular, pustular, urticarial, bullous, lichenoid, eczema-like, or target-like. Facial and periorbital edema are present in 75% of the patients. Approximately 50% of individuals may experience mucosal involvement, particularly affecting the lips and oral cavity. Some patients also experience xerostomia, a dry mouth condition that can cause difficulty swallowing or eating. Approximately 70% of patients experience lymphadenopathy and discomfort, particularly in the cervical, axillary, or inguinal regions. In some cases, this condition may also be accompanied by swelling of the salivary glands on both sides.[5,8–10]

The infiltration of eosinophils or specific lymphocytes into the tissues is the cause of organ involvement in DRESS. The liver and kidneys are the organs most frequently affected in sequence, in addition to hematologic abnormalities. An estimated 75-94% of patients with DRESS have hepatic involvement.[1] While transaminitis is the most prevalent liver involvement, certain patients may even develop fulminant liver failure.[4] A retrospective study by Ichai *et al.* examined 16 DRESS patients who suffered from Severe Acute Liver Injury (sALI) or Acute Liver Failure (ALF). The study revealed that patients who had hepatic encephalopathy at admission either required liver transplantation or died. Furthermore, the levels of Factor V recorded upon hospital admission (day 0), Prothrombin Time (PT) on day 1, and PT or Factor V levels on day 2 were significantly lower in patients whose condition deteriorated compared to patients who showed improvement.[18] DRESS patients who have viral reactivation, particularly of HHV-6 and CMV, are at a higher risk of developing liver disease because of the direct infiltration of CMV into the liver.[4]

Based on a retrospective study conducted by Madigan *et al.*, renal involvement was observed in 75% of patients in the cohort who developed DRESS caused by vancomycin, as opposed to 50% of patients who developed DRESS caused by allopurinol and 25% of patients who developed DRESS caused by trimethoprim-sulfamethoxazole (TMP-SMX).[19] Kidney organ involvement can vary from mild increases in creatinine to severe interstitial nephritis.[4]

Patients with DRESS are also susceptible to the development of long-term autoimmune sequelae, which may develop up to four years after the acute phase has resolved.[4] A study conducted by Chen *et al.* in Taiwan reported an overall incidence of long-term sequelae at 11.5% among 52 DRESS patients. The most prevalent sequelae are diabetes mellitus, autoimmune thyroiditis, alopecia areata, and autoimmune hemolytic anemia.[20] Patients who have been diagnosed with DRESS must discontinue all medications that they have previously taken.[1,11,17]

The patient in this case is consistent with the literature or previous publications. Similarities that can be evaluated from this case compared to the previous publication or literature are that the patient's chief complaints were high fever and the appearance of itchy red rashes. The initial episode occurred 2 weeks earlier, and then symptoms reappeared 21 hours before the patient was admitted to the hospital for the second time. This is in accordance with the previous literature review, which states that 25% of all patients with DRESS will experience one or more exacerbations (flare-ups) after the initial episode. After consuming the causative drug, patients experience DRESS for a duration of 2-3 weeks to 12 weeks. This is consistent with the patient's experience in this case, in which the initial symptoms manifested within 2-3 weeks of consuming the causative drug. The dermatological findings are also consistent with the literature, which shows that an exfoliative dermatitis drug eruption, typically symmetrical, affects the trunk and extremities. There was an improvement in the patient's condition following the withdrawal of the previous medications and the administration of intravenous dexamethasone, oral antihistamine, and symptomatic treatment.[1,4,5,8,14]

CONCLUSION

Early identification and withdrawal of all suspected medications are essential for the management of DRESS, as a delayed diagnosis can be life-threatening. The administration of systemic steroids is efficacious for the treatment of DRESS.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

PATIENT'S CONSENT

The patient provided written informed consent to use his image or clinical history for research publication.

FUNDING

The authors personally funded this study.

AUTHORS CONTRIBUTIONS

SL, NR, RZ, SS: conceptualization. SL, NR, RZ: investigation and resources. SL, NR, RZ, SS: Original draft of the manuscript. SL, NR, RZ, SS: visualization. SL, NR, RZ, SS: validation, review, and manuscript editing. All authors read and approved the final manuscript.

REFERENCES

1. Groot AC. Patch testing in drug reaction with eosinophilia and systemic symptoms (DRESS): A literature review. Contact Dermatitis. 2022;86(6):443–479. DOI: 10.1111/cod.14090
2. Jevtic D, Dumic I, Nordin T, et al. Less known gastrointestinal manifestations of drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome: A systematic review of the literature. J Clin Med. 2021;10(18). DOI: 10.3390/jcm10184287
3. Schunkert EM, Divito SJ. Updates and Insights in the Diagnosis and Management of DRESS Syndrome. Curr Dermatol Rep. 2021;10(4):192–204. DOI: 10.1007/s13671-021-00348-z
4. Cardones AR. Drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome. Clin Dermatol 2020;38(6):702–711. DOI: 10.1016/j.clindermatol.2020.06.008
5. Santiago LG, Morgado FJ, Baptista MS, Gonçalo M. Hypersensitivity to antibiotics in drug reaction with eosinophilia and systemic symptoms (DRESS) from other culprits. Contact Dermatitis 2020;82(5):290–296. DOI: 10.1111/cod.13462
6. Jörg L, Helbling A, Yerly D, Pichler WJ. Drug-related relapses in drug reaction with eosinophilia and systemic symptoms (DRESS). Clin Transl Allergy 2020;10(1). DOI: 10.1186/s13601-020-00359-2
7. Ogawa K, Morito H, Hasegawa A, et al. Identification of thymus and activation-regulated chemokine (TARC/CCL17) as a potential marker for early indication of disease and prediction of disease activity in drug-induced hypersensitivity syndrome (DIHS)/drug rash with eosinophilia and systemic symptoms (DRESS). J Dermatol Sci 2013;69(1):38–43. DOI: 10.1016/j.jdermsci.2012.10.002
8. Kim GY, Anderson KR, Davis DMR, Hand JL, Tollefson MM. Drug reaction with eosinophilia and systemic symptoms (DRESS) in the pediatric population: A systematic review of the literature. J Am Acad Dermatol 2020;83(5):1323–1330. DOI: 10.1016/j.jaad.2020.03.081
9. Wolfson AR, Zhou L, Li Y, Phadke NA, Chow OA, Blumenthal KG. Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) Syndrome Identified in the Electronic Health Record Allergy Module. Journal of Allergy and Clinical Immunology: In Practice 2019;7(2):633–640. DOI: 10.1016/j.jaip.2018.08.013
10. Filippis R de, Soldevila-Matías P, Fazio P De, et al. Clozapine-related drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome: a systematic review. Expert Rev Clin Pharmacol. 2020;875–883. DOI: 10.1080/17512433.2020.1787831
11. Taweesedt PT, Nordstrom CW, Stoeckel J, Dumic I. Pulmonary manifestations of drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome: A systematic review. Biomed Res Int. 2019;1-11. DOI: 10.1155/2019/7863815
12. Sharifzadeh S, Mohammadpour AH, Tavanaee A, Elyasi S. Antibacterial antibiotic-induced drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome: a literature review. Eur J Clin Pharmacol. 2021;77(3):275–289. DOI: 10.1007/s00228-020-03005-9
13. Cabañas R, Ramírez E, Sendagorta E, et al. Spanish guidelines for diagnosis, management, treatment, and prevention of dress syndrome. J Investig Allergol Clin Immunol 2020;30(4):229–253. DOI: 10.18176/jiaci.0480
14. Stirton H, Shear NH, Dodiuk-Gad RP. Drug Reaction with Eosinophilia and Systemic Symptoms (DReSS)/Drug-Induced Hypersensitivity Syndrome (DiHS)—Readdressing the DReSS. Biomedicines. 2022;10(5). DOI: 10.3390/biomedicines10050999
15. Hollingsworth P, Paci K, Evans M, Miedema J, Morrell DS. Alopecia universalis after drug reaction with eosinophilia and systemic symptoms (Dress). Pediatr Dermatol 2020;37(5):947–949. DOI: 10.1111/pde.14217
16. Palma-Grisi JC Di, Vijayagopal K, Muslimani MA. Case reports of DRESS syndrome and symptoms consistent with DRESS syndrome following treatment with recently marketed monoclonal antibodies. Autoimmune Dis. 2019;1-6. DOI: 10.1155/2019/7595706
17. Behera SK, Das S, Xavier AS, Selvarajan S. DRESS syndrome: a detailed insight. Hosp Pract (1995). 2018;46(3):152–162. DOI: 10.1080/21548331.2018.1451205
18. Ichai P, Laurent-Bellue A, Saliba F, et al. Acute Liver Failure/Injury Related to Drug Reaction with Eosinophilia and Systemic Symptoms: Outcomes and Prognostic Factors. Transplantation 2017;101(8):1830–1837. DOI: 10.1097/TP.0000000000001655
19. Madigan LM, Fox LP. Vancomycin-associated drug-induced hypersensitivity syndrome. J Am Acad Dermatol 2019;81(1):123–128. DOI: 10.1016/j.jaad.2019.02.002
20. Chen YC, Chang CY, Cho YT, Chiu HC, Chu CY. Long-term sequelae of drug reaction with eosinophilia and systemic symptoms: A retrospective cohort study from Taiwan. J Am Acad Dermatol 2013;68(3):459–465. DOI: 10.1016/j.jaad.2012.08.009

This work is licensed under a Creative Commons Attribution