**Supplementary Content**

YJ Kim, HJ Yang, CH Won, SE Chang, MW Lee, WJ Lee. Clinicoprognostic study of hydroa vacciniforme-like lymphoproliferative diseases: A systematic review.

**eTable1.** Search Strategy for MEDLINE

**eTable2.** Methodologic Quality Assessment for Each Included Study

**Supplementary Table 1.** Characteristics of the patients of the Asan Medical Center

**Supplementary Table 2.** Treatment data available for 264 HVLPD patients

**Supplementary Table 3.** Treatment and response data available for classic HV patients

**Supplementary Table 4.** Treatment and response data available for severe HV/HVLL patients

**Supplementary Table 5.** Risk factors for the progression and development of secondary lymphoma and parameters affecting overall survival

**eReferences.**

This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1. Search Strategy for MEDLINE**

|  |  |
| --- | --- |
| #1 | "Hydroa Vacciniforme"[Mesh] |
| #2 | "Hydroa Vacciniforme"[TW] OR "hydroa vacciniform"[TW] |
| #3 | #1 OR #2 |
| #4 | "Lymphoproliferative Disorders"[Mesh] |
| #5 | Lymphoproliferativ\*[TW] OR Lymphoma\*[TW] OR eruption\*[TW] |
| #6 | #4 OR #5 |
| #7 | #3 AND #6 |
| #8 | #7 AND English[Lang] |

**eTable2. Methodologic Quality Assessment for Each Included Study**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 　 | Did the patient(s) represent all or consecutive case(s) of the medical center? | Was the diagnosis correctly made? | Were other important diagnoses excluded? | Were all important data cited in the report? | Was the outcome correctly ascertained? | Overall methodologic quality　 |
| Barrionuevo 2002 | Y | Y | Y | Y | Y | Good |
| Beltran 2014 | Y | Y | Y | Y | Y | Good |
| Boddu 2015 | N | Y | Y | Y | Y | Moderate |
| Brauns 2012 | N | Y | Y | Y | Y | Moderate |
| Chee 2016 | N | Y | Y | Y | Y | Moderate |
| Chen 2002 | N | Y | Y | Y | Y | Moderate |
| Chen 2016 | Y | Y | Y | Y | Y | Good |
| Chen 2018 | N | Y | Y | Y | Y | Moderate |
| Cho 2000 | Y | Y | Y | Y | Y | Good |
| Cho 2001 | N | Y | Y | Y | Y | Moderate |
| Cho 2004 | N | Y | Y | Y | Y | Moderate |
| Cohen 2016 | N | Y | Y | Y | Y | Moderate |
| Cohen 2019 | Y | Y | Y | Y | Y | Good |
| Doeden 2008 | Y | Y | Y | Y | Y | Good |
| El-Mallawany 2011 | N | Y | Y | Y | Y | Moderate |
| Feng 2008 | Y | Y | Y | Y | Y | Good |
| Folkes 2018 | N | Y | Y | Y | Y | Moderate |
| Franzblau 2018 | N | Y | Y | Y | Y | Moderate |
| Guo 2019 | Y | Y | Y | Y | Y | Good |
| Haddad 2014 | N | Y | Y | Y | Y | Moderate |
| Hann 1991 | Y | Y | Y | Y | Y | Good |
| Heo 2003 | N | Y | Y | Y | Y | Moderate |
| Hijazi 2015 | N | Y | Y | Y | Y | Moderate |
| Hirai 2012 | Y | Y | Y | Y | Y | Good |
| Huang 2014 | Y | Y | Y | Y | Y | Good |
| Huh 2009 | N | Y | Y | Y | Y | Moderate |
| Iwatsuki 1999 | Y | Y | Y | Y | Y | Good |
| Iwatsuki 2006 | Y | Y | Y | Y | Y | Good |
| Jung 2015 | N | Y | Y | Y | Y | Moderate |
| Katagiri 2003 | N | Y | Y | Y | Y | Moderate |
| Kawabe 2012 | Y | Y | Y | Y | Y | Good |
| Kim 1998 | N | Y | Y | Y | Y | Moderate |
| Kim 2015 | N | Y | Y | Y | Y | Moderate |
| Kim 2017 | N | Y | Y | Y | Y | Moderate |
| Lee 2012 | N | Y | Y | Y | Y | Moderate |
| Lee 2016 | N | Y | Y | Y | Y | Moderate |
| Levoska 2018 | N | Y | Y | Y | Y | Moderate |
| Li 2013 | Y | Y | Y | Y | Y | Good |
| Li 2018 | N | Y | Y | Y | Y | Moderate |
| Lim 2017 | N | Y | Y | Y | Y | Moderate |
| Lin 2010 | N | Y | Y | Y | Y | Moderate |
| Liu 2020 | N | Y | Y | Y | Y | Moderate |
| Long 2018 | N | Y | Y | Y | Y | Moderate |
| Lyapichev 2020 | Y | Y | Y | Y | Y | Good |
| Lysell 2009 | N | Y | Y | Y | Y | Moderate |
| Magana 1998 | N | Y | Y | Y | Y | Moderate |
| Magana 2016 | Y | Y | Y | Y | Y | Good |
| Merino 2018 | N | Y | Y | Y | Y | Moderate |
| Miranda 2018 | N | Y | Y | Y | Y | Moderate |
| Montalvo 2016 | Y | Y | Y | Y | Y | Good |
| Mose 2014 | N | Y | Y | Y | Y | Moderate |
| Nitta 2005 | Y | Y | Y | Y | Y | Good |
| Nomura 2014 | N | Y | Y | Y | Y | Moderate |
| Nomura 2015 | N | Y | Y | Y | Y | Moderate |
| Oono 1986 | N | Y | Y | Y | Y | Moderate |
| Park 2010 | Y | Y | Y | Y | Y | Good |
| Park 2013 | N | Y | N | Y | Y | Poor |
| Plaza 2015 | Y | Y | Y | Y | Y | Good |
| Qiao 2016 | N | Y | Y | Y | Y | Moderate |
| Quintanilla-Martinez 2013 | Y | Y | Y | Y | Y | Good |
| Rhodes 1998 | Y | Y | N | Y | Y | Moderate |
| Rodriguez-Pinilla 2010 | Y | Y | Y | Y | Y | Good |
| Rodriguez-Pinilla 2011 | Y | Y | Y | Y | Y | Good |
| Roy 2019 | N | Y | Y | N | Y | Poor |
| Ruan 2020 | Y | Y | Y | N | Y | Moderate |
| Ruiz-Maldonado 1995 | Y | Y | N | N | Y | Poor |
| Sangueza 2013 | Y | Y | Y | Y | Y | Good |
| Sangwan 2017 | N | Y | Y | Y | Y | Moderate |
| Santos 2013 | N | Y | Y | Y | Y | Moderate |
| Satoh 2002 | N | Y | Y | Y | Y | Moderate |
| Shi 2014 | N | Y | Y | Y | Y | Moderate |
| Shin 2016 | N | Y | Y | Y | Y | Moderate |
| Steger 1988 | N | Y | Y | Y | Y | Moderate |
| Stratigos 2003 | Y | Y | Y | N | Y | Moderate |
| Takeuchi 2011 | N | Y | Y | Y | Y | Moderate |
| Tanaka 2012 | N | Y | Y | Y | Y | Moderate |
| Toksoy 2017 | N | Y | Y | Y | Y | Moderate |
| Verneuil 2010 | Y | Y | Y | Y | Y | Good |
| Wada 2012 | N | Y | Y | Y | Y | Moderate |
| Wada 2018 | N | Y | Y | Y | Y | Moderate |
| Wang 2013 | N | Y | Y | Y | Y | Moderate |
| Wang 2013 | N | Y | Y | Y | Y | Moderate |
| Wang 2014 | Y | Y | Y | Y | Y | Good |
| Wang 2018 | Y | Y | Y | Y | Y | Good |
| Wang 2019 | Y | Y | Y | Y | Y | Good |
| Wen 2018 | N | Y | Y | Y | Y | Moderate |
| Wen 2019 | Y | Y | Y | Y | Y | Good |
| Wong 2001 | Y | Y | Y | Y | Y | Good |
| Wu 2007 | N | Y | Y | Y | Y | Moderate |
| Xu 2010 | Y | Y | Y | Y | Y | Good |
| Xue 2019 | Y | Y | Y | Y | Y | Good |
| Yang 2014 | Y | Y | Y | Y | Y | Good |
| Yoon 2001 | N | Y | Y | Y | Y | Moderate |
| Yoon 2005 | N | Y | Y | Y | Y | Moderate |
| Zamecki 2010 | N | Y | Y | Y | Y | Moderate |
| Zeng 2012 | N | Y | Y | Y | Y | Moderate |
| Zhang 2013 | N | Y | Y | Y | Y | Moderate |
| Zhang 2018 | Y | Y | Y | Y | Y | Good |

**Supplementary Table 1. Characteristics of the patients of the Asan Medical Center**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Patient** | **Sex/ Age** | **Onset****(years ago)** | **Disease classification and Clinical features** | **Immunohistochemistry/EBV** | **Prognosis** | **Treatment** |
| 1 | F/9 | 3 | Classic HV/papules with crust on the whole body, pruritus, photosensitivity | - | Recurrent eruption after 6 years | Anti-histamine |
| 2 | F/71 | 5 | HVLL/papules with crust on the head and neck, pruritus and pain, facial edema, lymphadenopathy | CD3+, CD4-, CD8-, CD56-, CD20-, CD2+, CD5-, TIA+, Ki-67: 90%, TCR rearrangement +, EBV: 271.2 copies/mL | Progression after 1 year, death after 3 years | Prednisolone, hydroxychloroquine, anti-histamine, topical pimecrolimus |
| 3 | F/40 | 20 | HVLL/papules with crust on the head and neck, photosensitivity | CD3+, CD4+, CD8+, CD20-, Ki-67: 30%, TCR rearrangement +, EBV: 871.8 copies/mL | Progression after 5 years | Minocycline, ibuprofen |
| 4 | F/32 | 0.25 | Severe HV/papules with crust and erosion on the head and neck, pruritus and pain, facial edema, fever, mosquito hypersensitivity | CD3+, CD4-, CD8-, CD56+, CD20-, TIA+, Ki-67: 20%, EBV: 1,069 copies/mL | Death after 3 years | Tetracycline, ibuprofen |
| 5 | F/66 | 20 | HVLL/papules with crust and ulcer on the head, neck, and upper extremities, pruritus and pain, facial edema, fever, weight loss, night sweats, photosensitivity | CD3+, CD4+, CD8+, TCR rearrangement +, EBV: 206,939 copies/mL | Death after 3 years | Hydroxychloroquine, anti-histamine |

HV, Hydroa vacciniforme; HVLL, HV-like T cell lymphoma; EBV, Epstein‒Barr virus; TIA, T-cell intracytoplasmic antigen; TCR, T-cell receptor

**Supplementary Table 2. Treatment data available for 264 HVLPD patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatment** | **Classic HV (%)** | **Severe HV/HVLL (%)** | **Total (%)** |
| Data available, *n* | 23 (100) | 241 (100) | 264 (100) |
| Sun protection, Anti-histamine, NSAID | 12 (52.2) | 12 (5.0) | 24 (9.1) |
| Topical steroid | 6 (26.1) | 6 (2.5) | 12 (4.5) |
| Chemotherapy | 0 | 92 (38.2) | 92 (34.8) |
| Systemic steroid | 2 (8.7) | 105 (43.6) | 107 (40.5) |
| Anti-malarial agents | 3 (13.0) | 14 (5.8) | 17 (6.4) |
| Interferon | 0 | 35 (14.5) | 35 (13.3) |
| Thalidomide | 0 | 28 (11.6) | 28 (10.6) |
| Cyclophosphamide | 0 | 43 (17.8) | 43 (16.3) |
| Antibiotics | 0 | 18 (7.5) | 18 (6.8) |
| Anti-herpetic agents | 2 (8.7) | 21 (8.7) | 23 (8.7) |
| Bone marrow transplant | 0 | 15 (6.2) | 15 (5.7) |
| Intravenous immunoglobulin | 0 | 11 (4.6) | 11 (4.2) |
| Acitretin/Retinoic acid | 0 | 14 (5.8) | 14 (5.3) |
| Chinese herbal medicine | 0 | 11 (4.6) | 11 (4.2) |
| Complete response + Partial response | 8 (88.9) | 95 (60.9) | 103 (62.4) |
| Stable disease + Progressive disease | 1 (11.1) | 61 (39.1) | 62 (37.6) |

HV, Hydroa vacciniforme; HVLL, HV-like T cell lymphoma; NSAID, non-steroidal anti-inflammatory drugs

**Supplementary Table 3.** **Treatment and response data available for classic HV patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatment** | **Classic HV (%)** | **CR + PR** | **SD + PD** |
| Data available, *n* | 9 (100) | 8 (88.9) | 1 (11.1) |
| Sun protection, Anti-histamine, NSAID | 6 (100) | 5 (83.3) | 1 (16.7) |
| Topical steroid | 2 (100) | 2 (100) | 0 |
| Chemotherapy | 0 | 0 | 0 |
| Systemic steroid | 0 | 0 | 0 |
| Anti-malarial agents | 1 (100) | 1 (100) | 0 |
| Interferon | 0 | 0 | 0 |
| Thalidomide | 0 | 0 | 0 |
| Cyclophosphamide | 0 | 0 | 0 |
| Antibiotics | 0 | 0 | 0 |
| Anti-herpetic agents | 0 | 0 | 0 |
| Bone marrow transplant | 0 | 0 | 0 |
| Intravenous immunoglobulin | 0 | 0 | 0 |
| Acitretin/Retinoic acid | 0 | 0 | 0 |
| Chinese herbal medicine | 0 | 0 | 0 |

HV, Hydroa vacciniforme; NSAID, non-steroidal anti-inflammatory drugs; CR, complete response; PR, partial response; SD, stable disease; PD, progressive disease

**Supplementary Table 4.** **Treatment and response data available for severe HV/HVLL patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatment** | **Severe HV/****HVLL (%)** | **CR + PR** | **SD + PD** |
| Data available, *n* | 47 (100) | 36 (76.6) | 11 (23.4) |
| Sun protection, Anti-histamine, NSAID | 0 | 0 | 0 |
| Topical steroid | 1 (100) | 1 (100) | 0 |
| Chemotherapy | 19 (100) | 10 (52.6) | 9 (47.4) |
| Systemic steroid | 6 (100) | 5 (83.3) | 1 (16.7) |
| Anti-malarial agents | 2 (100) | 2 (100) | 0 |
| Interferon | 4 (100) | 4 (100) | 0 |
| Thalidomide | 2 (100) | 2 (100) | 0 |
| Cyclophosphamide | 0 | 0 | 0 |
| Antibiotics | 0 | 0 | 0 |
| Anti-herpetic agents | 5 (100) | 5 (100) | 0 |
| Hematopoietic stem cell transplantation | 4 (100) | 4 (100) | 0 |
| Intravenous immunoglobulin | 2 (100) | 2 (100) | 0 |
| Acitretin/Retinoic acid | 0 | 0 | 0 |
| Chinese herbal medicine | 2 (100) | 1 (50) | 1 (50) |

HV, Hydroa vacciniforme; HVLL, HV-like T cell lymphoma; NSAID, non-steroidal anti-inflammatory drugs CR, complete response; PR, partial response; SD, stable disease; PD, progressive disease

**Supplementary Table 5. Risk factors for the progression and development of secondary lymphoma and parameters affecting overall survival**

|  |
| --- |
| **Risk factors for progression**  |
|  | Univariable analysis |
|  | HR (95% CI) | *P* value |
| Severe HV/HVLL | 1.59 (1.23‒2.05) | < 0.001\*\* |
| Facial edemaOnset age > 9 yearsCD8-positivity in tumor tissuesDual CD4/CD8-negativity in tumor tissuesNon-Whites†  | 6.36 (1.75–23.10)4.35 (1.56‒12.08)0.14 (0.03‒0.76)0.67 (0.50‒0.89)10.64 (2.76‒41.02) | 0.003\*\*0.003\*\*0.014\*0.023\*< 0.001\*\* |
|  | Multivariable analysis |
|  | HR (95% CI) | *P* value |
| Facial edema | 6.36 (1.75‒23.10) | 0.005\*\* |
| **Risk factors for secondary lymphoma** |
|  | Univariable analysis |
|  | HR (95% CI) | *P* value |
| Severe HV/HVLL  | 7.89 (1.06–58.61) | 0.017\* |
| **Risk factors affecting overall survival** |
|  | Univariable analysis |
|  | HR (95% CI) | *P* value |
| Severe HV/HVLL Facial edemaHypersensitivity to mosquito biteCD8-positivity in tumor tissuesDual CD4/CD8-negativity in tumor tissuesNon-White | 1.14 (1.09‒1.21)5.73 (3.01‒10.93)0.40 (0.17‒0.95)0.40 (0.22‒0.76)6.21 (2.66‒14.48)14.13 (1.87‒106.26) | < 0.001\*\*< 0.001\*\*0.036\*0.004\*\*< 0.001\*\*0.001\*\* |
|  | Multivariable analysis |
|  | HR (95% CI) | *P* value |
| Facial edema | 5.31 (2.00‒14.12) | 0.001\*\* |
| Dual CD4/CD8-negativity in tumor tissues | 7.43 (2.21‒24.97) | 0.001\*\* |

\*Statistically significant, †Asian and Latin American

HV, Hydroa vacciniforme; HVLL, HV-like T cell lymphoma; CI, confidence interval; HR, hazard ratio

**eReferences**

1. Barrionuevo C, Anderson VM, Zevallos-Giampietri E, Zaharia M, Misad O, Bravo F, et al. Hydroa-like cutaneous T-cell lymphoma: a clinicopathologic and molecular genetic study of 16 pediatric cases from Peru. Appl Immunohistochem Mol Morphol. 2002 Mar;10(1):7-14.

2. Beltran BE, Maza I, Moises-Alfaro CB, Vasquez L, Quinones P, Morales D, et al. Thalidomide for the treatment of hydroa vacciniforme-like lymphoma: report of four pediatric cases from Peru. Am J Hematol. 2014 Dec;89(12):1160-1.

3. Boddu D, George R, Nair S, Bindra M, L GM. Hydroa vacciniforme-like lymphoma: a case report from India. J Pediatr Hematol Oncol. 2015 May;37(4):e223-6.

4. Brauns B, Seitz CS, Schon MP, Mempel M. Sunlight-induced papulovesicular eruption in an 8-year-old girl. J Dtsch Dermatol Ges. 2012 Dec;10(12):923-4.

5. Chee JN, Koh MJ, Liew HM. Progressive scarring facial lesions in a boy. Clin Case Rep. 2016 Feb;4(2):120-2.

6. Chen CC, Chang KC, Medeiros LJ, Lee JY. Hydroa vacciniforme and hydroa vacciniforme-like T-cell lymphoma: an uncommon event for transformation. J Cutan Pathol. 2016 Dec;43(12):1102-11.

7. Chen HH, Hsiao CH, Chiu HC. Hydroa vacciniforme-like primary cutaneous CD8-positive T-cell lymphoma. Br J Dermatol. 2002 Sep;147(3):587-91.

8. Chen WT, Lin CY, Chang YC. Hydroa vacciniforme-like lymphoma with CD56 expression: an unusual immunophenotype [abstract 7125]. J Am Acad Dermatol. 2018 Sep;79(3 S1):AB154.

9. Cho KH, Choi WW, Youn CS, Kim CW, Heo DS. Skin is the frequent site for involvement of peripheral T-cell and natural killer cell lymphomas in Korea. J Dermatol. 2000 Aug;27(8):500-7.

10. Cho KH, Kim CW, Heo DS, Lee DS, Choi WW, Rim JH, et al. Epstein-Barr virus-associated peripheral T-cell lymphoma in adults with hydroa vacciniforme-like lesions. Clin Exp Dermatol. 2001 May;26(3):242-7.

11. Cho KH, Lee SH, Kim CW, Jeon YK, Kwon IH, Cho YJ, et al. Epstein-Barr virus-associated lymphoproliferative lesions presenting as a hydroa vacciniforme-like eruption: an analysis of six cases. Br J Dermatol. 2004 Aug;151(2):372-80.

12. Cohen JI, Dropulic L, Hsu AP, Zerbe CS, Krogmann T, Dowdell K, et al. Association of GATA2 deficiency with severe primary Epstein-Barr virus (EBV) infection and EBV-associated cancers. Clin Infect Dis. 2016 Jul 1;63(1):41-7.

13. Cohen JI, Manoli I, Dowdell K, Krogmann TA, Tamura D, Radecki P, et al. Hydroa vacciniforme-like lymphoproliferative disorder: an EBV disease with a low risk of systemic illness in whites. Blood. 2019 Jun 27;133(26):2753-64.

14. Doeden K, Molina-Kirsch H, Perez E, Warnke R, Sundram U. Hydroa-like lymphoma with CD56 expression. J Cutan Pathol. 2008 May;35(5):488-94.

15. El-Mallawany NK, Geller L, Bollard CM, Wistinghausen B, Mussai F, Wayne AS, et al. Long-term remission in a child with refractory EBV(+) hydroa vacciniforme-like T-cell lymphoma through sequential matched EBV(+)-related allogeneic hematopoietic SCT followed by donor-derived EBV-specific cytotoxic T-lymphocyte immunotherapy. Bone Marrow Transplant. 2011 May;46(5):759-61.

16. Feng S, Jin P, Zeng X. Hydroa vacciniforme-like primary cutaneous CD8-positive T-cell lymphoma. Eur J Dermatol. 2008 May-Jun;18(3):364-5.

17. Folkes AS, Querfeld C, Zain JM, Rosen ST. Hydroa vacciniforme-like lymphoproliferative disease mimicking acneiform lesions in a patient with chronic active Epstein-Barr virus infection [abstract 6375]. J Am Acad Dermatol. 2018 Sep;79(3 S1):AB154.

18. Franzblau L, Yu K, Fullen D, Carty S, Tejasvi T. Hydroa vacciniforme-like lymphoma in an adult resident of the Unite States [abstract 7326]. J Am Acad Dermatol. 2018;79(3 S1):AB135.

19. Guo N, Chen Y, Wang Y, Huang Y, Feng Y, Li M, et al. Clinicopathological categorization of hydroa vacciniforme-like lymphoproliferative disorder: an analysis of prognostic implications and treatment based on 19 cases. Diagn Pathol. 2019 Jul 17;14(1):82.

20. Haddad JM, Monroe HR, Hardin J, Diwan AH, Hsu S. Hydroa vacciniforme: a rare photodermatosis. Dermatol Online J. 2014 Aug 17;20(8).

21. Hann SK, Im S, Park YK, Lee S. Hydroa vacciniforme with unusually severe scar formation: diagnosis by repetitive UVA phototesting. J Am Acad Dermatol. 1991 Aug;25(2 Pt 2):401-3.

22. Heo EP, Park SH, Kim TH. Artificial reproduction of atypical hydRoa vacciniforme caused by latent EpStein-Barr virus infection. Int J Dermatol. 2003 Jun;42(6):476-9.

23. Hijazi M, Malek J, Nabulsi M, Ghosn S. Atypical hydroa vacciniforme mimicking dermatomyositis: a case report in a Lebanese girl. JAAD Case Rep. 2015 Mar;1(2):63-5.

24. Hirai Y, Yamamoto T, Kimura H, Ito Y, Tsuji K, Miyake T, et al. Hydroa vacciniforme is associated with increased numbers of Epstein-Barr virus-infected gammadeltaT cells. J Invest Dermatol. 2012 May;132(5):1401-8.

25. Huang W, Lv N, Ying J, Qiu T, Feng X. Clinicopathological characteristics of four cases of EBV positive T-cell lymphoproliferative disorders of childhood in China. Int J Clin Exp Pathol. 2014;7(8):4991-9.

26. Huh SY, Choi M, Cho KH. A case of Epstein-Barr virus-associated hydroa vacciniforme. Ann Dermatol. 2009 May;21(2):209-12.

27. Iwatsuki K, Satoh M, Yamamoto T, Oono T, Morizane S, Ohtsuka M, et al. Pathogenic link between hydroa vacciniforme and Epstein-Barr virus-associated hematologic disorders. Arch Dermatol. 2006 May;142(5):587-95.

28. Iwatsuki K, Xu Z, Takata M, Iguchi M, Ohtsuka M, Akiba H, et al. The association of latent Epstein-Barr virus infection with hydroa vacciniforme. Br J Dermatol. 1999 Apr;140(4):715-21.

29. Jung SE, Cho KH, Lee MW, Kim YC. Hydroa vacciniforme-like eruption associated with Epstein-Barr virus infection in an older adult. Ann Dermatol. 2015 Dec;27(6):789-91.

30. Katagiri Y, Mitsuhashi Y, Kondo S, Kanazawa C, Iwatsuki K, Tsunoda T. Hydroa vacciniforme-like eruptions in a patient with chronic active EB virus infection. J Dermatol. 2003 May;30(5):400-4.

31. Kawabe S, Ito Y, Gotoh K, Kojima S, Matsumoto K, Kinoshita T, et al. Application of flow cytometric in situ hybridization assay to Epstein-Barr virus-associated T/natural killer cell lymphoproliferative diseases. Cancer Sci. 2012 Aug;103(8):1481-8.

32. Kim TH, Lee JH, Kim YC, Lee SE. Hydroa vacciniforme-like lymphoma misdiagnosed as cutaneous lupus erythematosus. J Cutan Pathol. 2015 Mar;42(3):229-31.

33. Kim WS, Yeo UC, Chun HS, Lee ES. A case of hydroa vacciniforme with unusual ear mutilation. Clin Exp Dermatol. 1998 Mar;23(2):70-2.

34. Kim YJ, Choi SY, Lee WJ, Won CH, Chang SE, Choi JH, et al. Two cases of hydroa vacciniforme-like lymphoproliferative disease controlled by anti-inflammatory agents. Photodermatol Photoimmunol Photomed. 2017 Sep;33(5):287-90.

35. Lee HY, Baek JO, Lee JR, Park SH, Jeon IS, Roh JY. Atypical hydroa vacciniforme-like epstein-barr virus associated T/NK-cell lymphoproliferative disorder. Am J Dermatopathol. 2012 Dec;34(8):e119-24.

36. Lee TH, Ko YH. Chronic active EBV infection: the experience of the Samsung medical center in South Korea. Bol Med Hosp Infant Mex. 2016 Jan - Feb;73(1):10-17.

37. Levoska MA, Cohen JI, Manoli I, Richard Lee CC, Ching SST, Shand J, et al. Recurrent scarring papulovesicular lesions on sun-exposed skin in a 22-year-old man. J Am Acad Dermatol. 2018 Mar;78(3):637-42.

38. Li J, Zan Y, Liu H, Liu H, Chen L. Hydroa vacciniforme-like cutaneous T-cell lymphoma in a child: a case report. Medicine (Baltimore). 2018 Apr;97(15):e0319.

39. Li Y, Chen XH, Tian XY, Li B, Li Z. Primary cutaneous hydroa vacciniforme-like lymphoma with indolent clinical course: report of two cases and review of literature. Int J Surg Pathol. 2013 Apr;21(2):161-8.

40. Lim JS, Kim TM, Cho KH. Epstein-Barr virus-associated vesiculopapular eruption on the face of a patient with natural Killer T cell lymphoma. Ann Dermatol. 2017 Oct;29(5):618-20.

41. Lin HC, Chao SC, Chang KC, Lee JYY. Hydroa vacciniforme-like lymphoma: a case report and literature review. Dermatol Sin. 2010 Dec;28(4):167-72.

42. Liu Y, Liu ZQ, Gu CY, Chen LJ, Xiang LH. Necrotic papulovesicular lesions mainly on sun-exposed areas. Clin Exp Dermatol. 2020 Jun;45(4):485-89.

43. Long V, Liang MW, Tan SH. Hydroa vacciniforme-like lymphoproliferative disorder in an elderly Chinese patient and a literature review of adult cases. Int J Dermatol. 2018 Nov;57(11):1283-92.

44. Lyapichev KA, Sukswai N, Wang XI, Khoury JD, Medeiros LJ. Hydroa vacciniforme-like lymphoproliferative disorder with progression to EBV+ cytotoxic peripheral T-cell lymphoma. Am J Dermatopathol. 2020 Sep;42(9):714-16.

45. Lysell J, Wiegleb Edström D, Linde A, Carlsson G, Malmros-Svennilson J, Westermark A, et al. Antiviral therapy in children with hydroa vacciniforme. Acta Derm Venereol. 2009;89(4):393-7.

46. Magana M, Massone C, Magana P, Cerroni L. Clinicopathologic features of hydroa vacciniforme-like lymphoma: a series of 9 patients. Am J Dermatopathol. 2016 Jan;38(1):20-5.

47. Magana M, Sangueza P, Gil-Beristain J, Sanchez-Sosa S, Salgado A, Ramon G, et al. Angiocentric cutaneous T-cell lymphoma of childhood (hydroa-like lymphoma): a distinctive type of cutaneous T-cell lymphoma. J Am Acad Dermatol. 1998 Apr;38(4):574-9.

48. Merino U, Moises C, Sanchez G, Carbajal T. Hydroa vacciniforme-like cutaneous T/natural killer cell lymphoma: case report [abstract 6554]. J Am Acad Dermatol. 2018 Sep;79(3 S1):AB153.

49. Miranda MFR, Santos J, Muller SFR, Bittencourt MJS, Brito AC, Barros Junior J, et al. Hydroa vacciniforme-like T-cell lymphoma: a further Brazilian case. Am J Dermatopathol. 2018 Mar;40(3):201-04.

50. Montalvo N, Redroban L. Hydroa vacciniforme-like EBV-positive cutaneous T-Cell lymphoma, first report of 2 cases in ecuador. Am J Dermatopathol. 2016 May;38(5):e57-9.

51. Mose AP, Fisker N, Clemmensen O, Bygum A. Antiviral treatment of a boy with EBV-associated hydroa vacciniforme. BMJ Case Rep. 2014 Nov 24;2014.

52. Nitta Y, Iwatsuki K, Kimura H, Kojima S, Morishima T, Tsuji K, et al. Fatal natural killer cell lymphoma arising in a patient with a crop of Epstein-Barr virus-associated disorders. Eur J Dermatol. 2005 Nov-Dec;15(6):503-6.

53. Nomura H, Egami S, Kasai H, Mori M, Yokoyama T, Fujimoto A, et al. An elderly patient with chronic active Epstein-Barr virus infection with severe hydroa vacciniforme-like eruptions associated with alphabetaT-cell proliferation. J Dermatol. 2014 Apr;41(4):360-2.

54. Nomura H, Suzuki H, Egami S, Yokoyama T, Sugiura M, Tomita K, et al. A patient with elderly-onset atypical hydroa vacciniforme with an indolent clinical course. Br J Dermatol. 2015 Sep;173(3):801-5.

55. Oono T, Arata J, Masuda T, Ohtsuki Y. Coexistence of hydroa vacciniforme and malignant lymphoma. Arch Dermatol. 1986 Nov;122(11):1306-9.

56. Park BM, Ahn JS, Lee JB, Won YH, Yun SJ. Chronic active Epstein-Barr virus infection-associated hydroa vacciniforme-like eruption and Behcet's-like orogenital ulcers. Dermatology. 2013;226(3):212-6.

57. Park S, Lee DY, Kim WS, Ko YH. Primary cutaneous Epstein-Barr virus-associated T-cell lymphoproliferative disorder-2 cases with unusual, prolonged clinical course. Am J Dermatopathol. 2010 Dec;32(8):832-6.

58. Plaza JA, Sangueza M. Hydroa vacciniforme-like lymphoma with primarily periorbital swelling: 7 cases of an atypical clinical manifestation of this rare cutaneous T-cell lymphoma. Am J Dermatopath. 2015 Jan;37(1):20-25.

59. Qiao J, Fang H. Hydroa vacciniforme-like lymphoma. QJM. 2016 Oct;109(10):697-98.

60. Quintanilla-Martinez L, Ridaura C, Nagl F, Saez-de-Ocariz M, Duran-McKinster C, Ruiz-Maldonado R, et al. Hydroa vacciniforme-like lymphoma: a chronic EBV+ lymphoproliferative disorder with risk to develop a systemic lymphoma. Blood. 2013 Oct 31;122(18):3101-10.

61. Rhodes LE, White SI. Dietary fish oil as a photoprotective agent in hydroa vacciniforme. Brit J Dermatol. 1998 Jan;138(1):173-78.

62. Rodriguez-Pinilla SM, Barrionuevo C, Garcia J, de los Angeles M, Pajares R, Casavilca S, et al. Epstein-Barr virus-positive systemic NK/T-cell lymphomas in children: report of six cases. Histopathology. 2011 Dec;59(6):1183-93.

63. Rodriguez-Pinilla SM, Barrionuevo C, Garcia J, Martinez MT, Pajares R, Montes-Moreno S, et al. EBV-associated cutaneous NK/T-cell lymphoma: review of a series of 14 cases from peru in children and young adults. Am J Surg Pathol. 2010 Dec;34(12):1773-82.

64. Roy SF, Ghazawi FM, Powell J, Kokta V, Belisle A. EBV-associated hydroa vacciniforme-like T-cell lymphoma. Br J Haematol. 2019 Sep;186(6):802.

65. Ruan Y, Shen X, Shi R, Zhao X, Zheng J. Hydroa Vacciniforme-like lymphoproliferative disorder treated with intravenous immunoglobulin: long-term remission without haematopoietic stem cell transplantation or chemotherapy. Acta Derm Venereol. 2020 Jun 18;100(13):adv00192.

66. Ruiz-Maldonado R, Parrilla FM, Orozco-Covarrubias ML, Ridaura C, Tamayo Sanchez L, Duran McKinster C. Edematous, scarring vasculitic panniculitis: a new multisystemic disease with malignant potential. J Am Acad Dermatol. 1995 Jan;32(1):37-44.

67. Sangueza M, Plaza JA. Hydroa vacciniforme-like cutaneous T-cell lymphoma: clinicopathologic and immunohistochemical study of 12 cases. J Am Acad Dermatol. 2013 Jul;69(1):112-9.

68. Sangwan A, Aggarwal K, Kaur S, Jain VK. Adult-onset hydroa vacciniforme: a rare occurrence or a lymphoma premonition? Indian Dermatol Online J. 2017 Nov-Dec;8(6):490-91.

69. Santos M, Nogueira L, Talahri C, Massone C, Cerroni L, Mira MT, et al. Hydroa vacciniforme-like lymphoma in a patient from the Brazilian Amazon. Int J Dermatol. 2013 May;52(5):641-3.

70. Satoh M, Oyama N, Akiba H, Ohtsuka M, Iwatsuki K, Kaneko F. Hypersensitivity to mosquito bites with natural-killer cell lymphocytosis: the possible implication of Epstein-Barr virus reactivation. Eur J Dermatol. 2002 Jul-Aug;12(4):381-4.

71. Shi JQ, Chen QX, Li SF, Li W. Hydroa vacciniforme-like cutaneous T-cell lymphoma. Indian J Dermatol. 2014 Jan;59(1):91-3.

72. Shin SY, Park CH, Cho D, Kim HJ, Kim SH. Marked increase of circulating double-negative gammadelta T cells in a patient with hydroa vacciniforme-like lymphoma. Ann Lab Med. 2016 May;36(3):268-70.

73. Steger GG, Dittrich C, Hönigsmann H, Moser K. Permanent cure of hydroa vacciniforme after chemotherapy for Hodgkin's disease. Br J Dermatol. 1988 Nov;119(5):684-5.

74. Stratigos AJ, Antoniou C, Papathanakou E, Daboudi M, Tranaka K, Tsara K, et al. Spectrum of idiopathic photodermatoses in a Mediterranean country. Int J Dermatol. 2003 Jun;42(6):449-54.

75. Takeuchi T, Kamide R. Severe hydroa vacciniforme-like eruptions confined to sun-exposed areas. J Dermatol. 2011 Apr;38(4):386-9.

76. Tanaka C, Hasegawa M, Fujimoto M, Iwatsuki K, Yamamoto T, Yamada K, et al. Phenotypic analysis in a case of hydroa vacciniforme-like eruptions associated with chronic active Epstein-Barr virus disease of gammadelta T cells. Br J Dermatol. 2012 Jan;166(1):216-8.

77. Toksoy A, Strifler S, Benoit S, Grigoleit GU, Knop S, Mielke S, et al. Hydroa vacciniforme-like skin lesions in Epstein-Barr-virus-associated T-cell lymphoproliferation with subsequent development of aggressive NK/T-cell lymphoma. Acta Derm Venereol. 2017 Mar 10;97(3):379-80.

78. Verneuil L, Gouarin S, Comoz F, Agbalika F, Creveuil C, Varna M, et al. Epstein-Barr virus involvement in the pathogenesis of hydroa vacciniforme: an assessment of seven adult patients with long-term follow-up. Br J Dermatol. 2010 Jul;163(1):174-82.

79. Wada T, Toga A, Sakakibara Y, Toma T, Hasegawa M, Takehara K, et al. Clonal expansion of Epstein-Barr virus (EBV)-infected gammadelta T cells in patients with chronic active EBV disease and hydroa vacciniforme-like eruptions. Int J Hematol. 2012 Oct;96(4):443-9.

80. Wada T, Toma T, Miyazawa H, Koizumi E, Shirahashi T, Matsuda Y, et al. Characterization of skin blister fluids from children with Epstein-Barr virus-associated lymphoproliferative disease. J Dermatol. 2018 Apr;45(4):444-49.

81. Wang GN, Cui Y, Zhao WG, Li L, Zhang XD, Chang Y, et al. Clinicopathological analysis of the hydroa vacciniforme-like lymphoproliferative disorder with natural killer cell phenotype compared with cutaneous natural killer T-cell lymphoma. Exp Ther Med. 2018 Dec;16(6):4772-78.

82. Wang L, Su Y, Zhang J, Wen H, Zhang G. Hydroa vacciniforme-like lymphoma with systemic symptoms: two case reports. Indian J Dermatol. 2019 Nov-Dec;64(6):493-96.

83. Wang M, Wang S, Yang QP, Liu YM, Gao LM, Sun H, et al. Hydroa vacciniforme-like lymphoma of an adult: a case report with review of the literature. Diagn Pathol. 2013 May 1;8:72.

84. Wang RC, Chang ST, Hsieh YC, Huang WT, Hsu JD, Tseng CE, et al. Spectrum of Epstein-Barr virus-associated T-cell lymphoproliferative disorder in adolescents and young adults in Taiwan. Int J Clin Exp Pathol. 2014;7(5):2430-7.

85. Wang T, Wang L, Xiong L, Han M, Liu W, Li G. A rare case of hydroa vacciniforme-like cutaneous T-cell lymphoma presenting mimicking herpes simplex in an adult. Am J Dermatopathol. 2013 Jul;35(5):617-8.

86. Wen PF, Liu H. Hydroa vacciniforme-like cutaneous T-cell lymphoma in an adult presenting with facial edema and recurrent oral ulceration. Am J Dermatopathol. 2018 Mar;40(3):227-29.

87. Wen PF, Zhang M, Wang TT, Liu HJ, Zhang WY, Liu WP, et al. Comparative study of the clinical pathology, immunophenotype, Epstein-Barr virus infection status, and gene rearrangements in adult and child patients with hydroa vacciniforme-like lymphoproliferative disorder. Am J Dermatopathol. 2019 Jan;41(1):7-15.

88. Wong SN, Tan SH, Khoo SW. Late-onset hydroa vacciniforme: two case reports. Br J Dermatol. 2001 Apr;144(4):874-7.

89. Wu YH, Chen HC, Hsiao PF, Tu MI, Lin YC, Wang TY. Hydroa vacciniforme-like Epstein-Barr virus-associated monoclonal T-lymphoproliferative disorder in a child. Int J Dermatol. 2007 Oct;46(10):1081-6.

90. Xu Z, Lian S. Epstein-Barr virus-associated hydroa vacciniforme-like cutaneous lymphoma in seven Chinese children. Pediatr Dermatol. 2010 Sep-Oct;27(5):463-9.

91. Xue R, Elbendary A, Liu H, Chen Y, Cleaver N, Elston DM. Hydroa vacciniforme-like lymphoma: clinicopathological description, treatment and outcome. J Am Acad Dermatol. 2019 Nov 20.

92. Yang YQ, Fan L, Wang L, Xu J, Zhang R, Ge Z, et al. Systemic lymphoma arising from hydroa vacciniforme-like lymphoma: report of two cases with review of literature. Int J Clin Exp Pathol. 2014;7(9):6403-8.

93. Yoon TY, Kim YG, Kim JW, Kim MK. Nodal marginal zone lymphoma in association with hydroa vacciniforme-like papulovesicular eruption, hypersensitivity to mosquito bites and insect bite-like reaction. Br J Dermatol. 2005 Jul;153(1):210-2.

94. Yoon TY, Yang TH, Hahn YS, Huh JR, Soo Y. Epstein-Barr virus-associated recurrent necrotic papulovesicles with repeated bacterial infections ending in sepsis and death: consideration of the relationship between Epstein-Barr virus infection and immune defect. J Dermatol. 2001 Aug;28(8):442-7.

95. Zamecki KJ, Friedman AH, Raab EL. Ophthalmic findings in a patient with CD8-positive T cell lymphoma and a hydroa vacciniforme-like eruption. Br J Ophthalmol. 2010 Sep;94(9):1266-7.

96. Zeng Y, Fu L, Jin H, Sun Q, Wang B. Hydroa vacciniforme-like Epstein-Barr virus-associated lymphoproliferative disease: a case report. Pediatr Dermatol. 2012 Jan-Feb;29(1):96-100.

97. Zhang G, Bai HX, Yang L, Ma MH, Su Y, Luo Y, et al. NK-/T-cell lymphoma resembling hydroa vacciniforme with positive CD4 marker expression: a diagnostic difficulty. Am J Dermatopathol. 2013 Feb;35(1):94-7.

98. Zhang X, Wang T, Wang L. Hydroa vacciniforme-like lymphoma in Tibetan children: 2 cases and a literature review. Am J Dermatopathol. 2018 May;40(5):358-61.