

Images in this Issue

Preventive &
Social Medicine



A Case of Severe Lead Poisoning with Basophilic Stippling Teardrop Cell

Wonyang Kang ,¹ Seunghyeon Cho ,² Dae-Young Lim ,² Suwhan Kim ,² and Won-Ju Park ²

¹Institute of Occupational and Environmental Health, Korea Workers' Compensation & Welfare Service, Incheon, Korea

²Department of Occupational and Environmental Medicine, Chonnam National University Hwasun Hospital, Chonnam National University Medical School, Hwasun, Korea



Received: Aug 18, 2019

Accepted: Oct 29, 2019

Address for Correspondence:

Won-Ju Park, MD, PhD

Department of Occupational and Environmental Medicine, Chonnam National University Hwasun Hospital, Chonnam National University Medical School, 322 Seoyang-ro, Hwasun 58128, Republic of Korea.
E-mail: luvoem@gmail.com

© 2019 The Korean Academy of Medical Sciences.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Wonyang Kang
<https://orcid.org/0000-0003-0915-712X>
Seunghyeon Cho
<https://orcid.org/0000-0001-5314-2078>
Dae-Young Lim
<https://orcid.org/0000-0001-9780-0626>
Suwhan Kim
<https://orcid.org/0000-0003-3796-819X>
Won-Ju Park
<https://orcid.org/0000-0002-1081-9840>

Disclosure

The authors have no potential conflicts of interest to disclose.



Fig. 1. Basophilic stippling teardrop of a red blood cell on peripheral blood smear.

In November 2018, a 50-year-old man has received emergency room and gastrointestinal medical care several times due to severe abdominal pain and 11-kilogram weight loss that occurred 3 months ago. Various tests were performed, but no cause of severe periumbilical abdominal pain was found (abdominal computed tomography, ultrasonography, upper gastrointestinal endoscopy, and colonoscopy). Blood tests showed microcytic hypochromic anemia (hemoglobin, 8.7 g/dL; red blood cell, $3.31 \times 10^6/\text{mm}^3$; hematocrit, 27.9%). And basophilic stippling teardrop of red blood cells was observed in the peripheral blood smear (Fig. 1). After several interviews, the patient revealed that he had been taking traditional herbal medicine for about half a year. He bought the ingredients for the herbal medicine himself at various traditional markets and made and took them himself. The worse the patient got, the harder he took the herbal medicine. Tests were conducted on heavy metals, and the blood lead level was 164 $\mu\text{g}/\text{dL}$ (adult normal limit, 10 $\mu\text{g}/\text{dL}$).^{1,2} The cause of severe periumbilical abdominal pain was lead colic.³ Other heavy metals test results were within normal limits (urine mercury, 2.252 $\mu\text{g}/\text{L}$; blood mercury, 1.495 $\mu\text{g}/\text{L}$; urine cadmium, 1.58 $\mu\text{g}/\text{g}$ creatinine; blood cadmium, 0.95 $\mu\text{g}/\text{L}$; urine nickel, 3.67 $\mu\text{g}/\text{L}$; blood manganese, 4.37 $\mu\text{g}/\text{L}$; urine arsenic, 107.016 $\mu\text{g}/\text{L}$; blood zinc, 75 $\mu\text{g}/\text{dL}$; blood copper, 95 $\mu\text{g}/\text{dL}$). He was hospitalized 16 days and had chelation treatment (dimercaptosuccinic acid 600 mg twice a day for 14 days).^{4,5} After a month, the blood lead level fell to 75.2 $\mu\text{g}/\text{dL}$ and was able to return

Author Contributions

Conceptualization: Park WJ. Investigation:
Lim DY, Kim S. Writing - original draft: Kang W.
Writing - review & editing: Cho S, Park WJ.

to manual work. The patient is receiving periodic cognitive therapy to correct the wrong belief about herbal medicine.⁶

Tear-drop, also known as dacrocyte, is tapered to a point at one end, resembling the classic artist's rendition of a drop of water. Tear-drop is a type of poikilocyte. It is a nonspecific finding seen in several conditions, including myelofibrosis and myelodysplastic syndromes.⁷ Basophilic stippling, also known as punctate basophilia, is fine, medium, coarse blue granules due to abnormal aggregated ribosomes. Basophilic stippling is often observed with increased red blood cell production. These occurred in clinical conditions such as anemia, thalassemia, myelodysplasia, pyrimidine 5'-nucleotidase deficiency, and post-chemotherapy.^{7,8} Basophilic stippling cells are also commonly observed in patients with severe lead poisoning.⁹⁻¹¹ However, it is rare for teardrop variations to be accompanied. According to our knowledge, there are no reports on basophilic stippling teardrop cell, so we have reported this case.

REFERENCES

- Centers for Disease Control and Prevention. Adult blood lead epidemiology & surveillance (ABLES). <http://www.cdc.gov/niosh/topics/ABLES/description.html>. Accessed August 10, 2019.
- Ahn J, Kim NS, Lee BK, Park J, Kim Y. Association of blood pressure with blood lead and cadmium levels in Korean adolescents: analysis of data from the 2010–2016 Korean National Health and Nutrition Examination Survey. *J Korean Med Sci* 2018;33(44):e278.
[PUBMED](#) | [CROSSREF](#)
- Deng K, Hu R, Zhang Y. An unusual cause of recurrent severe abdominal colic. *Gastroenterology* 2016;151(5):819-21.
[PUBMED](#) | [CROSSREF](#)
- Kim HC, Jang TW, Chae HJ, Choi WJ, Ha MN, Ye BJ, et al. Evaluation and management of lead exposure. *Ann Occup Environ Med* 2015;27:30.
[PUBMED](#) | [CROSSREF](#)
- Kang KW, Park WJ. Lead poisoning at an indoor firing range. *J Korean Med Sci* 2017;32(10):1713-6.
[PUBMED](#) | [CROSSREF](#)
- Lim DY, Kang WY, Ahn JS, Cho S, Kim S, Moon JD, et al. Collective exposure to lead from an approved natural product-derived drug in Korea. *Ann Occup Environ Med* 2019;31(1):e20.
[PUBMED](#) | [CROSSREF](#)
- Ford J. Red blood cell morphology. *Int J Lab Hematol* 2013;35(3):351-7.
[PUBMED](#) | [CROSSREF](#)
- Cheson BD, Rom WN, Webber RC. Basophilic stippling of red blood cells: a nonspecific finding of multiple etiology. *Am J Ind Med* 1984;5(4):327-34.
[PUBMED](#) | [CROSSREF](#)
- Zhao Y, Lv J. Basophilic stippling and chronic lead poisoning. *Turk J Haematol* 2018;35(4):298-9.
[PUBMED](#)
- Chan NC, Chan KP. Coarse basophilic stippling in lead poisoning. *Blood* 2017;129(24):3270.
[PUBMED](#) | [CROSSREF](#)
- Munoz J, Guo Y. Basophilic stippling: a lead to the diagnosis. *Blood* 2011;118(20):5370.
[PUBMED](#) | [CROSSREF](#)