International Journal of Health Sciences and Research
Vol.10; Issue: 8; August 2020
Website: www.ijhsr.org
Case Report *ISSN: 2249-9571*

Chronic Benign Neutropenia- A Case Report

Rachana Garg[1], Sushma V Belurkar[2], Niveditha Suvarna[3]

[1]SR Pathology at Jawaharlal Nehru Cancer Hospital and Research Centre,
[2]Associate Professor, Department of Pathology, Kasturbha Medical College, Manipal, Karnataka.
[3]Consultant Pathologist Medcure Diagnostics Mysore

Corresponding Author: Rachana Garg

ABSTRACT

Chronic benign neutropenia also called as Autoimmune neutropenia of infancy occurs in infants and children usually in the first year of life. This is a benign condition and presents mostly as mild infections in children. It is caused due to specific neutrophil antibodies that cause peripheral destruction of neutrophils. Careful evaluation of the condition is mandatory to avoid misdiagnosis of leukemia. On follow up its noted that spontaneous regression usually occurs within 5 years of age. We report a case of chronic benign neutropenia in a 1 year old male child, diagnosed after a series of workup. This case is reported due to its rarity and novelty.

Keywords: autoimmune, neutrophils, childhood, antibodies.

INTRODUCTION

In 1941, Hotz and Fanconi first described the term 'Chronic benign neutropenia in young children. [1] It is defined as absolute neutrophil count (ANC) < 1000 cells/cu mm in infants and < 1500 cells/cu mm in children and adults, persisting for more than 6 months. [2] The absolute neutrophil count (ANC) is equal to the product white blood cell count (WBC) and the fraction of polymorphonuclear cells (PMNs) and band forms noted on the differential analysis. ANC = Total WBC count (cells/µL) x percent (PMNs + bands) x 10

The normal range being 1500-8000cells/cumm. In 1975, Lalezari and others, showed presence of anti-neutrophilic antibodies indicating an autoimmune nature in chronic benign neutropenia [3] Later, it was defined as a chronic condition with depletion of mature neutrophils with compensatory increase in immature granulocytes in the bone marrow. [1] Children usually present with mild infections and are usually diagnosed in the first year of life (range 2-54 months), spontaneous recovery is noted in children within 2-4 years of age [5] and the mean duration of neutropenia is approximately 20 months. Exact etiology is still unknown. We report a case of a 1 year old child diagnosed with chronic benign neutropenia after following series of diagnostic workup.

CASE REPORT

A 1 year old male child presented with complains of upper respiratory tract infection and fever since 5 days. He was admitted to the hospital. There was no specific family history and no relevant history of drug intake. On clinical examination, no abnormalities were noted. Hematological investigations, showed the following- complete blood count findings- Hemoglobin- 11.6gms, Total leukocyte count- 11,300 cells/cumm, platelets- 3,29,000 cells/cumm, MCV- 77.8fl, MCH- 26.7pg, MCHC- 34.3%.Differential count- Neutrophils-2%, Lymphocytes-40%, Monocytes-12%, Eosinophils-44%. Absolute neutrophil count (ANC) was- 226/cumm. Peripheral smear shows predominantly lymphocytes and eosinophils

with markedly decreased neutrophils (Figure 1). USG abdomen findings were within normal limits. As HIV infection can present with neutropenia, viral markers were done and found to be negative. Vitamin B12/folate levels were assessed and found to be within normal range. The child was started on intravenous antibiotics and fever subsided within 3 days.

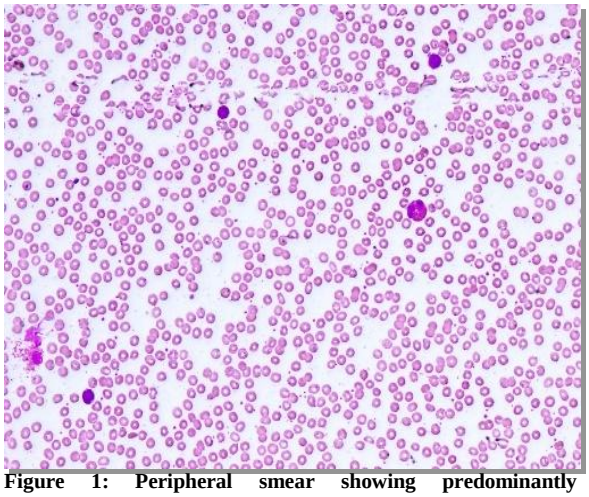

Figure 1: Peripheral smear showing predominantly lymphocytes and eosinophils with markedly decreased neutrophils, Romanowsky10x.

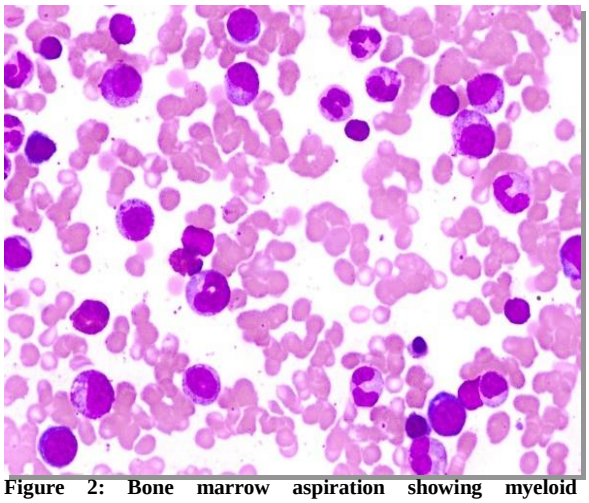

Figure 2: Bone marrow aspiration showing myeloid hyperplasia with increase in precursor forms, Romanowsky 40x.

On the 3rd day, he developed cervical adenopathy and fever recurred. Repeat peripheral smears showed severe neutropenia. Bone marrow aspiration (Figure 2) and biopsy (Figure 3)was done and showed increased M/E ratio ,myeloid hyperplasia with increase in precursor forms, no abnormal cells were seen. Child was further evaluated for immunodeficiency and revealed raised IgG. There was no acquired immunodeficiency. He was continued on intravenous Bactrim for 16 days. Diagnosis of 'Chronic benign neutropenia' was considered as neutropenia persisted for more than 2 weeks.

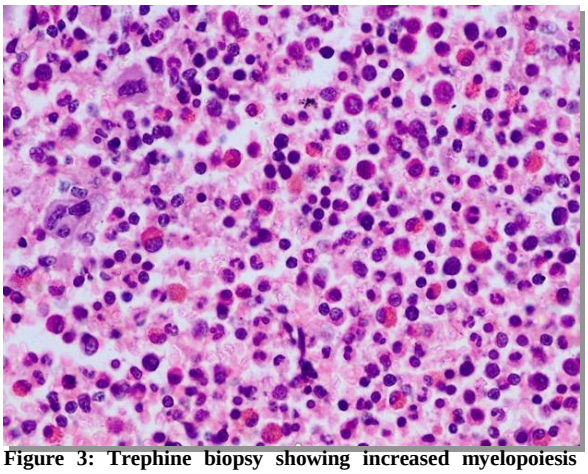

Figure 3: Trephine biopsy showing increased myelopoiesis with increased eosinophils, H&E 40x.

Later the patient was given 3 doses of G-CSF, following which neutrophil counts improved. Counts done 4 days after G-CSF showed ANC-252/cumm. The child was under regular follow up and his ANC ranged from 126-700/cumm during a period of one and a half years.

DISCUSSION

Neutropenia in children and adults is described as ANC less than 1500 cells/cu mm, but it usually becomes evident only when the count is less than 500 cells/cu mm. It may be mild(1.0-1.5X10^9/L), moderate (0.5-1.0X10^9/L), or severe (<0.5X10^9/L). [4] There is increased risk of infection when the count is less than 200 cells/cu mm and this is termed as agranulocytosis. ANC is low but the total white blood count is always within normal limits and monocytosis and eosinophilia may occur but they do not affect the rate of infection. [3] Associated Iron deficiency anemia may be coincidental or secondary to recurrent infections. These criterias are more applicable when there is reduced proliferation in the bone marrow itself and not of much value when there is peripheral destruction of cells, since neutrophils are available at the site of

infection. Therefore, autoimmune neutropenias may be asymptomatic in most cases even with very low ANC. [5] This is the most common form of neutropenia occurring in childhood and it affects only ~1 in100 000 children per year.

Many literatures have come up with various theories on its pathogenesis and spontaneous recovery which still are very vague. Some state that there may be a molecular mimicry of microbial antigens and post-infection autoantibodies or modification of antigens after drug use. Another hypothesis claims that these patients have an immature suppressor system and spontaneous recovery corresponds with the complete development of a suppressor T-cell counterpart. [2]

Autoimmune neutropenias are classified as- 'Autoimmune neutropenia of infancy/childhood (primary/isolated), Autoimmune neutropenia of adulthood (primary/isolated), Secondary/associated autoimmune neutropenia (can be infection induced, drug induced, vitamin B12/folate deficiency), Autoimmune neutropenia after bone marrow transplantation'. [2]

Exact etiology of this condition is unknown but many studies have shown that anti neutrophilic antibodies may be responsible. Most commonly identified antibodies are IgG antibodies against neutrophil glycosylated isoforms of FC gamma RIIIb and human neutrophil antigen 1(HNA1), which are linked to the plasma membrane via a glycosylphospha-tidylinositol anchor. [6]

Most common infections occurring in children are otitis media, respiratory tract infections or febrile illness and only some present with severe infections like gastroenteritis or skin sepsis. [3] Bone marrow examination is an important investigation to exclude other causes of chronic neutropenia. Usually the marrow is normocellular with myeloid hyperplasia and composed predominantly of early precursor forms. Diagnosis rests on the detection of anti neutrophilic antibodies though an absence of antibodies does not exclude the diagnosis. [6] Levels of these antibodies usually begin to wave off prior to improvement and can give an indication of recovery. [3]

Generally no specific treatment is given, other than maintaining personal hygiene and occasional antibiotics for minor infections. Sometimes serious infections may require treatment with IV immunoglobulins. G-CSF, IV immunoglobulins and corticosteroids have been shown to transiently increase neutrophil counts. [4] Excellent prognosis is noted in these children. The condition usually lasts for 2-3 yrs before spontaneous resolution, and virtually all patients recover by age of 5yrs. [4]

CONCLUSION

Chronic benign neutropenia is a rare and benign disorder with spontaneous recovery. Careful clinical and laboratory evaluation of the patient is required to prevent misdiagnosing it as leukemia. Close follow up of patient is often required to observe the progression and regression. This case is being presented for its novelty and rarity.

REFERENCES

1. Chung BH, Chan GC, Lee TL, Kwok JS, Chiang AK, Ho HK, Ha SY, Lau YL. Chronic benign neutropenia among Chinese children. Hong Kong Medical Journal. 2004;10:231-236.
2. Farruggia P. Immune neutropenias of infancy and childhood. World journal of pediatrics. 2016 May 1;12(2):142-8.
3. Lyall E G H, Lucas G F, Eden O B. Autoimmune neutropenia of infancy. J Clin Pathol 1992;45:431-434.
4. James RM, Kinsey SE. The investigation and management of chronic neutropenia in children. Archives of disease in childhood. 2006 Oct 1;91(10):852-8.
5. Newburger PE. Autoimmune and other acquired neutropenias. Hematology 2014, the American Society of

Hematology Education Program Book. 2016 Dec 2;2016(1):38-42.
6. Inoue S, Coppes MJ. Pediatric Autoimmune and Chronic Benign Neutropenia [Internet]. Emedicine.medscape.com.2020 [cited 17 July 2020]. Available from: https://emedicine.medscape.com/article/954781

How to cite this article: Garg R, Belurkar SV, Suvarna N. Chronic benign neutropenia- a case report. Int J Health Sci Res. 2020; 10(8):132-135.

******