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P1556 HYPER -FERRITINEMIA IN PEDIATRIC ONCOLOGY PATIENTS SECONDARY TO TREATMENT: DIAGNOSTIC APPROACH AND OUTCOME

Topic: 29. Iron metabolism, deficiency and overload

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Background:

Multiple red blood cell transfusions during cancer therapy are the leading cause of iatrogenic hyper- ferritinemia which of notice is often overlooked. Patients with genetic predisposition for hemochromatosis have a higher chance of developing hyper-ferritinemia, with a potential to promote significant organ dysfunction.

Aims:

The aim of this study was to identify pediatric oncology patients with high levels of ferritin post cancer treatment, and refer their management and outcome.

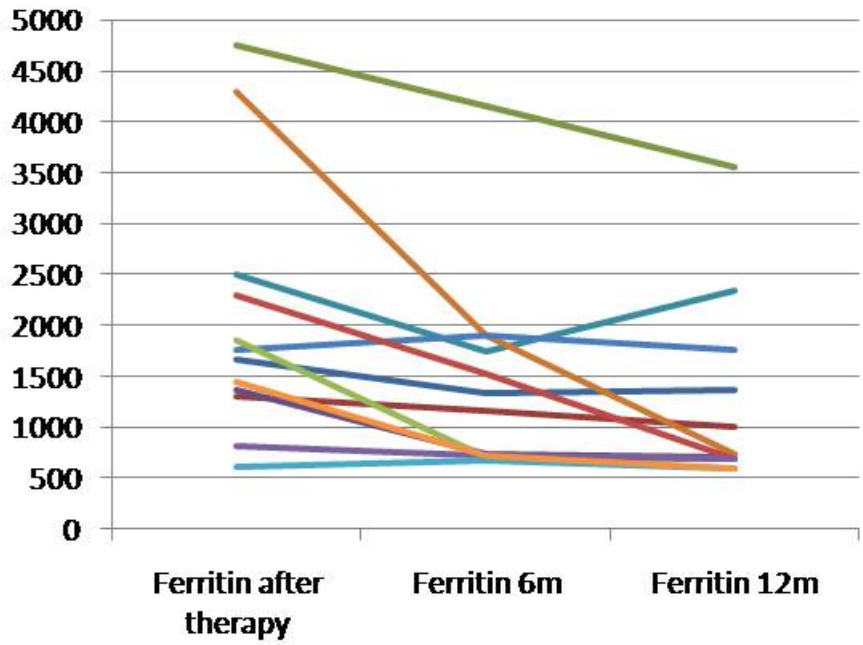
Methods:

Selected patients' charts of our Department were retrospectively reviewed. Patient and treatment characteristics, ferritin levels and their progression over time, genetic testing for hemochromatosis genes, treatment and outcome were recorded and analyzed.

Results:

Twelve (12) patients were identified with increased (>600 ng/ml) ferritin levels, diagnosed with Acute Lymphoblastic Leukemia (N=5), Acute Myeloid Leukemia (N=1), Non-Hodgkin Lymphoma (N=1), Neuroblastoma (N =2), Medulloblastoma (N=1), Rhabdomyosarcoma (N=2) from 1995 to 2020. Mean patient age at diagnosis was 7.1 years (range 3.0-15.2 years). Three patients had undergone Hematopoietic Stem Cell Transplantation, 2 of them twice. Mean blood transfusions per patient were 42 (range: 9-62), with 6 patients receiving more than 50 transfusions each (10-15 ml/kg). Of 6 patients tested for hemochromatosis genes, 2 were negative for the common mutations of HFE, TfR2 FPN1 genes, 1 was found double heterozygote for the His63Asp and Cys282Tyr HFE mutations and 1 patient carried the HFE H63D mutation. Eight (8/12) patients were observed only, and ferritin reduction of 5.7% to 69.7% was observed, within 12 months of follow-up, but none normalized ferritin levels, the lowest value being 560 ng/ml (Image). One patient received chelation therapy (deferasinox po) for 13 months, 1 patient (heterozygous for beta-thalassemia trait) received 37 phlebotomy sessions and 2 received combination of chelation (deferasirox only or with deferoxamine) and short-course phlebotomies. Out of the later intervention group of patients, none achieved normal ferritin levels after an observation period of 12 months. With a mean follow up of 3.7 years for all patients (range 1,1-15,7 years), mean ferritin levels after cancer therapy and at +12 months, were 2056 ng/ml (range: 621-4750 ng/ml) and 1227 ng/ml (range: 590-3550 ng/ml), respectively. Only 1 patient achieved ferritin levels under 500 ng/ml following 3-years of phlebotomies, and she has remained so, for another 4 years of follow-up (b-thalassemia heterozygote and H 63D HFE heterozygote for the hemochromatosis genes).

Image:



Summary/Conclusion:

Iatrogenic iron overload post antineoplastic therapy in pediatric patients is a common and often overlooked diagnosis. Prompt evaluation and appropriate treatment is necessary. Patients presenting with hyper-ferritinemia for extended time period could bear hemochromatosis gene mutations. Since the symptoms are absent initially, pediatric patients after cancer treatment should be screened for ferritin levels. If persistently high levels are documented, evaluation of relevant mutations and appropriate treatment is necessary. The long-term effect of high Ferritin levels is not fully documented, but it has the potential to promote significant organ dysfunction. Further research is necessary in this field.