

Frequent Blood Transfusions and Alloimmunization

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Anemia is a common problem faced by cancer patients and is multifactorial including chronic illness and myelosuppressive chemotherapy. The degree of anemia depends on the type and extent of cancer, other comorbidities and the aggressiveness of treatment. Repeated cycles of chemotherapy has a cumulative effect on erythropoiesis. The symptoms of anemia adversely affect the quality of life. The commonest symptoms are fatigue and dyspnea on exertion, which slows down patients' daily activities. When anemia is severe and needs quick correction red blood cell (RBC) transfusions are required [1]. But this is associated with many concerns. One is being the risk of transmission of infections like Hepatitis C and B and HIV. But the incidence has reduced significantly by adequate screening of blood. Blood transfusion can also result in allergic and hemolytic reactions. Besides this there is risk of alloimmunization especially with multiple blood transfusions resulting in increased risk of transfusion reactions. There are several ways that this can be avoided. Lessening the frequency of blood transfusion by reserving it for hemoglobin less than 8 [2, 3]. Another way to minimize the need for blood transfusion is to identify and correct simple nutritional deficiencies (iron, folate, or vitamin B 12 deficiency) as many times cancer patients have inadequate diet. Anemia can be because of their immunocompromised state chronic illness and sometimes due to Iron deficiency anemia because of tumor bleed or some occult bleeding. Some cancers like chronic lymphocytic anemia can be associated with autoimmune hemolytic anemia. Early identification and management of these factors will help in avoiding blood transfusions. The ideal hemoglobin level in a cancer patient found to be associated with good quality of life and ability to carry to routine activities of daily living is greater than 12g/dl [4]. Anemia is more frequent in some hematological malignancies like lymphomas and in some solid tumors like lung and gynecologic (ovarian) or genitourinary tumors in which the incidence may be as high as 50%-60%. The effect of treatment on hemoglobin is cumulative, with the incidence increasing from 30% after the first cycle of treatment to 59% by the fourth cycle associated with progressive cancer related fatigue

[5]. Type of chemotherapeutic agents is also associated with anemia *i.e.* higher incidence with Cisplatin, Taxanes and Vinorelbine. In patients with higher risk of anemia Erythropoietin can be used. Erythropoietin increases the hemoglobin by 1.8-g/dl from baseline (P <001; all tests were two-sided) which continues to increase significantly on each monthly visit (P <.001) [6]. Other causes of anemia should be ruled out in every cancer patient before starting epoetin alfa. The starting dose of epoetin alfa is 10 000 U subcutaneously three times weekly [7]. The hemoglobin level should increase by at least 1 g/dL. If hemoglobin fails to rise the dose of erythropoietin should be increased to 20 000 U three times weekly. If hemoglobin does not improve on this dose also further increasing the dose is unlikely to improve the hemoglobin. But before calling a patient erythropoietin refractory, one should rule out iron deficiency and during treatment with erythropoietin also iron stores can get depleted. Therefore one may need to check iron stores repeatedly.

In conclusion alloimmunization can be avoided by decreasing the need for blood transfusions. Blood transfusion should be reserved for patients in whom we don't have enough time for erythropoietin to be effective *i.e.* for an emergency (*e.g.* hypotension secondary to acute blood loss), anemia severe enough to be symptomatic with dyspnea, angina or syncope or when other comorbidities increase the risk of an adverse cardiac event even with mild-to-moderate anemia [8]. And for patients who end up getting multiple transfusions further studies are needed including other cancers also like hematological cancers, lung and gynecological cancers as well to find out the incidence of allantoantibodies. In patients with h/o multiple blood transfusions it might be advisable to screen for allantoantibodies to minimize the risk of transfusion reactions and associated morbidity.

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ANSWER TO QUESTION # 1

High risk chromosomal abnormalities in multiple myeloma are:

- Del(17p)
- Translocation t(4; 14)
- Translocation t(14; 16)

ANSWER TO QUESTION # 2

- What are the findings in the given images?

In arterial phase a well-defined enhancing rounded lesion is seen in left lobe of liver.

Porto venous phase shows heterogenous enhancement of same lesion with varices noted in gastroesophageal region.

Delayed phase shows washout of contrast in lesion.

Liver margins are irregular in outline.

- What is the differential diagnosis?

Hepatoma with varices likely in post cirrhotic liver.