Haematologica 1996; 81:588

PLASMA CELLS AND IRON GRANULES

Guido D'Angelo

Laboratorio di Chimica-Clinica, Ematologia e Microbiologia, Azienda Sanitaria Locale n. 2, Gallarate, Ospedale "A.Bellini", Somma Lombardo, Italy

The presence of iron granules in plasma cells is a particular morphologic aspect that is not frequently found in bone marrow. Phagocytic activity of plasma cells has previously been demonstrated and can be seen in multiple myeloma. In this case the phagocytic activity in malignant plasma cells is characterized by the incorporation of erythrocytes or granulocytes. The incorporation of iron granules in plasma cells was described in 1938[1] in a patient with hemochromatosis. It has also been noted in alcoholic patients with megaloblastic anemia, cirrhosis and hemochromatosis.[2,3] Moreover, the phenomenon was found in refractory anemia, aplastic anemia, porphyria cutanea tarda. Iron granules in plasma cells are stained yellow-brown by May-Grünwald-Giemsa (Figure 1A), but they are blue in Perls' Prussian blue stain (Figure 1B). The iron granules in plasma cells were quantitated by the following scheme:[4] grade 0: no plasma cells with iron granules; grade 1: iron granules in plasma cells identified with difficulty only under oil immersion (×1,000); grade 2: iron granules in plasma cells identified in one or less than 1 plasma cell per particle at ×400; grade 3: plasma cells with iron granules easily identified at ×400. In alcoholic patients with or without iron overloading, plasma cell iron is located in mitochondria and the biochemical mechanism of iron storage is the same as that which causes the formation of ringed sideroblasts.[5] Other authors[4] have noted that iron granules were always located in membrane-bound lysosomal vesicles as ferritin particles, and that they often appeared to be situated between the Golgi region and rough endoplasmic reticulum. Both the source of the phenomenon and the causal mechanism are unknown. It has not yet been determined whether the presence of iron granules in plasma cells could be the expression of a specific nosologic entity.

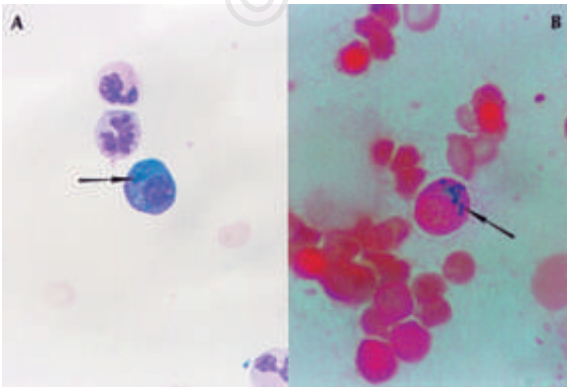

Figure 1. A 62-year-old female patient with cryptogenetic cirrhosis and MGUS IgM-K.
A) Bone marrow smear stained by the May-Grünwald-Giemsa method. Arrow, iron granules. (High magnification ×1,000).
B) Bone marrow smear stained by Perls' Prussian Blue and counterstained with safranin 0.1%. This stain verifies the hemosiderin nature of the granules. Arrow, iron granules. (High magnification ×1,000).

References

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Correspondence: Guido D'Angelo, Laboratorio di Chimica-Clinica, Ematologia e Microbiologia, Ospedale "A. Bellini", 21019 Somma Lombardo, Italy. Tel. international +39.331.751873. Fax. international +39.331.751810.