Octaploidy in idiopathic thrombocytopenia purpura: Is it incidental or causal?

Sir,

Idiopathic thrombocytopenia purpura (ITP) is a bleeding disorder in which the immune cells produce antibodies against platelets. In the previous issue, Makroo *et al*.[1] reported a novel case of octaploidy in ITP. Bone marrow karyotyping and chromosomal analysis revealed two cell lines. Eighty percent of the cells analyzed revealed apparently normal male karyotype, and 20% of the cells analyzed revealed a total of 184 chromosomes, suggesting octaploidy (8n). Generally, in ITP cases, on bone marrow aspiration or biopsy, megakaryocyte appears normal or may show a greater than normal number. Megakaryocyte is a giant cell of bone marrow containing a greatly lobulated nucleus, from which mature blood platelets originate. The megakaryocyte develops through the following lineage: CFU-Me → megakaryoblast → pro-megaka yocyte → megakaryocyte. The cell eventually reaches the megakaryocyte stage and loses its ability to divide. However, it is still able to replicate its DNA and continue development and become polyploid.[2] The cytoplasm continues to expand and the DNA complement can increase from 2N to 4N to 8N, and so on.

In the case report by Makroo *et al*.,[1] the patient was a known case of ITP and showed a very low vitamin B12 value. Vitamin B12 deficiency leads to impaired DNA synthesis and the cell cycle cannot progress from the G2 growth stage to the mitosis (M) stage, resulting in G2/M phase arrest. G2/M phase arrest compels the cells to remain in a tetraploid condition. If we consider that vitamin B12 might have lead to G2/M phase arrest and subsequent tetraploidy, anyhow, the 8N karyotype cannot be a result of the G2/M phase arrest. The abnormal megakaryocytes or large megakaryocytes may have polyploidy. However, the number of megakaryocytes and morphology need to be studied in a BM smear. A similar genetic presentation (octaploidy) was reported in a case of essential thrombocythemia.[3] Moreover, Anastasi[4] has reported his observations on the geometry of megakaryocyte mitotic figures in an excellent manner, stating a single tertrahedron geometry for 8N. His observations indicate that polyploidy is not uncommon in megakaryocytes. The role of octaploidy in human diseases has not been studied. As the polyploidy results in late cell division, the DNA repair-defective pathways should be studied in such patients to understand the genomic instability in ITP.

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