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Letter to the Editor

Negative Rhesus Antigen D in Childhood Leukemia: A Risk Factor or a Defense Mechanism?

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Dear Editor-in-Chief

Acute lymphoblastic leukemia (ALL) is the most frequent cancer in the under-15-yr-old children accounts for one-third of childhood cancers (1). Individual studies and large consortia, such as the Childhood Leukemia International Consortium (CLIC), are exploring a constellation of factors related to the perinatal origins of the disease (2).

An initial investigation on the association between disease incidence and ABO blood group was summarized by Robert in the middle of the 20th century (3). Since then, numerous studies were conducted to focus on the same idea, and within the past several decades, this association was confirmed in some cancers (4, 5). The idea has been supported by multiple systematic reviews and meta-analyses (6, 7); however, it appears that rhesus group system has rarely been deliberated.

In a recently conducted clinical investigation in our referral center for childhood cancer (8), we encountered some significant incidental data. In that study, there were forty patients with ALL and except one of them, all were blood Rh negative.

In a report by Radhakrishnan et al (9), the authors presented two leukemic patients with blood group change during their treatment. The mechanism by which the blood group changed in leukemic patients was not clearly described, but they hypothesized that through epigenetic modifications on the transcription regulating regions of ABO gene in RBCs, malignant cells inhibit the transcription antigens, consequently altering the blood group.

More than 80% of Iranian people have Rh positive blood group (10). Hence, we suggested that rhesus antigen D might have a similar situation in ALL patients. Additionally, a polymorphism mechanism might be coupled with such phenomenon (4). Furthermore, it could be possible that rhesus antigen D negative has some potency in conducing ALL, accounting as a risk factor. On the other hand, if this antigen plays a role in the progression of the disease, the immune system might suppress the presentation of this antigen on the red blood cells through epigenetic or other mechanisms.

To find out a rigorous scientific explanation and its exact mechanism, more experimental molecular, in vitro and in vivo, studies are warranted.

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Conflict of interest

The authors declare that there is no conflict of interest.

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