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Letter to Editor

Discriminating Indices between Common Microcytic Anemias and Normal Population

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Dear Editor

With great interest, I studied the paper by Bhttacharyya et al entitled "A new approach based on erythrocyte indices to exclude normal populations from chromatography based thalassemia screening programs with very high fidelity" in the last issue of Iranian Journal of Blood and Cancer.[1] Thalassemia minor (MT), either β or α, is the most frequent single gene mutation in human beings affecting 6% of population worldwide. It is more frequent in the Mediterranean region, Africa and South-East Asia. On the other hand Iron deficiency anemia (IDA), either nutritional or secondary to gastrointestinal or menstrual bleeding, is the most frequent cause of acquired anemia. Differentiation between these two types of anemia is important because both of them present themselves as microcytic anemia.[2-6] However, in the thalassemia belt, some patients may have mixed IDA and TM.Therefore discrimination indexes should discriminate three categories from the normal population and each other.[7]

In the Fars Province, Islamic Republic of Iran, the screening program for control of thalassemia major was started in September 1991. After compiling large data of pre-marriage couples, pregnant women, soldiers, high school students, and some infants before Measles vaccination, we modified Mentzer Index, and later Dr. Mohammadi and his colleagues at Kerman University of Medical Sciences suggested two discriminating indexes which is shown in Table 1, and will be discussed here.

Modified Mentzer Index only for persons who have microcytosis (MCV<80 fl): MCV/RBC: If<13 suggests TM, If 13-15 Mixed IDA and TM, If>15 suggests IDA. By this modification both sensitivity and specificity of the Mentzer Index increase to 86% and 90%, respectively. Note that the normal population should be excluded before using this Discriminating Index.

Kerman Index 1 (Mentzer Index is multiplied by MCH): MCV*MCH/RBC: If<250 suggests TM, If 251-320 suggests Mixed IDA and TM, If 321-370 suggests IDA, If>371 suggests normal population. This Index has a Sensitivity=99%, and Specificity=86%.

Kerman Index 2 (Kerman Index1 is divided to MCHC): MCV*MCH/RBC*MCHC If<8 suggests TM, If 8-10.5 suggests Mixed IDA and MT, If 10.6-13 suggests IDA, If>13 suggests normal population. This Index has sensitivity 99%, and Specificity=93%.

My suggestion is that Bhttacharyya and colleagues

Table 1: Discrimination Indices, their descriptions, sensitivities and specificities

Discriminating Index	Description	T M	Mixed IDA & TM	IDA	Normal	Sensitivity	Specificity
Modified Mentzer	MCV/RBC If MCV<80 fl	<13	13-15	>15	Not defined	86%	90%
Kerman 1	MCV*MCH/RBC	<250	251-320	321-370	>371	99%	86%
Kerman 2	MCV*MCH/RBC*MCHC	<8	8-10.5	10.6-13	>13	99%	93%

TM: Thalassemia minor; IDA: Iron deficiency anemia

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reconsider the above-mentioned Indexes in their data set, and produce an application for their decision tree to introduce a user-friendly approach for discrimination between normal and common causes of microcytic anemias.

Conflict of Interest: None declared.

References

1. Samanta A, Chaudhuri PK, Das U, Bhattacharyya N. A new approach based on erythrocyte indices to exclude normal population from chromatography based thalassemia screening programs with very high fidelity. IJBC 2021;13(4): 107-118.
2. Karamifar H; Shahriari M; Amirhakimi G.H. Linear growth deficiency in ß-Thalassemia patients: Is it growth hormone dependent? IJMS 2002; 27: 47-50.
3. Karamifar H; Shahriari M; Sadjadian N. Prevalence of endocrine complications in ß-Thalassemia major in the Islamic Republic of Iran. Eastern Mediterranean health J. 2003; 9: 55-60.
4. Karamifar H; Shahriari M; Amirhakimi G.H. Failure of puberty and linear growth in beta-thalassemia major. Turk J Hematol. 2005; 22: 65-69.
5. Shahriari M, Alidoost HR. The Protective Effect of β-Thalassemia Trait against Childhood Malignancies in an Unselected Iranian Population. Middle East Journal of Cancer (MEJC) 2011; 2(1): 27-30.
6. Shahriari M, Pishva N, Bahrami R, Alemansuri A, Naghshzan A. Neonatal screening for anemia in healthy, fullterm Iranian newborns: is there any indication? European Journal of Biomedical and Pharmaceutical sciences (EJBPS) 2016:3(2): 351-354.
7. Shahriari M, Tootoonchi H. Better Results Obtained by Daily Supplementation of Iron Drops in Toddlers with Iron Deficiency Anemia in Iran. IJBC. 2009; 1 (4):159-165.

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