

Undiagnosed Anemia in Pediatric Patients with Congenital Heart Diseases

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Dear editor,

Anemia is an important risk factor for morbidity and mortality in patients with cyanotic and acyanotic congenital heart disease (CCHD, ACHD).^{1,2} ACHD heart failure may occur and worsen by anemia as a comorbidity.³⁻⁵

In CCHD with a right to left shunt, arterial oxygen saturation decreases and red blood cell count may reach to high level and hyperviscosity develops. In addition, in anemic patients especially those with microcytic iron deficiency anemia, permeability of microcytic erythrocytes decreases in comparison to normocytic cells, therefore thromboembolic and cardiovascular events are encountered more commonly.⁶⁻¹¹

In CCHD, normal hemoglobin represent relative anemia and may have disastrous effects,^{8,9} and the role of anemia in management of heart failure and increasing risk of thromboembolic events and hypercyanotic spells in CCHD has been well recognized.^{3,4}

This study performed to determine the prevalence of unrecognized anemia in pediatric patients with different congenital heart diseases who referred for cardiac surgery.

In a retrospective study, we reviewed the preoperative chart of 100 patients with different CCHD and ACHD, admitted to the cardiac surgery ward of Namazi Hospital affiliated to Shiraz University of Medical Sciences, Shiraz, Iran, between 2008 and 2009. All the patients had corrective or palliative operations for different congenital heart diseases.

Anemia in ACHD defined by Hb <12, MCV<80

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and in CCHD by Hb <15, MCV<80.

The study recorded the type of CHD, patient's age, preoperative Hb (mg/dl) level, and MCV.

Data were analyzed by using SPSS (Statistical package for the social sciences, SPSS Inc.) computer programs. Data explained as mean \pm standard deviation.

The diagnosis was ACHD in 60 patients with mean age 27.71 ± 13.56 months and CCHD in 40 patients with mean age 31.88 ± 47.93 months.

A cyanotic group had mean Hb 13.56 ± 9.44 , MCV= 80.4 ± 12.36 and in cyanotic patients, mean Hb and MCV were 15.97 ± 17.19 and 73.76 ± 27.26 respectively.

In this study, among 60 patients with ACHD, %50.7 had Hb<12 and 40.6% had MCV<80 and also 21.7% had MCV<75. In cyanotic group, about 75.9% had Hb<15, 55.2% had MCV<80 and 31% had MCV<75.

Table 1. Mean hemoglobin and mean corpuscular volume in acyanotic and cyanotic patients.

	Acyanotic	Cyanotic
Number of patients	60	40
Mean Hb	13.6 \pm 9.4	16.0 \pm 17.2
Mean MCV	80.4 \pm 12.4	73.8 \pm 27.3

HB: Hemoglobin, MCV: Mean corpuscular volume

The patients with heart disease are frequently anemic and anemia has a high prevalence among them in the absence of vitamin or mineral deficiency, hemolytic or other definable causes.⁵ However, it was emphasized that more than one third of the patients with CCHD had iron deficiency anemia,^{3,1} which may have been aggravated by concomitant disorders or a combination of factors.^{2,10}

Studies were clear that preoperative anemia es-

Table 2. Type of congenital heart disease and it's frequency in cyanotic and acyanotic patients.

Acyanotic		Cyanotic	
Ventricular septal defect	22	Tetralogy of fallot	31
Atrioventricular septal defect	20	Transposition of great artery	3
Patent ductus artriosus	2	Tricuspid atresia	4
Aortic stenosis	3	Pulmonary atresia intact ventricular septum	2
Subaortic stenosis	3		
Coarctation of aorta	8		
Aortic insufficiency	2		

pecially in heart diseases gives rise to postoperative cardiac events, complications and death, and the best parameters to determine in these patients are MCV, MCH or RDW values that is relatively easy and inexpensive methods.^{2,8-11}

In our study, we noticed that a significant number of patients with CHD had anemia preoperatively without being considered by physicians.

Many investigators found low dose iron therapy or preoperative administration of a single dose of recombinant human erythropoietin without autologous blood donations was beneficial by increasing hematocrit level.²

Indeed we recommend that for prevention of complications, morbidity and mortality, it is essen-

tial to asses preoperative of Hb level and MCV, and if anemia is present, patient must be treated. Indeed anemia is commonly unrecognized by physicians because it is often asymptomatic or exhibits largely nonspecific symptoms.

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