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Rare Diseases and Congenital Heart Diseases: A Call for Genetic Insight

LETTER TO THE EDITOR

To the Editor,

February 28 is celebrated all over the world as Rare Disease Day to increase the awareness of rare diseases and to accelerate the diagnosis and treatment of these diseases. If a disease prevalence is less than 1 in 2000, it is considered rare in Europe. In the USA, a disease is considered rare if it is 1 in 20 000. Each rare disease may be "rare" on its own, but collectively there are approximately 300 million people in the world living with a rare disease. In Türkiye, 2.9 to 4.8 million people are living with at least one rare disease, but this number is probably higher due to many undiagnosed cases. Seventy percent of these rare diseases are diagnosed in children.

Congenital heart disease (CHD) can be the first presenting sign of a rare disease. The dysmorphic features may not be present, or the disease can have very broad phenotypic features, as in DiGeorge syndrome (22q11.2 deletion syndrome), which is detected in approximately 2% of all patients with CHD[1] and in 13% of patients with specific cardiac malformations.

Referral to a geneticist increases the diagnosis rate of infants with CHD by 7-13%, after excluding Down syndrome.[2] Genetic counseling can have an impact on diagnostic, prognostic, and therapeutic decision-making. Patients with certain types of syndromes have different survival outcomes after surgery, and this is important for planning the right treatment plan as part of personalized medicine.[3] In Noonan syndrome, for example, there are bleeding tendencies and lymphatic anomalies which can affect cardiac care if not detected before. In Turner syndrome, 50% of the patients have CHD, most commonly bicuspid aortic valve and coarctation of the aorta. There may be associated coronary artery anomalies not detected by transthoracic echocardiography. Kabuki syndrome, Loeys–Dietz syndrome, Alagille syndrome, and Holt–Oram syndrome are other examples of rare diseases associated with CHD.

Patients with CHD now reach adulthood and have an increased risk of having infants with CHD.[4] If we know the genetic etiology of CHD, we know the inheritance pattern and can give accurate family planning advice. This means healthier children and a healthier society.

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