Heart Murmur among Lebanese Children: A Retrospective Study to Evaluate Epidemiological Features and Risk Factors

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Keywords

Heart Murmur; Congenital heart disease; Lebanon; Consanguinity

Abstract

Objective

This retrospective study aims to judge the influence of various variables incriminated as risk factors for pathological murmur (HM). Methods: The study is conducted among 277 kids aged between 0-14 years previous remarked medicine medical specialty consultation upon a replacement finding of associate degree isolated murmur. Therefore, they were divided into 2 teams (Case Group=pathological hectometer and management group=Innocent HM) through the physicist diagnostic technique diagnosing. A form was used soon to check all the socio-demographic factors and compare them between the 2 teams.

Results

Of 277 patients, pathological heart murmurs were found in 178 cases (64.26%). A statistically significant difference is found among seven variables: Consanguinity, Age<1 year, Low socio-economic status, Family history of congenital heart disease, North Region, Poly-malformation Syndrome, and presence of other clinical findings and abnormal symptoms associated to the murmur.

Conclusions

These results show that genetic factors are recognized as the ultimate risk factor for congenital heart diseases (CHD), whereas environmental factors play a decreasing role through prevention policies adopted worldwide such as control of maternal diabetes, alcohol use during pregnancy, teratogenic drugs and rubella.

Introduction

A heart murmur is a continuous sound that is audible with a common stethoscope, produced by turbulent blood along its passage through heart cavities. Often heart murmurs are innocent and do not underline a structural lesion. Heart murmurs are so frequent and touch almost 80% of neonates and 1/3 of infants and children. Therefore, it shall remain the chief cause of consultation in pediatric cardiology clinics. Congenital heart diseases (CHD) are also known for their high prevalence with an incidence reaching 0.5 to 0.8%; most cases being diagnosed during infancy and accounting only 1 to 2/1000 cases in school-aged children later on. Innocent heart murmurs are isolated murmurs with no other clinical or historical findings and no underlying structural cardiovascular disease. McCrindle et Al identified six auscultatory characteristics found in functional or innocent HM, which may help the clinician to establish the diagnosis without a cardiac ultrasound in almost 50% of cases. In general, 40 to 70% of heart murmurs in children, all ages combined, are due to functional murmurs, knowing that pathological heart murmurs (also referred as organic HM) are most likely to be found among infants aged less than a year. A heart murmur heard first at 6 months is associated to a higher risk of congenital heart disease; 1:7 vs. 1:50 if it is first heard at the age of 1 year. Cardiac ultrasound provides an accurate diagnosis and remains the gold standard test for evaluation of HM. However, it is suspected not to be cost-effective especially since innocent heart murmurs represent a great part of heart murmurs in school-aged children. Referral to pediatric cardiologist seems to be reasonable since he is aware of risk factors of pathological murmurs and master the art of cardiac auscultation. Due to the multitude of etiologies of congenital and acquired heart diseases, we

reviewed the literature to identify them clearly. This study aimed to compare the influence of these main factors compared between two groups of children selected randomly presenting either pathological or innocent heart murmur. In fact, multiple university hospitals conducted studies to evaluate heart murmurs in children. For example, the study done in Charles de Gaulle University Hospital (CHUP-CDG) in Burkina Faso published in 2015 showed upon 109 patients followed among 23 months that 39% of cardiac ultrasounds are done for a newly heard heart murmur, in which 28.26% corresponded to Ventricle Septal Defect (VSD). Furthermore, an observational study conducted in Egypt within the year of 2015 and enrolling 183 patients showed that 53% of heart murmurs are innocent with no statistically significant difference between pathological and innocent murmurs regarding age, consanguinity and family history of congenital heart disease. Recurrent respiratory tract infections seem the main significant factor for pathological heart murmur. An another study made in the Middle-East region was done in Saudi Arabia in 2009 and showed that age represents a major factor in evaluating heart murmur, for what 42.5% of heart murmurs during neonatal period are due to structural heart disease. As for our study, we managed to distribute our enrolled patients into two groups after a complete cardiac examination and adequate echocardiography for all children aged between 0-14 years old referred for a newly heard heart murmur, with no anterior cardiac symptoms. The two groups are compared for common variables listed in the literature by adequate statistic tests and we finally established the main risk factors for pathological heart murmur.

Conclusion

While evaluating characteristics of heart murmur in Lebanese children, we managed to identify seven risk factors for pathological heart murmur, in order to establish new preventive measurements against controllable factors. Those factors are child age <1 year old, region where he comes from, socioeconomic status, consanguinity, family history of CHD, malformations, and context of diagnosis. Since genetic factors are widely incriminated, genetic counseling seems the remaining hope to limit risk of transmission of hereditary heart diseases; along with limitation of consanguine marriages by managing some awareness campaigns. In parallel, some environmental factors must be totally eradicated such as rubella by immunizing all girls and more strict policies for drug prescriptions during pregnancy and organizing more awareness campaign against fetal alcohol syndrome and a strict control of gestational diabetes. Finally, we should know the prevalence and characteristic features of innocent heart murmurs so we can limit parental anxiety in front of a newly heard heart murmur.