Chapter 12

RISK SCORING SYSTEMS IN CONGENITAL CARDIAC SURGERY

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Introduction

Various strategies, lists, study groups were formed to determine the mortality and morbidity in cardiac diseases, especially for the ones in need of severe surgeries; these led the way for the heart surgeons to determine the extent to which the patients would benefit from the surgery(1).

These systems have been in use regularly for the adult patients from past to present and various risk classification systems have been developed (Initial Parsonnet Score, Cleveland Clinic Score, EuroSCORE etc.), but in congenital heart surgery, such systems could not been established, or they have not been used commonly worldwide since recent years. One of the most important reason for this is the wide variety of anatomical diagnoses and surgical procedures in congenital heart diseases (2).

With the increasing experience in congenital cardiac surgery, the number of centers and surgeons performing these procedures, need for standardization of the processes and centers emerged. Although there were scoring systems already in use for this purpose, they were not able to provide standardization or to evaluate the profit / loss ratio in detail. Moreover, most of these systems were not developed particularly for cardiac surgery patients; they were be got for the evaluation of intensive care patients regardless of the underlying disease. Studies on this issue, -developing a risk scoring system which particularly for congenital heart diseases- have just been able to provide standardization in the late 90's.

Evaluating and improving the quality of care, assessing surgical performance, and reporting the results is essential in modern congenital cardiac surgery recently (3). There are different scoring systems for pediatric cardiac surgery to determine the risks and difficulty levels. In addition, healthcare centers might use scoring systems to predict their mortality and morbidity rates; thus, to determine their current situation compared to national and international healthcare centers and to prepare for necessary regulations. Risk Adjustment in Congenital Heart Surgery (RACHS-1), Aristotle Basic Complexity (ABC) score, Aristotle Comprehensive Complexity (ACC)

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all of these studies have been seeking the answer to the same question: Can these studies be adapted to the group of patients we are interacting with?

Congenital heart surgeons in Turkey also started to use these systems as aforementioned before. Sabuncu et al. in 2012 reported the comparison of 3 risk evaluation systems (RACHS-1, ABC and ACS) in a group of413patientsconsisted from all patient groups, for 2 years , and findings of this study showed that these systems could predict more than expected(1). Another more comprehensive study for comparison of 4 risk evaluation systems (RACHS-1, ABC, ACS and STS-EACTS Mortality Score) from Turkey by Yildiz O et al. (10) with a large group of1950 patients, concluded that these systems have been more usable with the improvements in patient registry system in the country, but using only one system was not enough.

One of the first extensive study on this issue was RACHS-1 (Risk Adjustment in Congenital Heart Surgery). RACHS-1 followed by "Aristotle Basic Complexity Score (ABC)" and "Aristotle Comprehensive Complexity Score (ACS)". Recently, "STS-EACTS Mortality Score" have been developed as easier-to-use, most comprehensive one; still needs to be developed furthermore. For the past several years, risk adjustment in STS-CHSD has been based on estimated risk of death of the primary procedure of the operation, age, weight, and prematurity. However, patient-specific preoperative factors in risk models for pediatric and congenital cardiac operations could lead to increased precision in predicting the risk of operative mortality and comparison of observed versus expected outcomes (19).

After all, no matter how many studies performed about this subject; as congenital heart surgery contains a wide range of variables -from anatomy to physiology, from age to body weight, from additional diseases to sociocultural structure of the society - it seems nearly impossible to create one very accurate scoring system. However, use of these systems widely, means new and larger databases and these databases would help to improve the existing systems. The proper use of these systems would also improve the quality of congenital heart surgery centers and surgeons would lead to set a standard -especially in developing countries- and beyond these to realize where and when to stop and to think about the necessity and timing before planning a surgery.

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