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Congenital Heart Anomalies in Babies with Esophageal Atresia and its Mortality

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Abstract: Congenital heart anomalies in patients with esophageal atresia are associated with a higher mortality but it is not the cause of it. In patients with Esophageal Atresia (EA) with and without Tracheoesophageal Fistula (TEF) the associated cardiac malformation is the most common. Form 2000 to 2006, 115 infants (66 boys and 49 girls) with EA/TEF have been diagnosed, admitted and treated at our department of pediatric surgery in general pediatric hospital, Tabriz. We study retrospectively all patients' documents with EA/TEF and collected necessary information such as: age of diagnosis, Wight, gender, type of EA, type of congenital heart anomalies and mortality rate. Data analyzed with SPSS 11.5 ant T-test and Chi-square. Descriptive finding reported as mean and present of frequency and the level of meaningfulness was considered as $p<0.05$. Forty five babies (26 boys and 19 girls) were died. Congenital heart disease was found in 39 out of 115 (33.9%) patients. Mean of diagnosis age in died cases was 2.96±3.39 days and in improved cases was 2.56±2.99 days and no significant difference was found between diagnosis age and mortality ($p = 0.510$). Mean of birth weight in died cases was 2496.33±625.73 g and in improved cases was 2706.29±524.54 g mean of birth weight in died cases was significantly higher ($p = 0.031$). Less birth weight was important prognostic factor and mortality was associated with low birth weight. In our study, significant correlation was found between congenital heart anomalies and mortality rates ($p = 0.007$). Premature infants with EA have a higher mortality and morbidity than term infants with EA.

Key words: Esophageal atresia, congenital heart anomalies, mortality, babies, disease

INTRODUCTION

Congenital heart disease is the most common congenital malformation associated with Esophageal Atresia (EA) (Chittmittrapap *et al*., 1989; Myers *et al*., 1992; Okada *et al*., 1997). Previous reports have indicated a higher mortality for babies with esophageal atresia if there is associated heart disease (Mellins and Blumenthal, 1964; Choudry *et al*., 1999; Holder *et al*., 1987; Beasley and Myers, 1992). However, these institution based series were written from a surgical perspective and could be biased because of early deaths before referral to the centre or because institutions with an interest in the diagnosis may attract a disproportionate amount of more complicated referrals from other centers. Many of the cardiac abnormalities reported are minor and would be expected to have a low mortality (Kimble *et al*., 1996; Poenaru *et al*., 1993; Greenwood and Rosenthal, 1976), so the pronounced influence of congenital heart disease on survival is surprising.

The aim of this study is to determine congenital heart disease in babies with esophageal atresia.

MATERIALS AND METHODS

Form 2000 to 2006, 115 infants with EA/TEF have been admitted and diagnosed and treated at our Department of Pediatric Surgery in General Pediatric Hospital, Tabriz.

We study retrospectively all patients' documents with Ea/TEF and collected necessary information such as: age of diagnosis, birth weight, gender, type of EA, Type of congenital adjunct anomaly, mortality rate and familial history. Patients after diagnosis evaluated by Trans Thoracic Echocardiography (TTE) by author and determined cardiac anomalies.

Classification of esophageal atresia

Class A: Esophageal atresia without tracheoesophageal fistula.

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Class B: Esophageal atresia with proximal tracheoesophageal fistula.

Claas C: Esophageal atresia with distal tracheoesophageal fistula.

Data analyzed using SPSS 11.5 ant T-test and Chi-square. Descriptive finding reported as mean and present of frequency and the level of meaningfulness was considered as $p<0.05$.

RESULTS

A total number of 115 cases (66 males and 49 females) of EA and/or TEF were admitted in our hospital. The distribution of esophageal anomalies seen is shown in Fig. 1. None of our patients had isolated TEF.

Forty five babies (26 boys and 19 girls) were died.

Mean of diagnosis age in died cases were 2.96±3.39 days and in improved cases were 2.56±2.99 days and no significant difference was found between diagnosis age and mortality ($p = 0.510$).

Mean of birth weight in died cases was 2496.33±625.73 g and in improved cases was 2706.29±524.54 g. Mean of birth weight in died cases was significantly higher ($p = 0.031$).

The mean birth weight was 2.6 kg (range 1.2-4.4 kg) and 45 out of 115 (39.1%) had a birth weight of less than 2.5 kg. The majority of our patients were referrals from nearby hospitals.

Prevalence of congenital heart disease: Congenital heart disease was found in 39 out of 115 (33.9%) cases.

Pattern of congenital heart disease: The patterns of congenital heart disease found in 39 patients are shown in Table 1.

Type of congenital anomalies: Table 1 lists the 39 cardiac Anomalies in patients with esophageal atresia. Eleven (28.2%) had complex heart disease, 19 (48.7%) significant heart disease and nine (23.1%) minor heart disease.

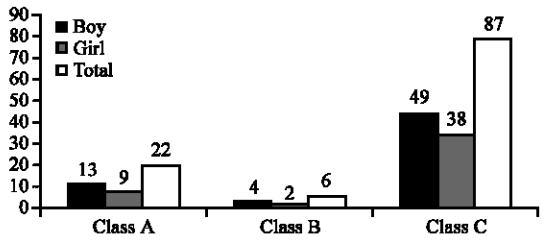

Fig. 1: The distribution of esophageal anomalies in two sexes

Table 1: The patterns of congenital heart anomalies in two sexes

	Gender		
Type of congenital heart anomalies	Male	Female	Total
Atrial Septal Defect (ASD)	18	17	35
Ventricular Septal Defect (VSD)	4	11	15
Patent Ductus Arteriosus (PDA)	6	12	18
Tricuspid Regurgitation (TR)	8	9	17
Mitral Regurgitation (MR)	1	4	5
Left Ventricular Hypertrophy (LVH)	3	0	3
Tetralogy Of Fallot (TOF)	1	1	2

Mortality rate in babies with and without congenital heart disease was 56.4 and 30.2%, respectively.

Mortality rate in babies with congenital heart disease was significantly higher ($p = 0.007$).

DISCUSSION

The birth prevalence of esophageal atresia in our population is similar to that in previous studies (Greenwood and Rosenthal, 1976).

However, the prevalence of cardiac defects in our patients with esophageal atresia is similar to other studies (13.2-39%) (Myers *et al*., 1992; Tulloh *et al*., 1994).

Survival in children with esophageal atresia and normal hearts is excellent. Other long term studies have noted appreciable improvements in survival in recent years (Okada *et al*., 1997; Ein and Shandling, 1994). This reflects advances in surgery and neonatal care of previously high risk groups such as low birth weight infants and infants with cardiac problems (Waterston *et al*., 1962; Myers, 1992). Survival in the group with congenital heart disease is poorer. We found no early deaths resulting from congenital heart disease.

CONCLUSION

Less birth weight was important prognostic factor and mortality was associated with low birth weight. In our study, significant correlation was found between congenital heart anomalies and mortality rates ($p = 0.007$). Premature infants with EA have a higher mortality and morbidity than term infants with EA.

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