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Original Research Paper

Surgery

OUTCOMES IN TETRALOGY OF FALLOT – INSTITUTIONAL EXPERIENCE FROM A PEDIATRIC TERTIARY CARE CENTER, INSTITUTE OF CHILD HEALTH, CHENNAI.

Dr Jaikaran. G. K Mch Cvts, Professor Of Paediatric Cvts, Ich Egmore

Dr Abinayavallaban. P . A * Mch Cvts Postgraduate, Madras Medical College *Corresponding Author

ABSTRACT Tetralogy of Fallot (TOF) is one of the conotruncal family of heart lesions in which the primary defect is an anterior deviation of the infundibular septum (the muscular septum that separates the aortic and pulmonary outflows. The degree of pulmonary outflow obstruction varies, with the severity of the obstruction determining the degree of the patient's cyanosis. Corrective surgical therapy consists of relief of the right ventricular outflow tract obstruction by removing obstructive muscle bundles and by patch closure of the VSD. The surgical risk of total correction in major centers is <5%. We conducted a retrospective study in our institute of paediatric CVTS, Egmore, regarding the outcomes and the predictive factors of mortality following TOF repair between 2014 -2018.

KEYWORDS :Tetralogy of fallot, intracradiac repair, mortality, predictive factors

BACKGROUND

Tetralogy of Fallot (TOF) – is a complex congenital cyanotic heart disease characterized by pulmonary stenosis, ventricular septal defect, overriding of the arch of aorta and right ventricular hypertrophy. It constitutes around 5-7% of all congenital heart diseases. Arthur Louis Etienne Fallot was the first to describe the four features of TOF in 1888. The first palliative operation for TOF was done by Dr. Alfred Blalock in 1944 and the first successful corrective procedure was done by Dr. Lilleihi in 1954. Surgical correction of TOF often poses a series of challenges during surgery and later in the postoperative period [1]. Some of the common complications expected after surgery include residual VSD, 1^0 heart block, right heart failure, and excessive bleeding. However, in our institute, primary repair of TOF is a routine procedure done with a low mortality rate of 0-2%. In this article, we review the outcomes of TOF in our institution following surgical correction of TOF during the years 2014 to 2018.

AIMS AND OBJECTIVES

To review the outcomes and complications following correction of tetralogy of Fallot during the years 2014-2018.

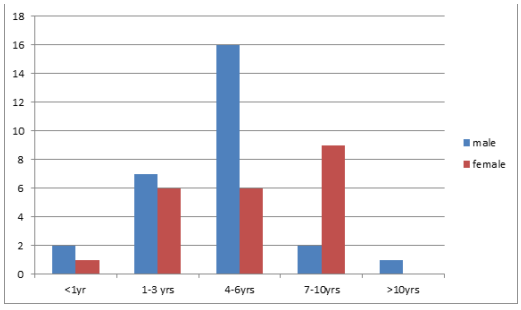
To study the spread of cases and the specific incidence rates and the age at which surgical correction was done.

MATERIALS AND METHODS

The study was conducted in the Institute of Child Health, Department of Paediatric Cardiothoracic Surgery, CHENNAI. Children who were diagnosed as Tetralogy of Fallot and underwent surgical correction for TOF from 2014 to 2018 were reviewed and their data were analyzed.

DATA

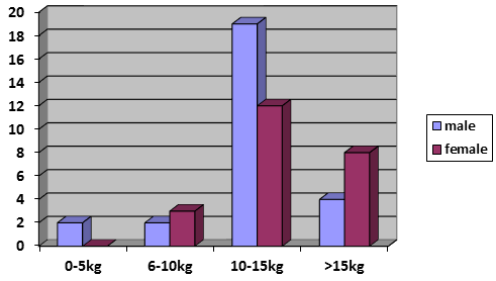
AGE AND SEX AT OPERATION



Most of the patients were operated between the age of 1year to 6years which included almost 70 % of our study population.

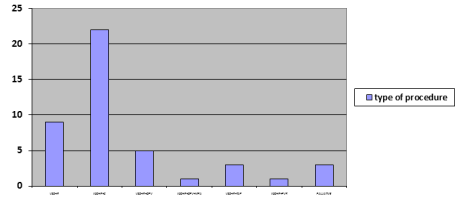
54% were male children and females were 46%

WEIGHT AT THE TIME OF OPERATION



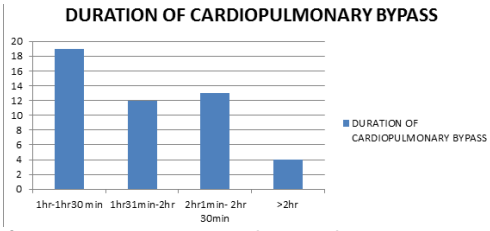
Most of the cases were within the 10-15kg zone which comprised 62% of all cases. Around 24% weighed more than 15kg.

TYPE OF PROCEDURE



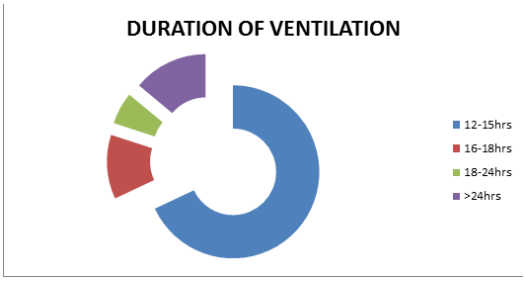
Patients diagnosed to have TOF underwent different procedures based on their presentation. VSD closure with infundibular resection with commissurotomy was done in 44%, VSD closure with infundibular resection alone in 18%, VSD closure with infundibular resection with open pulmonary valvotomy with MPA plasty in 14% and 24% of them underwent other procedures. All the patients who underwent the procedure had an adequate hegar size in pulmonary outflow tract. Three patients underwent palliative Glenn shunt.

DURATION OF CPB



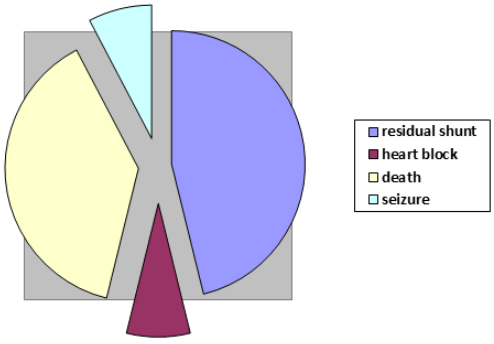
Out of 50 patients, 48 patients underwent the corrective procedure with the use of cardiopulmonary bypass and two patients underwent palliative Glenn shunt –off bypass. The initial duration of CPB during 2014 was around 2hrs -2hr 30 min. As our experience increased the duration of CPB was down to around 1hr -1hr 30 min. Patients who had a prolonged duration of CPB had significant mortality.

DURATION OF VENTILATION



Most of the patients ie., 68% were extubated within 12-15hrs following surgery. Remaining 18% of the patients were extubated within 24 hrs and 14% had ventilation for more than 24 hrs out of which 5 patients ie., around 10% were dead.

COMPLICATIONS



Out of 50 patients, 12% had a tiny residual VSD, which was hemodynamically insignificant. 5 patients were dead but most of the mortality was during initial periods of our learning curve and we have had nil mortality over the past two years. One patient (2%) developed 1st-degree heart block. Our mortality rates have fallen significantly and we have nil mortality rates now.

DISCUSSION

Primary repair of TOF is now a standard method of treatment and is safely applied to all age groups. Some patients still have surgical mortality and morbidity [2,3,4]. In our study, out of 50 patients, 54% were male children and 46% were female children. Most of the patients ie., around 86% were weighing >10 kg. On reviewing the mortality, it is noted that three out of the five deaths were in patients <10kg. This data shows that the weight of the patient at the time of surgery seems to be an important factor in predicting the outcome of the surgery. Patients diagnosed with TOF with varying anatomical variabilities were operated and most of the patients required ventricular septal defect closure with infundibular resection with or without commissurotomy. This group included around 62% of the study patients. Duration of cardiopulmonary bypass ranges from 1hr-2hrs. With our increasing experience over the past two years, CPB duration has come down to 1hr-1hr15 min. The average duration of ventilation following surgery is around 12hr to 15 hr in our study and most of them had a shorter duration of cardiopulmonary bypass and weight more than 10 kgs. This is comparable to results published by Egbe and Uppu et al [5] in 2013. Developments in postoperative care, surgical and anesthetic techniques have significantly reduced the postoperative duration of ventilation and its related complications. Our outcomes in view of complications are interesting. 12% developed a tiny residual hemodynamically insignificant shunt across the ventricular defect, and 2% had first-degree heart block which is lower when compared to the incidence reported by Batra et al., and Anderson et al., [6] who had incidence rates of around 8 and 10% respectively. With regard to mortality, we have a total mortality of 10 % and the commonest cause of death was due to low cardiac output syndrome, which is slightly higher when compared to international literature. But as our experience and technique of surgery were improving in the ongoing years, there was zero mortality following surgery during the years 2017 and 2018.

CONCLUSION

Our study is not without limitations. A retrospective design and lack of randomization were some of the drawbacks. However, on the other hand, this study demonstrates predictors of mortality and morbidity data in our institute. Age and weight at the time operation and duration of cardiopulmonary bypass were important predictors of mortality. Though our overall mortality during the study period is 10%, with improving expertise and perioperative management, our mortality over the past two years has reduced to zero and is comparable to international standards.

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