

A Study of Incidence of Congenital Cardiac Anomalies in the New-Borns with Ano-Rectal Malformation: Our Hospital Experience

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Abstract

Background: Ano-rectal malformation is a common anomaly seen in newborns and is associated with multiple anomalies like renal, vertebral, muscular and cardiac. Associated cardiac anomalies determine the morbidity and mortality of newborn. It is mandatory to properly evaluate the child for cardiac anomalies in children with ARM. **Objective:** The aim of the study is to evaluate the incidence of associated cardiac anomalies in the new-borns with Ano-rectal malformation admitted in a tertiary care centre. **Method:** Total number of Ano-rectal Malformation admitted from June 2017 to May 2018 in our hospital was recorded. All cases after examination and evaluation were classified into Low ARM and High ARM. All cases after preoperative evaluations and basic haematological tests were taken for emergency colostomy or cut back anoplasty. Patients during postoperative period were performed echocardiogram for cardiac evaluation. Total number newborns with ARM having associated cardiac anomalies were determined. The incidence of cardiac anomalies in two types of ARM was determined. **Results:** Total number of newborns with ARM admitted for surgery in the period of June 2017 to May 2018 were 182. Out of which 21 cases were having congenital cardiac anomalies (11.53%). ASD is found to be commonest cardiac anomaly comprising 15 (60%). Other cardiac anomalies associated with ARM were VSD 7 (22%), Dextrocardia 2 (8%), Tetralogy of Fallot 1 (4%). Newborns with High ARM have higher incidence of cardiac anomalies when compared to Low ARM (18/7). All cases needed extra perioperative care like antibiotic prophylaxis, avoidance of air entry through iv canula, avoidance of hypothermia and avoidance of fluid overload. **Conclusion:** The incidence of associated cardiac anomalies in newborns with ARM were found to be 11.53%. High Type of ARM have greater incidence of associated cardiac anomalies. ASD was found to be commonest cardiac anomaly. Our study showed that cardiac evaluation during preoperative evaluation should be a pre-requisite for all cases of ARMs.

Keywords: Ano Rectal Malformation; Congenital Cardiac Anomalies; Preoperative Evaluation.

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Introduction

The anomalies of gastrointestinal tract and abdominal wall are commonly encountered malformation in pediatric surgery. Among the gastrointestinal malformations, the incidence of Ano-Rectal Malformation (ARM) is a common anomaly

which varies from 2 to 2.5 per 10000 live birth [1]. There is a significant variation in the prevalence between regions throughout the world. It is not a lethal anomaly but it is frequently associated with other anomalies like cardiac, renal and vertebral which makes its management more complex. The frequency of associated anomalies with ARM range from 40-70% [2]. The associated anomalies in ARM determine

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the perioperative morbidity and mortality and hence proper evaluation of the cases is mandatory [2]. Among the anomalies associated with ARM, urogenital is the commonest followed by defects of spine, extremities, and cardiovascular system [3]. Cardiac anomalies as reported by different studies occur in 9-20% of ARM [3].

The aim of the study is to evaluate exact incidence of ano-rectal malformation and incidence of associated congenital cardiac anomalies with ARM in our Hospital during the period of June 2017-May 2018.

Material and Methods

This prospective observational study was done in the department of Pediatric Surgery, Niloufer Hospital for women and Child, Hyderabad for a period of 1 year during June 2017 – May 2018. All the New-borns admitted with ano-rectal malformation were recorded. All the cases with ARM which were admitted in the ward were examined preoperatively for any signs and symptoms of cardiac anomalies. Blood samples were sent for basic investigations and patients were prepared for surgery. Depending upon the type of ARM they are classified in to High ARM and Low ARM. A high ARM is defined as one in which anal canal ends above levatorani muscle with or without fistula [4]. A low ARM is defined as one in which the anal canal ends below the levatorani [4]. Both types were posted for

emergency surgical procedures (either Colostomy or Cut back Anoplasty).

All cases of ARM after emergency surgical procedure were evaluated for cardiac anomalies by colour doppler echocardiogram. This will help further management of secondary corrective surgical procedure which will be done after 6-8 weeks. Depending upon the echocardiogram reports, patients were grouped under those associated with cardiac anomalies and those without cardiac lesions.

A prior written informed consent was taken before performing 2D echo.

Results

Total number of patients admitted for surgery in pediatric surgical ward during the period of June 2017 to May 2018 was 3192. Out of these, the number of patients admitted with ano-rectal anomalies were 182.

Out of 182 cases of ARM, 82 (45.05%) patients had low ARM and 100 (54.94%) patients had High ARM (Table 1). In 182 patients 21 (11.5%) of ARM had associated congenital cardiac anomalies. 9 patients were having low ARM and 12 patients were with high ARM. This suggests that patients with high ARM are more commonly associated with cardiac anomalies (Table 2). The commonest cardiac anomaly which is associated with ARM was ASD. Other associated cardiac anomalies found with ARM were VSD, Dextrocardia, Tetralogy of fallot (Table 3).

Table 1: Gender distribution in ARM

Arm Type	Male	Female	Total
ARM Type I (low)	40(21.9%)	42(23.07%)	82(45.05%)
ARM Type II (high)	48(26.3%)	52(28.57%)	100(54.94%)

Table 2: Total cardiac lesions based on ARM type

Cardiac lesions	Number of patients	Percentage
Low arm with cardiac lesions	9	4.94
High arm with cardiac lesions	12	6.59
Total	21	11.53

Table 3: Types of cardiac lesions in study

Cardiac Anomaly	Incidence	Percentage
ASD	10	71.42%
ASD with PDA	3	
ASD With Dextrocardia	2	
Dextrocardia	2	9.52%
Tetralogy of Fallot	1	4.76%
VSD	3	14.28%
Total	21	

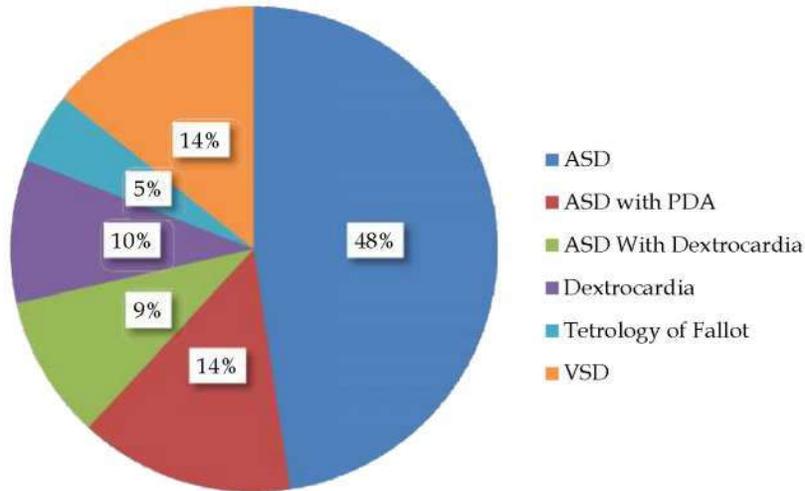


Fig. 1: Incidence of cardiac lesion in both genders

Discussion

Out of 182 children with ano-rectal malformation 100 had High ARM and 82 had Low ARM. Congenital cardiac anomalies were found to be more common with High ARM (12 out of 21 cases). The commonest cardiac anomaly which is associated with ARM is Atrial Septal Defect. There is not much of male to female preponderance. Both sexes are equally involved.

All the patients with associated cardiac anomalies had uneventful perioperative period and did not have any morbidity and mortality. The child with Tetralogy Of Fallot had postoperative elective ventilation for 1 day and after which child was extubated and discharged uneventfully. All other patients were extubated on operation table and did not have any postoperative complications.

All cases of Ano-rectal Anomalies with Congenital cardiac lesions had smooth perioperative period with some extracare and vigilance during perioperative period.

Jamal Kamal and Ahmad Azhar in an article "Congenital cardiac anomalies and imperforate anus: A hospital experience" reported 24.6% of congenital cardiac anomalies among imperforate anus patients [2].

The incidence of congenital cardiac anomalies in the newborns of Imperforate anus as reported by Olgun *et al.* is 23.7% [5]. In our study which was done in Indian population, 21 patients were associated with congenital cardiac anomalies out of 182 patients with imperforate anus (11.53%).

The lower percentage of incidence in our study could be due to "significant variations in prevalence between the regions of the world" as pointed by Jamal kamal and Ahmed Azhar".

Abadi S A, Abadi NA, *et al.* in a study in Iran reported 50.4% of congenital cardiac anomalies in newborns with imperforate anus [6].

Ghokroo R.k, Gupta K *et al.* had studied incidence of congenital heart disease in the patients with major gastrointestinal malformation in Indian population. They found 60.9% of patients with gastrointestinal abnormalities were having associated congenital heart disease [7]. Their study included Ano-rectal malformations, tracheoesophageal fistulae, omphalocele and VECTERAL. Among these gastrointestinal malformations, 60.4% have congenital heart disease. ASD is the commonest cardiac anomaly reported in their study. Our study was also done in Indian population. We found ASD is the commonest cardiac anomaly.

But the incidence of cardiac anomalies found in our study is lower (13.73%) as the study was done only in single anomaly i.e. Ano rectal Malformations. Our study did not include all gastrointestinal malformation.

Cho.S, Moore S.P, Fragman.T *et al.* in their studies on Anorectal malformations and associated anomalies in 2001 found VSD as most common cardiac anomaly [8]. In our study VSD was second commonest cardiac anomaly comprising 22%. Other associated cardiac anomalies found in our study were dextrocardia 2(8%) and Tetralogy of Fallot 1 (4%).

Teixeira OH, Malhotra K *et al.* also found VSD as commonest cardiac anomaly associated with

Anorectal malformation [9]. The incidence of congenital cardiac anomalies is found to be more in patients with high ARM when compared to those with low ARM [10].

We also found as reported by *Jamal Kamal & Ahmad Azhar et al.* that majority of cardiac anomalies were acyanotic and did not cause congestive cardiac failure and their correction was planned after correction of anal anomaly. All patients were given antibiotic prophylaxis as suggested by cardiologist and were uneventful during perioperative period. Only 1 case with Tetralogy of fallot required elective postoperative ventilation for 1 day. All other cases were extubated successfully in operation theatre. All other studies also showed same report.

Conclusion

Anorectal malformations are commonly associated with congenital cardiac anomalies. Echocardiogram should be done to all cases of Anorectal anomalies at the time of preoperative period for proper planning and management of anaesthesia. Even though majority of the cardiac anomalies are acyanotic without much cardiovascular compromise all measures to avoid the shunt reversal should be taken to reduce perioperative morbidity and mortality. It is essential to search for cardiac anomalies in a child with anorectal malformation during pre-operative evaluation.

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