

Antenatal Pediatric Surgical Counselling Clinic: Our Experience from a Tertiary Care Centre

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Abstract

Background: Congenital anomalies are major contributory factor in neonatal morbidity and mortality. Neonates with major and multiple congenital anomalies are very difficult to treat. This study was done to know the frequency, types of congenital anomalies in our antenatal follow up clinic and to increase the parent awareness, counselling for better prenatal and postnatal management.

Methods: Prospective, observational and non-interventional study with analysis of the records of all the pregnant females who visited antenatal surgical clinic in a busy tertiary care centre from 2016-2020. All the patients were counselled about the antenatally detected structural congenital anomalies and were followed up subsequently.

Results: A total of 315 antenatal females registered to our clinic. About 43% of all patients referred to us from Department of Obstetrics and Gynaecology were having fetal renal anomalies. Most common anomaly being hydronephrosis in 130 (86.6%) patients. Other renal anomalies were absent/ectopic kidney, multiple cystic kidneys, crossed fused ectopic kidney, ureterocoele etc. Central Nervous System (CNS) defects seen in the form of hydrocephalus in 20 (27%) patients, neural tube defects in form of myelocoele, meningocele and myelomeningocele in 10 (13.5%) patients, anencephaly in 1(1.3%) patient. But the most common CNS finding to be detected was choroid plexus cyst that was present in 40 (58%) patients. Cardiac anomalies were present in 70(22.2%) patients, with the most common finding of echogenic foci in heart. Other important congenital heart disease were Tetralogy of Fallot, hypoplastic left heart syndrome, Atrial septal defect (ASD) and Ventricular septal defect (VSD) etc. Other important surgically correctable anomalies were congenital diaphragmatic hernia in 10 (3.17%) patients, TEF in 1(0.31%) patient, omphalocele in 7 (2.22%), duodenal atresia in 2 (0.63%) patients and 1 (0.31%) with cleft lip and palate.

Conclusion: Early detection of fetal anomalies and referral to pediatric surgical clinic helps in proper counselling of the parents regarding prognosis and preparedness for future management, any need of antenatal intervention, to follow the outcome of anomalies, management planning during the pregnancy and early postnatal treatment in a resourceful, proper hospital setup.

Keywords: Congenital, Anomalies, Antenatal clinic, Counselling

Introduction

Congenital anomalies are defined by WHO as structural or functional anomalies, including metabolic disorders which are present at the time of birth [1,2]. Congenital anomalies

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are a significant cause of disability, chronic illness, and childhood death in many countries and affect approximately 1 in 33 infants [3]. Literature shows that 2–3% of all births are complicated by congenital anomalies and therefore, they are an important cause of perinatal morbidity and mortality [3]. Congenital anomalies account for 11% of neonatal deaths globally and 9% in India [4]. The prevalence of birth anomalies in India is 6-7% [2].

According to WHO, an estimated 2,70,358 deaths globally were attributable to congenital anomalies during the first 28 days of life in 2012, with neural tube defects being one

of the most serious anomalies [5].

Birth defects represent defective morphogenesis during early fetal life. Genetic, environmental and Maternal risk factors contribute to congenital anomalies [1]. Syndromes like Down's syndrome and Turner's syndrome have underlying genetic defects whereas neural tube defects and other musculoskeletal anomalies have a sporadic incidence and are associated with environmental exposures and nutritional deficiencies [1].

Most common nutritional deficiency in Indian pregnant women are iron, folic acid and zinc deficiency. Folic acid and zinc deficiency are associated with neural tube defects [6]. Other factors responsible for congenital anomalies are perinatal infection, drug exposure, radiation exposure and systemic diseases like diabetes, autoimmune diseases [6].

In a study conducted in South Africa, congenital anomalies were regarded a 'silent epidemic'. In this study, it was noted that only 26.2% of severe congenital anomalies were diagnosed at birth [2]. Therefore, it is necessary to include suitable prenatal, family planning and pediatric facilities into the primary health care delivery system to manage these problems.

Methods

This study has been conducted in a tertiary care centre, from June 2015 to December 2020 and all the antenatal females that were referred for antenatal USG finding, were registered in antenatal surgical clinic. These patients were counselled through verbal communication regarding the anomaly, explaining the prognosis, possible outcomes and

treatment plan and also long-term implications of the disease as well as treatment. The patients were then followed up throughout the pregnancy and institutional delivery in a hospital with pediatric surgical and neonatology team was advised.

The babies were then either taken up for surgery immediately after birth or followed up and electively managed based on indication.

Results

Over a period of four and half years, total 315 mothers with antenatally detected structural congenital anomalies in fetus were seen and registered in antenatal surgical clinic. In our study, renal anomalies (150/315) were the most common congenital anomalies detected in antenatal sonography, central nervous system (CNS) anomalies were present in 74 cases, cardiac disease were seen in 70 cases, thoracic anomalies in 11 cases, gastrointestinal tract (GIT) anomalies in 9 and cleft lip and palate in one case (Table 1).

In one hundred and fifty pregnant females, renal anomalies were detected on antenatal scan. Among the renal anomalies, hydronephrosis was the commonest anomaly which was present in 130 cases. Unilateral hydronephrosis was present in 105 and bilateral hydronephrosis was seen in 25 cases. In two cases, fetus had bilateral hydroureteronephrosis and 8 fetuses had unilateral hydroureteronephrosis. Multicystic dysplastic kidney was found in 5 cases, one pregnant female was diagnosed with horse shoe kidney in fetus, ureterocoele was seen in one case and three mothers had fetus with single kidney (Table -2).

Table 1: System wise distribution of anomalies

Systemic anomalies	Number of patients (n=315) n(%)
RENAL	150(47.6)
CNS	74(23.4)
CARDIAC	70(22.2)
THORACIC	11(3.4)
GIT	9(2.8)
MISCELLANEOUS	1(0.3)

Table 2: Distribution of antenatally detected renal anomalies

Renal anomalies	Number of patients (n= 150) n(%)
Hydronephrosis	130* (86.6%)
Hydroureteronephrosis	10# (6.6%)
Multicystic Dysplastic Kidney	5 (3.3%)
Single Kidney	3 (2%)
Horse shoe kidney	1 (0.6%)
Ureterocoele	1 (0.6%)

*Unilateral – 105, Bilateral – 25; #Unilateral – 8, Bilateral - 2

Among 150 unilateral hydronephrosis, only 95 patients followed up in our OPD and rest 20 patients were lost to follow up. Among them hydronephrosis resolved spontaneously in 72 patients, 14 patients were on conservative treatment and on regular follow up and surgical management was done in 9 patients only.

Among 25 bilateral hydronephrosis, postnatal USG in 5 patients showed unilateral hydronephrosis, 2 patients were on conservative treatment for bilateral hydronephrosis with regular follow-up and 18 patients showed spontaneous resolution. Out of 8 unilateral hydroureteronephrosis, two patients had primary VUR and 6 patients had hydronephrosis who were on conservative treatment and both patients with bilateral hydroureteronephrosis had PUV and cystoscopic valve fulguration was done within 1 month of age. Rest patients were managed conservatively and on regular follow up.

Second most common anomaly found was fetal CNS anomalies i.e., in 74 pregnant females. Among CNS anomalies, choroid plexus cyst was the most common anomaly which was seen in 43 cases, hydrocephalus was seen in 20 and neural tube defects was present in 10 cases and in one mother; antenatal scan detected anencephaly in fetus (Table 3).

Since all mothers presented in mid trimester, prognosis was explained to the parents. Only 55 patients followed up to our OPD and others were lost to follow up. Patients with hydrocephalus were referred to neurosurgeon. Only 5 patients with MMC reported to us postnatally and operated. Reassurance was given to the parents of patients with choroid plexus cyst.

Third most common anomaly seen was cardiac anomalies which was detected in 70 cases. Cardiac echogenic foci were seen in 56 cases, 10 had septal defects, 2 had hypoplastic left heart syndrome and 2 had Tetralogy of Fallot (Table 4).

All patients with cardiac anomalies were referred to the CTVS department for further evaluation and management. Congenital diaphragmatic hernia was detected on antenatal

scan in 10 fetuses. Other detected anomalies were tracheo-oesophageal fistula in one, omphalocele in seven, duodenal atresia in two and cleft lip and palate in one case.

Neonatal surgical emergency like TEF, omphalocele and duodenal atresia were operated immediately after birth, patient with cleft lip and palate were referred to the plastic surgeon. Out of 10 antenatally detected CDH, only 8 reported to us and among them all were operated within one month of age.

Discussion

Pregnant females who are antenatally detected with fetal congenital anomalies need to be referred to pediatric surgeons for prognostication of disease. Antenatal findings, such as gestational age at diagnosis and progression or regression of abnormality, affects the prognosis of a disease [7].

Earlier, 'The Medical Termination of Pregnancy Act' of 1971 of India allowed termination of pregnancy with minimal risk to the mother for fetuses with anomalies and less than 20 weeks gestational age. The Medical Termination of Pregnancy (Amendment) Bill, 2020 was introduced on March 2, 2020 and passed on March 17, 2020. It amends the Act to increase the upper limit for termination from 20 to 24 weeks for certain categories of women, removes this limit in the case of substantial foetal abnormalities, and constitutes Medical Boards at the state-level.

In our study, all patients presented in mid-trimester of pregnancy as anomaly scan is done at gestation age 16 to 20 weeks. So, till March 2020, no pregnant mother could be counselled for abortion while after amendment act, no patient requiring abortion presented to our clinic.

In the United Kingdom, under exceptional circumstances, termination of pregnancy is allowed till 24 weeks of gestation [8].

While the period of viability is becoming lesser and lesser, the quality of life of the patient in future should be

Table 3: Distribution of central nervous system anomalies

CNS anomalies	Number of patients (n=74) N(%)
Choroid plexus cyst	43(58%)
Hydrocephalus	20(27%)
Spinal tube defects	10(13.5%)
Anencephaly	1(1.3%)

Table 4: Distribution of cardiac anomalies

Cardiac anomalies	Number of patients (n=70) N(%)
Echogenic Foci	56(80%)
Septal Defects	10(14.2%)
Hypoplastic left Heart Syndrome	2(2.8%)
Tetralogy of Fallot	2(2.8%)

considered. Furthermore, India not only accounts for one-fifth of global live births but also has a high number of neonatal deaths [9,10].

As per the World Health Organization, the neonatal mortality rate in India in 2015 was 28 per 1000 live births. Four major causes of neonatal deaths as per the data from the Million Death Study from India were preterm birth complications (44%), infections (20%), perinatal asphyxia (18%), and congenital malformations (8%) [10]. In comparison to developed countries, where the leading cause of infant mortality is congenital malformations, in India, low birth weight, prematurity, and infections continue to be the leading cause [11]. As a consequence, congenital disabilities continue to receive less attention [12].

This also proves necessity of paediatric surgical antenatal clinic in low resource country like India so that parents can make informed decision and can better take care during antenatal and postnatal period in terms of mode of delivery, place of delivery, need of immediate or elective surgery or follow up.

A recent study by Saini *et al.* in a district hospital in India reported preterm morbidity and mortality of 100% and 85%, respectively, for neonates born before 28 weeks of gestation [13]. Therefore, even if a fetus with an anomaly requiring surgical intervention is delivered early, chances of survival are poor. Therefore, need of proper referral to a tertiary care centre with proper obstetric, neonatology, anaesthetic and paediatric surgical facilities is emphasised.

Gandhi *et al.* also reported a statistically significant association between congenital anomalies and low birth weight and prematurity [14]. Sarkar *et al.* in their study demonstrated a significant correlation between congenital defects and the need for a caesarean section as a mode of delivery [15]. This has further added to the morbidity of the mother.

The study by Mallik *et al.* highlights the need for cautious antenatal counselling combined with an assurance to prospective parents that postnatal investigations will be performed in a stepwise manner based on the initial postnatal ultrasound scan and clinical findings [16].

A study by Sung and Kim on fetal urinary tract anomalies was done over a period of 4.5 years with 5442 fetuses. The incidence of all types of anomaly was 4.3% and the incidence of urinary tract anomaly was 0.9% of all babies born and 20.3% of entire anomaly. Types of urinary tract anomaly were as follows: hydronephrosis (37 cases), multicystic dysplastic kidney (5 cases), polycystic kidney disease (2 cases), renal agenesis (2 cases), ectopic kidney (1 case) and hypoplastic kidney (1 case). Associated anomalies were found in 8 cases (16.7%) among 48. Causes of hydronephrosis were ureteropelvic obstruction in 13

cases, ureterovesical obstruction in 4 cases, vesicoureteral reflux in 2 cases, proximal ureteral obstruction in 2 cases, and no specific causes in 16 cases [17].

In some studies, central nervous system is most commonly involved [18,19]. but in our study genitourinary system affected most. Second most common system involved in our study was central nervous system, these findings are similar to other studies in literature [20-23].

Chew *et al.* in their population-based study of antenatal detection of congenital heart disease by ultrasound examination observed that the overall birth prevalence of CHD from 1993 to 2002 in Victoria was 7.8/1000. The antenatal detection rate for the seven selected defects from 1999 to 2002 was 52.8%. All but 4.8% of the cases had an ultrasound examination at > 13 weeks' gestation. Antenatal detection was highest for hypoplastic left heart syndrome (84.6%) and lowest for simple TGA (17.0%) [24].

Conclusion

Prenatal counselling for congenital anomalies is an essential component of pediatric surgical practice and should be ensured in training programme. Care of patients with congenital anomalies should be planned prenatally with the joint effort of obstetricians, geneticists, neonatologists and paediatric surgeons. Surgically correctable lesions are mostly dealt after delivery in an appropriate centre for better outcome.

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