ORIGINAL ARTICLE

Incidence and Types of Congenital Abnormalities Detected on Antenatal Ultrasound Examination in Lady Willingdon Hospital, Lahore

YAHYA MALIK

ABSTRACT

Aim: To determine the incidence and types of congenital abnormalities detected on antenatal ultrasound examination in Lady Willingdon Hospital, Lahore.
Methods: This study was performed in ultrasound department of LWH from 4th August 2004 to 31st December 2011
Results: 1794 congenitally abnormal fetuses were diagnosed. Among the 1794 cases listed in this study, a very high percentage (65.99%) involved CNS. This is followed mainly by involvement of urinary system (10.51%) and GIT involvement (9.41%).
Conclusion: Counseling regarding completion of family at an earlier age, cousin marriages, avoidance of certain environmental hazards, having serial antenatal ultrasound examinations and food and dietary supplementation may help to reduce the incidence of congenital abnormalities in a significant way
Keywords: Incidence, congenital abnormalities, antenatal ultrasound examination

INTRODUCTION

WHO defines birth defects or congenital anomalies as "structural, functional and / or biochemical-molecular defects present at birth whether detected at that time or not". Among different categories of congenital anomalies, congenital abnormalities i.e. structural and morphological defects represent the largest category[1]. There are many ways to detect such fetuses and antenatal ultrasound examination being one of them[2,3]. Antenatal ultrasound examinations are easily available, are cheap and cost effective. If done serially during pregnancy can detect major congenital abnormalities with high degree of accuracy and confidence. The accuracy rate further increases if this examination is performed in a tertiary care hospitals with trained sonologists[4,5]. Present study was undertaken to determine the incidence and types of congenital anomalies detected on antenatal ultrasound exam in Lady Willingdon Hospital, Lahore.

MATERIALS AND METHODS

This study was performed in ultrasound department of LWH from 4th August 2004 to 31st December 2011. LWH is 235 bedded dedicated gynae / obs teaching hospital affiliated with King Edward Medical College / University, Lahore. On Average 28-30,000 patients are being examined in ultrasound department of this hospital per year. This number can roughly be divided equally between gynae / obs patients.

Department of Radiology, Lady Willingdon Hospital, Lahore
Correspondence to Dr. Yahya Malik

Every obstetrical patient coming to this department is subjected to routine obstetrical antenatal ultrasound examination which includes determination of number of fetuses, biometry, evaluation of gestational age and evaluation of placenta and amount of liquor etc.

Every fetus with suspicion of having some congenital abnormality is subjected to detailed scrutiny. Every body system of such fetus is examined in detail. Each such fetus is examined in multiple sagittal planes and at least six cross sectional images are also obtained[6].Spine remains special focus of interest in any fetus having neural tube defect and in such cases, as far as possible, each vertebra is examined in both sagittal and axial planes.

During this study, each congenitally abnormal fetus was first examined by the author and then was examined by another colleague who in most of the cases was senior consultant radiologist. Comprehensive report was issued to every patient detailing the nature and the extent of abnormality (ies). During this period, 1794 congenitally abnormal fetuses were diagnosed on antenatal ultrasound examination. Most of these pregnant ladies were having their first antenatal ultrasound examination in our department and in this study; they were recorded as OPD patients. A small percentage of patients was those who came to our department having an anomalous fetus diagnosed from somewhere else and they were also recorded as OPD patients. Still there was another small percentage of patients who

were referred from our in-patient departments. These were the patients in whom congenital abnormality had already been detected from outside scan and these patients were referred to our department for confirmation of anomaly. In this study, these patients were recorded as in door patients.

As soon as a congenitally abnormal fetus was diagnosed, patient's data was recorded. That included date of examination, registration number, unit from which the patient was referred, place of referral (OPD/Indoor). This record also included name and age of patient, as far as possible complete address of the patient and obstetrical history (duration of marriage, gravidity, parity). Exact relationship bride with her husband (consanguinity, if any), history of any congenitally abnormal fetus in previous pregnancies and history of any anomalous fetus in near relatives especially in real sisters of bride was also recorded. For every congenitally abnormal fetus, at least one referral ultrasound image was obtained. A fetus with more than one abnormalities or with multiple abnormalities was counted once only based on the primary / most conspicuous abnormality[7].

During this study, no information was obtained from obstetrical data base, birth registers, congenital anomaly registers and post mortem reports etc. Data was analyzed on software based on Microsoft Access system.

RESULTS

Table shows a long list of congenital abnormalities noted during this study. Abnormalities involving central nervous system 1176(65.99%), urinary system 190(10.51%), GIT 170(9.41%), musculo-skeletal system 109(6.06%), neck and chest 100(5.52%) and misc 49(2.71%) were noted. Involvement of central nervous system heads the list in which hydrocephalus / ventriculomegaly is the forerunner.

For unknown reasons, there is sharp decline in the number of cases from CNS to urinary tract. From there, the incidence of abnormalities involving various systems declines but on a steady rate (Figure). In descending order of frequency, similar results were noted in another study performed in Pakistan which was also based on antenatal ultrasound examination

In that study figures for two most commonly involved systems were CNS (57.50%) and urinary system (13.40%)[8]. Serial ultrasound examinations (2nd. and 3rd. trimester) are usually advised for diagnosing urinary tract anomalies. Antenatal ultrasound examination during third trimester is being suggested to detect urinary tract anomalies especially in cases where renal pelvis dilatation of more than 10 mm or transverse imaging was detected at 2o weeks scan.

Anomalies	n & (%)
Hydrocephalus alone and associated anomalies	589 (32.83)
Anencephaly alone and associated anomalies	258(14.38)
Exencephaly alone and associated anomalies	124 (6.91)
Microcephaly alone and associated anomalies	49 (2.73)
Holoprosencephaly alone and associated anomalies	37 (2.06)
Posterior encephalocele alone and associated anomalies	59 (2.38)
Anterior encephalocele alone and associated anomalies	3 (0.16)
Porencephalic cyst of brain	1 (0.05)
Posterior cranial fossa cyst	4 (0.22)
Meninigocele alone and associated anomalies	14 (1.28)
Meckel Gruber Syndrome and associated anomalies	9 (0.50)
Dandy Walker alone and associated anomalies	8 (0.44)
Cerebellar problems alone and associated anomalies	7 (0.39)
Choroid plexus cyst alone and associatedanomalies	7 (0.39)
Enlarged cisterna magna alone and associated anomalies	2 (0.11)
Brain tumor /mass alone and associated anomalies	2 (0.11)
Dilated subarachnoid space	1(0.05)
Aneurysmal dilatation of cerebral vessel	1 (0.05)
Choroid plexus papilloma	1 (0.05)
al CNS anomalies	1176 (66%)
Reduced intra-ocular distance	1 (0.05)
Cystic hygroma alone and associated anomalies	50 (2.78)
Cervical teratoma alone and associated anomalies	7 (0.39)
Enlarged lungs with trachea-bronchial obstruction and CAM III	5 (0.27)
Adenomatoid malformation alone and associated anomalies	2 (0.11)
Cyst in chest alone and associated anomalies	**3** (0.16)
Small chest alone and associatedanomalies	2 (0.11)
Mass lateral chest wall	2 (0.11)
Hydrothorax	2 (0.11)
Cardiomegaly alone and associated anomalies	6 ()
Single atrium alone and associated anomalies	6 ()
Enlarged atria alone and associated anomalies	2 (0.11)
Small left ventricle alone and associated anomalies	2 (0.11)
Some cardiac anomaly, ascities and effusion	10 (0.55)
al neck and chest anomalies	100 (5.52)
Gastroschiasis alone and associated anomalies	13 (0.72)
Absent stomach bubble alone and associated anomalies	48 (2.67)
Mesenteric / ovarian cyst alone and associated anomalies	46 (2.56)
Omphalocele alone and associated anomalies	18 (1.0)
Congenital diaphragmatic hernia alone and associated anomalies	19 (1.05)
Duodenal atresia alone and associated anomalies	18 (1.0)
Hepatic haemangioma	1 (0.05)
Hepatomegaly	1 (0.05)
Meconeum cyst	1 (0.05)
Persistent cloaca	1 (0.05)
Dilated bowel loops and ascities	3 (0.16)
Choledochal cyst	1 (0.05)
al GIT anomalies	170 (9.41)
Dysplastic kidneys alone and associated anomalies	62 (3.45)
Hydronephrosis alone and associated anomalies	39 (2.17)

Polycystic kidneys alone and associated anomalies	28 (1.56)
Posterior urethral valves alone and associated anomalies	17 (0.94)
Renal agenesis alone and associated anomalies	14 (0.78)
PUJ obstruction alone and associated anomalies	13 (0.72)
Renal cysts alone and associated anomalies	10 (0.55)
Vesico-ureteric obstruction	5 (0.27)
Dilated calyceal system	2 (0.11)
al Urinary System anomalies	190 (10.51)
Small long bones and associated anomalies	72 (4.01)
Thonatophoric dwarfism alone and associated anomalies	23 (1.28)
Absent long bones	2 (0.11)
Deformed spine alone and associated anomalies	12 (0.66)
al Musculo-skeletal anomalies	109 (6.06)
Ascities alone and associated anomalies	27 (1.50)
Hydrops fetalis	13 (0.72)
Absent diaphragm alone and associated anomalies	3 (0.16)
Sacral teratoma	4 (0.22)
Conjoint twins	2 (0.11)
al Misc. anomalies	49 (2.71)

DISCUSSION

Congenital anomalies are important causes of perinatal morbidity and mortality. Survivors may be mentally and physically disable. Psychological trauma to the parents, family and cost associated with the treatment may be unbearable in countries like Pakistan where social support system is virtually nonexistent.

Serial antenatal ultrasound examinations (at least three) are effective and cost effective methods to diagnose such a problem. Once a major congenital anomaly has been diagnosed, counseling of parents can be done, further may be planned which may be in the form of termination of pregnancy.

Based on different studies and surveys, a pattern in which congenital abnormalities occur in a specific area , population, some remedial measures like completion of family at an earlier age, counseling about cousin marriages especially if there is a history of giving births to congenitally abnormal fetuses in close relatives and folic acid supplementation on mass scale may be recommended.

REFERENCE

1. Iirth defects are preventable. Czeizel AE. Int. Journal of Med.Sci.2005, 2(3), PP 91-92.
2. The Accuracy of ultrasound in the diagnosis of congenital anomalies. Shama Munim et al. J. Pak Med Assoc. Jan 2006;56(1):PP16-18
3. Antenatal ultrasound screening for fetal abnormalities: a systematic review of studies of cost and cost effectiveness. Tracy Roberts et al. British Journal of Obstetrics and Gynaecology. January 2002,Vol109,PP44-56
4. First trimester ultrasonographic diagnosis of fetal structural abnormalities in a low risk population. Economides et al.BJOG,Vol105,Issue 1,January 1998,PP 53-57
5. Effectiveness of routine Ultrasonography in detecting fetal structural abnormalities in a low risk population. Lyn S Chitty et all.BMJ, 1991, November 9 303(6811) PP 1165-1169.
6. Sectional Fetal Anatomy in Ultrasound.Alf Staudach. Springer-Verlag. ISBN 3-540-18213-6. PP 32-33
7. Prevalence and secular trend of congenital anomalies in Glasgow UK. Stone DH et al. Arch Dis Child 2002,86,257-263
8. Congenital fetal anomalies, Antenatal ultrasound detection. Muhammad Nafees et al. Pakistan Armed Forces Medical Journal, 2006,3,September.