THE AGA KHAN HOSPITAL FOR WOMEN & CHILDREN KHARADAR
RADIOLOGY DEPARTMENT

"CHANGING TRENDS IN ANTENATAL & POST NATAL CRANIAL SONOGRAPHY IN FETUS & PAEDIATRIC NEUROLOGY"

OBJECTIVE:
Cranial Sonography can cause changing trends in fetus & Pediatrics Neurology by early detection of Brain anomalies.

INTRODUCTION & LITERATURE REVIEW:
Congenital malformations affect approximately 2-3% of all live births every year[1] , Central nervous system anomalies are the second most frequent serious congenital anomaly, after congenital heart disease, up to 75 % of fetal deaths and 40% of deaths in infancy are due to Central nervous system malformation (Barkovich, 2005). Furthermore, one third of all Congenital malformations identified in the perinatal period arise from the Central nervous system anomalies,Which evident at birth, but some Central nervous system malformation may not be immediately obvious. The neonates with dysmorphic feature or abnormal neurological behaviour may suggest Central nervous system malformation. Central nervous system anomalies, whether they are isolated (single)or part of syndromes, are a common cause of medical intervention, long-term illness, and death. The neonatologist or perinatologist often is the first person to identify necessary evaluations and management and to explain the cause of the anomalies and the prognosis for the child to the parents.[2] Central Nervous System Anomalies are a heterogeneous disease for which genetic, infectious, teratogenic and neoplastic causes have been implicated (Bendon, 1987; Barkovich et al, 2005). Brain development begins shortly after conception and continues throughout the growth of a fetus & continuously till second decade of life . A complex genetic program coordinates the formation, growth, and migration of billions of neurons, or nerve cells, and their development into discrete, interacting brain regions. [3,4,5,6,7].

METHODOLOGY:
Retrospective analytic study was conducted during 1st July 2012 to 30th June, 2014 at AKHWCK AND Data was collected from Patient record Register [PRR], Radiology Information System[RIS] & Medical Record Files[MR]

SONOGRAPHY CRITERIA:
The appearance of the brain and spine changes throughout gestation. Neuroscan at b/w 11 to 13 weeks for Nuchal Translucency & detail Central Nervous System Anomalies are diagnosed at B/W 20-22 weeks .In late gestation, visualization of the intracranial structures is frequently hampered by the ossification of the calvarium.

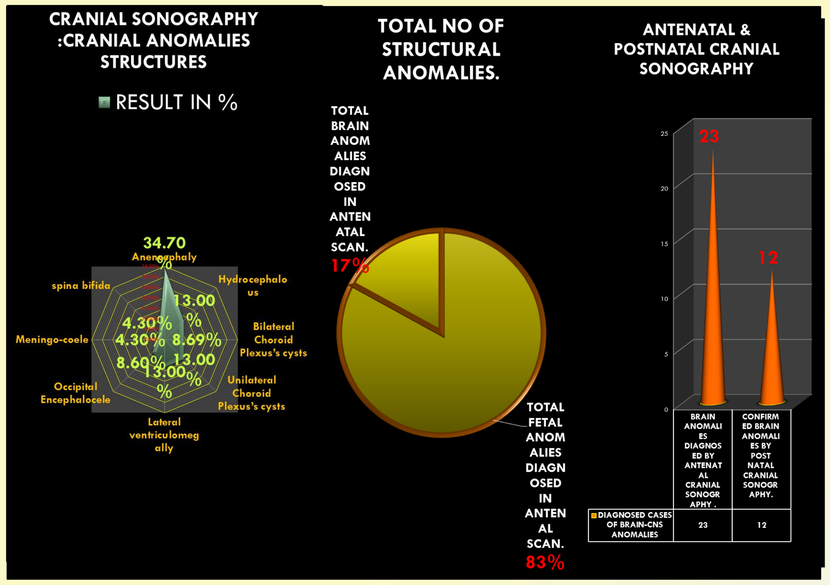
RESULT :
Two thousand & eighty nine {2089} [100%] Patients have examined during two years.
One hundred & twelve {112}[112/2089x100=5.361%] cases of fetal anomalies were observed, in which brain anomalies were only Twenty Three {23} i.e 1.10% [23/2089x100=1.10% or 23/112x100=20.53] in this Study.
Fetuses have different kind of brain anomalies [which were diagnosed by Antenatal Cranial Sonography fetuses diagnosed different kind of brain anomalies/antenatal Fetal anomalies [Antenatal Cranial Sonography][,includes Eight cases of Anencephalic-Head, Three cases of Hydrocephalous, two cases of bilateral-*choroid-plexus-cysts*, Three cases of unilateral- *choroid-plexus-cysts*, Three cases of lateral-ventriculo-megally, Two cases of Occipital-encephalo-coele, one case of Meningo-coele & one case of Spinabifida.
Only twelve [neonatal Cranial Scan] Post-natal Cranial Sonography were done for confirmation of antenatal scan finding, while other fetuses of Congenital Brain anomalies were terminated the Pregnancy [Termination of pregnancy], Few were refused for Post-natal Cranial Sonography & Many Congenital Brain anomalies fetuses were referred to Secondary Care Hospital for Management.

KEY WORDS:
Patient record Register: PRR, Radiology Information System: RIS & Medical Record Files :MR, Congenital Malformations[CM], Central Nervous System Anomalies(CNS-A) , Nuchal Translucency :NT & Central nervous system malformation(CNSM.)

REFERENCES :

1:(Whiteman et al, 1994; Atlas et al, 1985).
2: Ultrasound Diagnosis of Congenital Brain Anomalies Brankica Vasiljevic1, Miroslava Gojnic1 and Svjetlana Maglajnlic-Djukic2 1Institute of Gynecology and Obstetrics – Clinical Centre of Serbia, 2University Children's Hospital, Belgrade, Serbia].
3:Moore, Keith L., et al. Before We Are Born: Essentials of Embryology and Birth Defects. Kent, UK: Elsevier— Health Sciences Division, 2002.
4:"Congenital Birth Defects." Dr. Joseph F. Smith Medical Library. Available online at http://www.chclibrary.org/micromed/00043570.html (accessed December 8, 2004).
5:"Congenital Birth Defects." Principal Health News. Available online at ttp://www.principalhealthnews.com/topic/topic100586649 (accessed December 8, 2004). Richard Robinson Deborah L. Nurmi, MS
6: Johnson SP, Sebire NJ, Snijders RJ, Tunkel S, Nicolaides KH. Ultrasound screening for anencephaly at 10–14 weeks of gestation. Ultrasound Obstet Gynecol 1997; 9: 14–16.

RESULT PRESENTED WITH GRAPHS



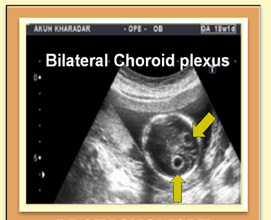
Researcher and Presenter : Dr Mumtaz Malik
Team of Radiology Department : Maria, Sunita, Khatidja, Shermeen Nusrat, Rashid Mughal & Dr. Taseer .

Acknowledgement: Safdar Kagazwala , irfan.valliani Amin Makhani & Alidino Khowaja.

ANTENATL CRANIAL ULTRASOUND IMAGING :

BRAIN ANOMALY
ANENCEPHALY

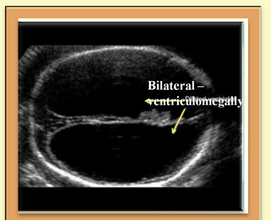
BRAIN ANOMALY
BRAIN TISSUE WITHOUT SKULL



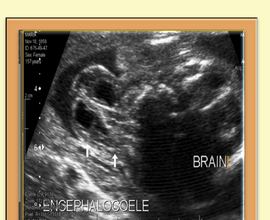
BRAIN ANOMALY
CHOROID PLEXUS CYSTS


BRAIN ANOMALY
UNILATERAL VENTRICULOMEGALLY

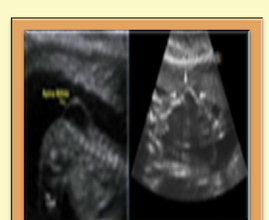
BRAIN ANOMALY
ARACHNOID CYST

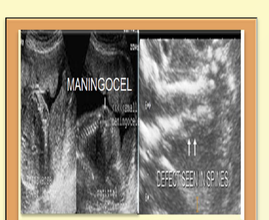


BRAIN ANOMALY
HYDROCEPHALOUS



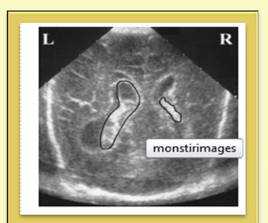
SPINE ANOMALY
ENCEPHALOCOELE


SPINE ANOMALY
SPINA BIFIDA & KHYPHOSIS

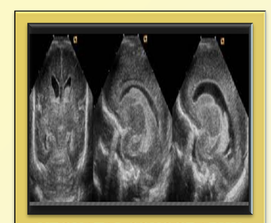


SPINE ANOMALY
MENINGOCOELE

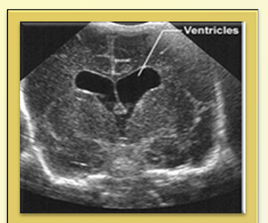
PAEDIATRIC NEUROLOGY IMAGING



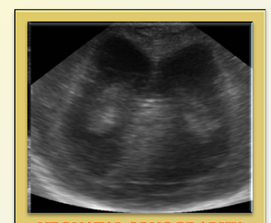
NEONATAL SONOGRAPHY
HEMORRHAGE IN THE LEFT VENTRICLE

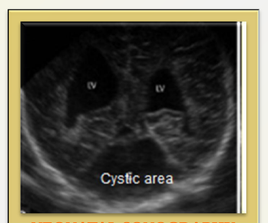

NEONATAL SONOGRAPHY
HEMORRHAGE IN THE LEFT VENTRICLE


NEONATAL SONOGRAPHY
CHOROID PLEXUS CYST

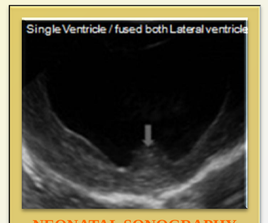


NEONATAL SONOGRAPHY
Hydrocephalous seen in Infant

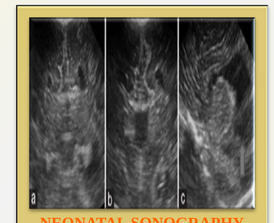

NEONATAL SONOGRAPHY
Hydrocephaly in infant

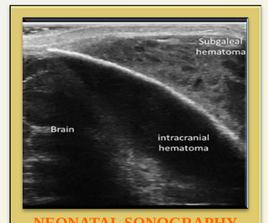


NEONATAL SONOGRAPHY
A cystic lesion seen in posterior fossa with bilateral dilated lateral ventricles[Dandy walker Malformation]



NEONATAL SONOGRAPHY
A Lobar Holoprosencephaly [Single Holo-ventricle]]


NEONATAL SONOGRAPHY
Corpus callosum agenesis.



NEONATAL SONOGRAPHY
Intra Cranial Hematoma.

Table #1:
The Ratio of Diagnosed BRAIN [CNS & spinal]Anomalies in fetuses by Antenatal Ultrasound Examination is 1.10 % [23/2089]

Result	Total no of antenatal scan were done.	Total Diagnosed fetal Anomalies cases by antenatal ultrasound scan	Total Diagnosed fetal Brain & spines anomalies cases by antenatal ultrasound scan
Result in Total Number	2089	112	23
Result in Percentage	100%	5.361 %	1.10%

Table # 2:
Diagnosed Fetal Brain & Spines [CNS] structural anomalies during Antenatal scan.

S N	Fetal[CNS]Brain & Spines anomalies in antenatal Cranial Sonography.	Different type of Brain & Spines anomalies.	Result in %
1	Anencephaly	8	8/23x100=34.7%
2	Hydrocephalous	3	3/23x100=13.0%
3	Bilateral Choroid Plexus's cysts	2	2/23x100=8.69%
4	Unilateral Choroid Plexus's cysts	3	3/23x10013.0%
5	Lateral ventriculomegally	3	3/23x100=13.0%
6	Occipital Encephalocele	2	2/23x100=8.6%
7	Meningo-coele	1	1/23x100=4.3%
8	spina bifida	1	1/23x100=4.3%
TOTAL	ALL	23	100%