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PREGNANT WOMAN WITH ACHONDROPLASIA- A CASE REPORT

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ABSTRACT

Achondroplasia is the most common cause of short stature. It is diagnosed based on physical examination, radiology and confirmed with molecular testing. They are at increased risk of certain cardiopulmonary complications and they potentially require cesarean section for delivering the baby. The fertility rate of women with achondroplasia is usually low; thus, there is little evidence about the optimal management of pregnant women with achondroplasia. We report a case of pregnant woman with Anchondroplasia, who was managed successfully with interdisciplinary coordination.

INTRODUCTION

The term Achondroplasia meaning "without cartilage formation" was first used in 1878 to distinguish this condition from rickets[1]. This is the most common skeletal dysplasia and is the most common form of dwarfism with a prevalence of 1 in 20,000 live births.[2] It is inherited in an autosomal dominant fashion, but approximately 80% of cases are the result of new (de novo) mutations. Its pathology is due to a gain-of-function mutation in Fibroblast Growth Factor Receptor 3 (FGFR3), gene on the distal short arm of chromosome 4. This mutation permanently activates the FGFR3 receptor, inhibiting chondrocyte proliferation, which ultimately leads to impaired endochondral bone formation, growth restriction, bone shortening, and other skeletal anomalies[3,4]. The diagnosis of achondroplasia is based upon clinical and radiographic findings but confirmed by molecular testing.

An affected individual who has a reproductive partner with average stature is at 50% risk in each pregnancy of having a child with achondroplasia. When both parents have achondroplasia, the risk to their offspring of having average stature is 25%; of having achondroplasia is 50%; and of having homozygous achondroplasia (a lethal condition) is 25%.[4,]

Case Report :-

A 25 year old dwarf primigravida attended antenatal OPD at 34 weeks gestation. As she had thoracolumbar kyphoscoliosis also, she was admitted for evaluation of cardiorespiratory status and for safe delivery. She was born out of non-consanguineous marriage. She was identified as a dwarf after her sixth year of age. Her pubertal milestones were normal except the growth spurt. The height attained by her is 134cm as measured at admission. She conceived 3 years after marriage, following treatment for oligomenorrheic cycles. Her husband is of average height and this was not a consanguineous marriage. She had regular antenatal check ups in primary health centre till 34 weeks of gestation. Evaluation from obstetric point of view was normal including antenatal ultrasound examination.

The fetal growth centile including biparietal diameter and length of long bones were appropriate for the gestational age. Maternal 2D echocardiogram and pulmonary function tests were unremarkable. She was taken up for elective cesarean section at 38 weeks of gestation, under general anesthesia in view of contracted pelvis.. She gave birth to a live born male baby weighing with no signs of Achondroplasia. Mother and baby were discharged on eight postoperative day uneventfully. As our patient is a case of achondroplasia with de novo mutation, the couple were counseled that she has 50% chance of giving birth to normal offspring in every pregnancy. They were also offered contraceptive advice at six weeks postpartum.

DISCUSSION:-

Once the FGFR3 pathogenic variant has been identified in the affected parent or parents, prenatal testing for a pregnancy at increased risk and preimplantation genetic diagnosis are possible.[5] Homozygous condition for the said disorder is lethal due to restrictive pulmonary disease and craniocervical junction constriction.[6,7] In heterozygotic inheritance, intelligence and life expectancy are normal. Respiratory limitations due to small thorax and development of stenotic vertebral canal (peripheral neurologic deficits) may decrease the quality of life. But most of the cases result from new mutation. They are suspected if the antenatal ultrasound shows : Short limbs, short hands and fingers, large head with frontal bossing and depressed nasal bridge, and lumbar scoliosis. Limb shortening and typical facial features become apparent >22 weeks' gestation. The diagnosis can be made by invasive testing or , non-invasive procedures like Next Generation Sequencing (NGS) using circulating fetal DNA (cf-DNA) in maternal plasma. NGS can accurately detect fetal achondroplasia, as well as other autosomal dominant mutations, without having an invasive procedure.[8]The denovo cases are heterozygotic and need follow-up scans every 4 weeks to monitor growth of the fetal head. Risk of recurrence is 50% with one affected parent. If both parents are affected, there is 50% risk of heterozygous achondroplasia, 25% risk of homozygous condition and 25% chance of unaffected child. There is low risk of recurrence if it is a de novo mutation.

Complications and concerns in pregnant women with Achondroplasia:

Kyphoscoliosis, as well as a small thoracic cage, lead to reduced lung capacity in these patients. Expansion of the thoracic circumference is further limited by the enlarged uterus of pregnancy. All of these factors together may result in respiratory distress during the third trimester, possibly requiring early delivery. Chances of fetal hypoxemia and preterm delivery also increase. For these reasons, a consultation with a pulmonologist is recommended in early pregnancy to avoid respiratory complications.

In a pregnant patient with Achondroplasia, cesarean delivery is required because of foreseeable dystocia due to cephalopelvic disproportion.[8]When the prenatal diagnosis of achondroplasia is made in a fetus of non-affected parents, consideration should be given to cesarean section. The reason for this is that the large head of achondroplasia might not fit easily through the normal sized pelvis, potentially leading to intracranial bleeding and secondary hydrocephalus. Most women with achondroplasia need general, rather than spinal or epidural, anesthesia to avoid problems related to spinal stenosis.[9,10] Achondroplastic pregnant women are also at increased risk for respiratory

failure. Cardiovascular events are the main cause of mortality in adults. Cardiovascular complications like Hypertension, Metabolic Syndrome, Ischemic Heart Disease and stroke can occur due to Obstructive Sleep Apnea (OSA). Treatment of OSA with adenotonsillectomy and/or CPAP can improve respiratory abnormalities and decrease respiratory events, and for adults with OSA, can reduce the incidence of long-term complications.[9]

CONCLUSION :-

Achondroplasia increases maternal and fetal obstetric complications; thus requiring prenatal counseling, comprehensive risk evaluation, and multidisciplinary team management of anesthesia, obstetrics and neonatology.

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