### **Case Study: Growth Chart Interpretation for a Newborn with Intrauterine Growth Restriction**

#### **Introduction**

Intrauterine Growth Restriction (IUGR) refers to a condition where a fetus is unable to achieve its genetically determined potential size. This case study illustrates the use of growth charts in diagnosing and managing a newborn with IUGR, focusing on associated challenges such as iron deficiency anemia.

#### **Background**

IUGR can be due to a variety of maternal, fetal, or placental factors and is associated with higher risks of both perinatal morbidity and long-term developmental issues. Early detection and management are crucial for improving outcomes.

#### **Presenting Symptoms**

A newborn, Ayaan, displayed the following characteristics:

* Birth weight below the 10th percentile for gestational age.
* Reduced body measurements including head circumference.

**Investigations**

* Physical examination confirming low weight and length for gestational age
* Ultrasound examinations performed prenatally showing decreased fetal growth rate.
* Placental examination post-delivery indicating placental insufficiency.

#### **Differential Diagnosis**

* **Congenital Infections**: Tested for TORCH infections which returned negative.
* **Genetic Syndromes**: Considered due to small stature, but no dysmorphic features or family history suggesting a specific syndrome.
* **Chromosomal Abnormalities**: Karyotyping was normal, ruling out common chromosomal causes of IUGR.
* **Maternal Factors**: No evidence of substance abuse or severe maternal malnutrition, although there was documented placental insufficiency.

#### **Final Diagnosis**

Intrauterine Growth Restriction secondary to placental insufficiency

**Treatment and Management**

* Routine blood glucose monitoring was done.
* The baby has difficulty in feeding hence orogastric feeding was provided with mothers own milk .
* Lactation counselling was done and the baby was shifted on breast feeding.
* Adequate caloric intake was ensured.
* Close monitoring of growth parameters using standardized growth charts during regular pediatric follow-ups.

#### **Follow-up**

Ayaan was followed up monthly to track growth and development against pediatric growth charts. Over the first year, gradual improvements in growth parameters were observed

**Conclusion**

This case underscores the importance of using growth charts for early identification of IUGR and their monitoring for catch up growth. Regular monitoring and appropriate nutritional and medical interventions are vital to support the health and development of infants with IUGR, demonstrating the practical applications of growth charts in pediatric care.

### **Case Study: Utilizing Growth Charts for Monitoring and Decision-Making in a Child with Suspected Growth Hormone Deficiency**

#### **Introduction**

Growth hormone deficiency (GHD) in children leads to various growth failures visible on standardized growth charts. This case study demonstrates how growth charts play a pivotal role in diagnosing and managing suspected GHD.

**Background**

GHD is characterized by inadequate growth hormone production, affecting children's height and weight gain. Early diagnosis and treatment are essential for optimal growth outcomes.

#### **Presenting Symptoms**

Rohan, a 5-year-old boy, presented with:

* Significantly shorter stature compared to peers.
* Decreased growth velocity on growth charts(<5cm / year)
* No H/o any intracranial tumor, cranial irradiation or head trauma

#### **Investigations**

* Bone age assessment through wrist x-ray, showing delayed bone age compared to chronological age
* IGF-1 and IGFBP3 were found to be moderately low hence Growth Hormone stimulation test was done
* Growth hormone stimulation test showing low levels of serum growth hormone..
* MRI of the pituitary gland to check for structural abnormalities was found to be normal

#### **Differential Diagnosis**

* **Congenital GH deficiency-**normal facies and did not have microphallus,cryptorchidism and no h/o of admission for hypoglycemia
* **Chronic Illness**: Investigated through comprehensive physical examination and medical history, ruled out due to absence of other symptoms.
* **Malnutrition**: Dietary history did not suggest significant nutritional deficits aside from potential iron inadequacy.
* **Primary Hypothyroidism**: Thyroid function tests were normal, excluding thyroid dysfunction as a cause of reduced growth.
* **Celiac Disease**: Considered due to its impact on growth and potential for anemia; however, serologic tests for celiac were negative.

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#### **Final Diagnosis**

Growth Hormone Deficiency

#### **Treatment and Management**

* Initiated treatment with recombinant human growth hormone (rhGH) injections.
* Nutritional counseling to ensure a balanced diet supportive of growth and development.
* Regular monitoring (every 3 months) using growth charts to assess response to therapy and adjustment of treatment as needed.
* ΙGF-1 for "fine-tune" rhGH doses was planned

#### **Follow-up**

Rohan's growth parameters were closely monitored with regular clinic visits every three months. Gradual improvements in growth velocity were noted after initiating rhGH therapy

#### **Conclusion**

This case highlights the critical role of growth charts in diagnosing and managing growth hormone deficiency and iron deficiency anemia. Growth charts are not only diagnostic tools but also essential for monitoring treatment efficacy, aiding in timely and informed decision-making in pediatric growth disorders.