Normal Development and Behaviour

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Ped 474

Growth VS Development

- **Growth:**
  Increase in size of body (or separate parts of it) or difference in proportion

- Growth is not linear; most rapid growth is during the first 2 years and then at puberty.

- Different tissues grow at different times; First 2 years; mostly the CNS

Growth Parameters

- Parameters of average growth: Weight; gain of 20-30 g/day
- Double by 4-5 months of age Triples at 1 year
  Quadruples at 2 years
- Height: increases by 50% in the first year At 2 years reaches 1⁄2 of adult height
- Doubles by 3-4 years Triples by 13 years
- mid-childhood; lymphoid tissue
- puberty; gonads

Development

- Change in function, including those influenced by the emotional and social environment.

Brain Growth

- The brain is smooth at 28 weeks.
  Most of the growth of the brain is outside the uterus.
- The first 2 years of life, the brain increases to up to 80% of adult size (triple to four times).
- It grows by making sulci and gyri which are important to increase the capacity of the brain.
- The brain continues to grow, until by adulthood (18 years) it reaches its largest size.

Brain Development (The first 2 years)

- Number of neurons is fixed in the fetus.
- Growth is by making connections and synapses in which the neurons are myelinated.
- The brain has 2 hemispheres; each area of the brain is specialized in certain cognitive domain e.g. hearing, vision, thinking each one is in a special area)
- Thinking, judgment and cognition is in the frontal lobe.

Child Development

- The skills acquired by children between birth and about 5 years of age.
- Fields of development include:

➢ Gross motor for mobility: the most obvious initial area e.g: rolling, sitting, crawling, walking….

➢ Fine motor and Vision:
grouped together as vision is necessary for fine motor development hand function e.g holding toys, spoon, writing, coloring

Child Development

- Hearing, speech and language:
  Normal speech and language development is dependent on good hearing skills to be able to communicate

- Social, emotional and behavioral: A spectrum of psychological development

- A deficiency in any one skill area can have an impact on other areas and may result in global developmental delay

Child Development

Knowledge of normal growth and development of children is important:

- To help children achieve their maximum potential
- To recognize abnormal deviations from normal pattern to:
- ✓ Refer for further diagnostic work up and management e.g. impairments of hearing and vision must be recognized and treated early
- ✓Act as an entry point for the care and management of children with special needs.

Influences on development

- Child development is the result of an interaction of heredity (which determines the potential of the child, genetic) and the environment of the developing brain.
- In terms of the environment, the child's physical (e.g. food, shelter, vision, hearing, good health) and psychological (e.g. security, role models, opportunities to learn from, play, affection, care, self respect and independence) needs must be met.
- Physical and psychological needs vary according to age
- Development can be impaired if the environment fails to meet the child's needs.

Indications for developmental assessment:

- During immunization visits.
- Difficulty in pregnancy, labor or newborn period and whether it had an effect on the baby.
- Hypoxic symptoms: convulsions or meningitis early in life (first 2 years of life) might affect the growing brain and may lead to cerebral palsy.
- Presence of unusual behavior or physical feature (dysmorphic features)
- Part of routine examination of infant; used to diagnose conditions for which treatment is available (deafness)

Developmental assessment

Normal development is monitored via:

- Parents
- Regular child health surveillance
- Whenever a child is seen by a healthcare professional (brief opportunistic overview)

Developmental Screening

- Knowing the normal spectrum
- History, physical and developmental examination
- Concentrate on each filed of development separately, then assess whether the child is developing at similar rate through each skill field or if one (specific developmental delay) or more (global developmental delay) lag behind
- Lastly, we relate the developmental achievements to the chronological age. If the delay is affecting 2 or more developmental fields it is termed global delay.

Developmental History

- Prenatal (Pregnancy) risk factors:

➢ Maternal infections:
Certain infections affect the mother and the fetus
TORCH; Toxoplasmosis, Rubella, CMV, Herpes virus (Other: Syphilis)

(Screening test, U/S and history of any febrile illness or skin rash during pregnancy)

History

- **Perinatal factors:**

➢Perinatal fetal distress, Hypoxic Ischemic insult

➢ APGAR score (the status of the fetus at birth)
Normal birth: when the baby cries immediately, breathes spontaneously and can take the breast or bottle within the first 24 hours

➢Ability to swallow is a good indication.

History

- **Postnatal development:**

➢ Birth weight and duration of gestation
(preterm babies have different problems than full term babies, they have tendency to have periventricular hemorrhage) Small for gestational age; tend to have hypoglycemia.

➢ Sucking or swallowing difficulties

➢ Fever, lethargy, irritability, CNS infection

➢ Major illnesses:
A congenital heart disease, Congenital liver or renal failure.

History

- Developmental Patterns:
  Accelerated development?
  For example, a child was not able to sit at 6 months but he sat by 8 months. He could not walk by 1 year but walked by 2 years, Accelerated development. So he is delayed but gaining function, might be the result of cerebral palsy
- Loss of the previously acquired developmental skills (Developmental regression) which might indicate neurodegenerative disorder .

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Physical Examination

- Dysmorphic features, craniofacial and lip deformities
  Congenital heart disease
- Skin hyper- or hypo- pigmentations
- Subluxation or dislocation of the hip leads to abnormal gait; wobbling gait, treatable condition.
- Growth parameters:
  Head circumference, plotted on head circumference chart

P/E

Requirements for P/E:

- Stethoscope for the heart and lungs
- Patellar hammer for jerks
- Non-stretch tape for skull circumference + head circumference chart
- Scales for weighing + weight and height chart
- Developmental assessment tools:

➢ To assess child's skills by play and facilitating observer assessment

➢ It allows a quick screening of mobility, hand skills, play, speech and language.

P/E

- One-inch block or cubes
- Blunted end pencil or crayon and paper
- Picture card or book
- Bell for hearing assessment
- A ball, doll.

Developmetnal assessmnet

When the developmental assessment is done:

Newborn
6 weeks
4 months
6 months
1 year
18 months
2 years.

By 2 years most of the brain has grown.

Assessment

For young babies (less than 6 months):

- Prone.
- whether he can raise his head up
  (typically, no head control in child is less than 3 months of age)
- In supine position
  Pull the baby to siting

- Reaction to moving objects or humans, vision

- After 6 months, you give the blocks and assess the language

Assessment

- After 12 months: give blocks, pencil or crayon and paper

Newborns

- On Prone, the pelvis is high, knees are under the abdomen.
- On ventral suspension the head is not in the plane of the body
- The hips are not extended. In the newborns even if you extend the legs it will come back, Why this position/posture? Intrauterine this is his position due to the small area.
- He loses it after 6 weeks of birth.

4 months

- Gross Motor:
  - In the sitting position there is no head lag on pulling to sitting position
- Hand functions start;
  - Reach out for gross objects and brings them to the mouth
- Language:
  - Turns head towards sounds
- Adaptive:
  - They laugh with sound

6 months

- Gross motor: Tripod sit: Sit on the floor, hands forward for support, can’t sit independently leaning on their hands with their backs rounded.
- Rolls from prone to supine position
- Fine motor skills: transfer one cube from one hand to another.
- Language: babbles
- Stanger Anxiety